

**ETHNO-MEDICINAL USES OF NIGHT JASMINE (*NYCTANTHES ARBOUR-TRISTIS*)
BY TRIBAL COMMUNITIES IN RAYAGADA DISTRICT, ODISHA: A CASE STUDY****¹Upendra Prasad Tripathy and ^{2*}Sunil Kumar Bishoyi**¹Pulp & Paper Research Institute, Jaykaypur, Rayagada, Odisha (INDIA), Pin-765017.²Model Degree College, Rayagada, Odisha, India, Pin-765017.***Corresponding Author: Sunil Kumar Bishoyi**

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ABSTRACT

Rayagada one among 30 districts, is situated in the southern part of Odisha. Different climate and habitat of Rayagada district provide suitable condition for existence of plant species. The tribal & village people living in the hilly area of this district use various plants to cure for various diseases. *Nyctanthes arbour-tristis* is a flowering plant widely distributed all over tropical and subtropical regions of Southeast Asia. Again, this plant found in all parts of Odisha. Unselective use of some plants of ethno-medicinal importance has resulted in gradual extinction of them. Proper awareness relating the use of ethno-medicinal plants is necessary among the tribal and other rural people. The present paper deals with ethno-medicinal importance of plant species, *Nyctanthes arbour-tristis* (NAT) of family Oleaceae. The various parts of plant such as fruit, seeds, flowers, barks, roots and leaves have significant phytochemicals hence have some medicinal value for treatment of various diseases. Phytochemicals like β -Sitosterol, nycnanthic Acid, Olenoic Acid, Ascorbic Acid, Saponins, Flavonoids, Anntannins and many glycosides like D-mannitol, Astragaline, Nicotiflorine, and Flavinglycosides present in various part of the plant which have significant antiviral, antifungal, anti-malarial, anti-bacterial, anti-inflammatory, antioxidant activities. Local permanent tribal people of this region use *Nyctanthes arbour-tristis* for different diseases such as malarial fever, intermittent fever, constipation, Asthma, stomach disorder, spleen enlargement etc.

KEYWORDS: Ethanomedicine, Night Jasmine, *Nyctanthes arbour-tristis*, Phytoconstituents.**INTRODUCTION**

The use of traditional herbal medicine for treatment of common diseases has great relevance today because of high cost of medical care. Again the use of synthetic drugs has a significant side effect. Hence in the modern scenario people like to follow herbal medicine for common diseases. Among the 30 district of odisha, Rayagada is situated at the southern part with natural beauty having 70% of tribal people. *Nyctanthes arbour-tristis* popularly known Night Jasmine in India is famous for its medicinal quality from ancient time. Many herbs are used by the tribal and village community for medicine. The various part of the plant like fruits, leaves, seeds, flowers, barks and stem have important phytochemicals and have some medicinal uses for cure of some diseases like cold, fever, dysentery, joint pain, asthma, spleen enlargement, constipation and stomach disorder etc. Due to cost effectiveness, the tribal and rural population doesn't have available for modern medicine. *Nyctantus arbour-tristis* is popularly known as "Night Jasmine" due to flowers produce a very strong and pleasant fragrance during whole night.^[1,2,3,4] The flowers are falling after midnight and by the day break, the plant appears dull. Haque et.al.(2019) reported that

the extracts obtained from the flower of *Nyctanthes arbour-tristis* contains five fatty acids like palmitic(44.15%), stearic(19.34%), arachidic(15.06%), behenic(9.77%) and lignoceric(11.69%) acids. The dichloromethane extracts and ethyl acetate extracts of flower shows significant antibacterial activities.^[5] The bright orange corolla tubes of the flowers contains *Nyctanthes* which is identical with α -Crocetin.^[6] Vajravijayanet.al.(2013) reported that *Nyctanthes arbour-tristis* seed extracts with hexane, ethyl acetate and methanol shows anti-inflammatory, antioxidant and free radical scavenging activities.^[7] The Taxonomical classification of Night Jasmine plant has as follows.

- Kingdom : Plantae
- Division : Magnoliophyta
- Class: Magnoliopsida
- Order : Lamiales
- Famil : Oleaceae
- Genus: *Nyctanthes*
- Species : *arbour-tristis*

The genus name "Nyctanthes" has been coined from two Greek words "Nykhta" (Night) and "anthos" (flower). The species name "arbour-tritis" meaning "the sad tree"

is derived from dull looks of the tree during daytime.^[8] *Nyctanthes arbour-tritis* is a most useful flowering plant. It is found in South Asia and in India, it is found in Himalayan region, West Jammu & Kashmir, West Bengal and Odisha. This tree grows well in a wide variety of loamy soils with pH 5.6-7.5. The plant requires normal sunlight and water regularly but require over watering.^[9] The plant is popularly known as.

- Night flowering Jasmine, Coral Jasmine in English.
- Sefali, Jharsefali, Ganga-siuli in Odia.
- Harisinghar, Seoli in Hindi.
- Paariijaatham in Telugu.
- Jayaparvati in Gujarati.
- Goli, Harsing, Parijata in Kannada.
- Parijata, Parijatah, Parijataka, Sephalika in Sanskrit.
- Manjhapu, Pavala-malligal in Tamil.

Borah et.al. (2009) reported that by taking the stem bark extract 100ml of Night jasmine (*Nyctanthes arbortristis*) in empty stomach on morning for seven days beneficial towards diabetes. But this extract cannot be given to diabetic patient having heart problem.^[10] *Dhinakaran et.al.*(2016) reported that the ethanol extract of leaf, flower and stem shows anti oxidant and anti-inflammatory activity.^[11] Bhattacharyya et. al. (2016) reported that by giving 5-6 young leaves pasted with a pinch of piper nigrum fruit-powder for 5 to 7 days in empty stomach cures Malaria.^[12] Rayagada is situated in the state of Odisha, India having longitude 83°25' and latitude 19°10' with tropical climate. The average annual temperature of Rayagada is 25.5°C. The Rayagada district map is shown in figure-1 and the plant Parts of *Nyctanthes arbour-tristis* shoot & leaves, flower & seeds are shown in figure-2.

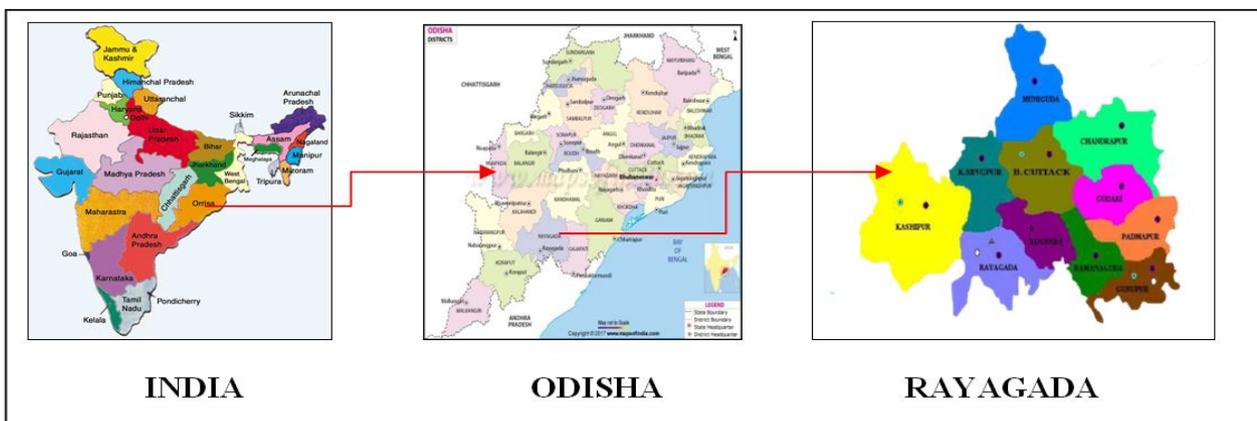


Figure-1: Rayagada District Map in Odisha & India.

BOTANICAL DESCRIPTION

Nyctanthes arbortristis is a large shrub or a small deciduous tree grows up to 10m tall, with quadrangular branches and grey or greenish-white rough bark.^[13]

Leaves: Leaves are simple petiolate and exstipulate, opposite, 3-10 by 4-6.3 cm ovate, acute, short bulbous hairs rounded petiole 6cm long hairy.

Flowers: The flowers are originated at the tips of branches in the axils of leaves and are small in clusters of

5-7 fragrant strongly, peduncles of 4 angled, slender, 6-8 mm long calyx, narrow campanulate, hairy glabrous inside, lobed, ciliated and corolla are glabrous more than 13mm, 6-8mm long tube, orange colour, corolla white lobes with an orange red centre. Flowering occurs from July to October.

Fruits: Fruits are brown heart shaped to round capsule with a single seed. It grows in loamy soil. The plants need to be watered regularly.

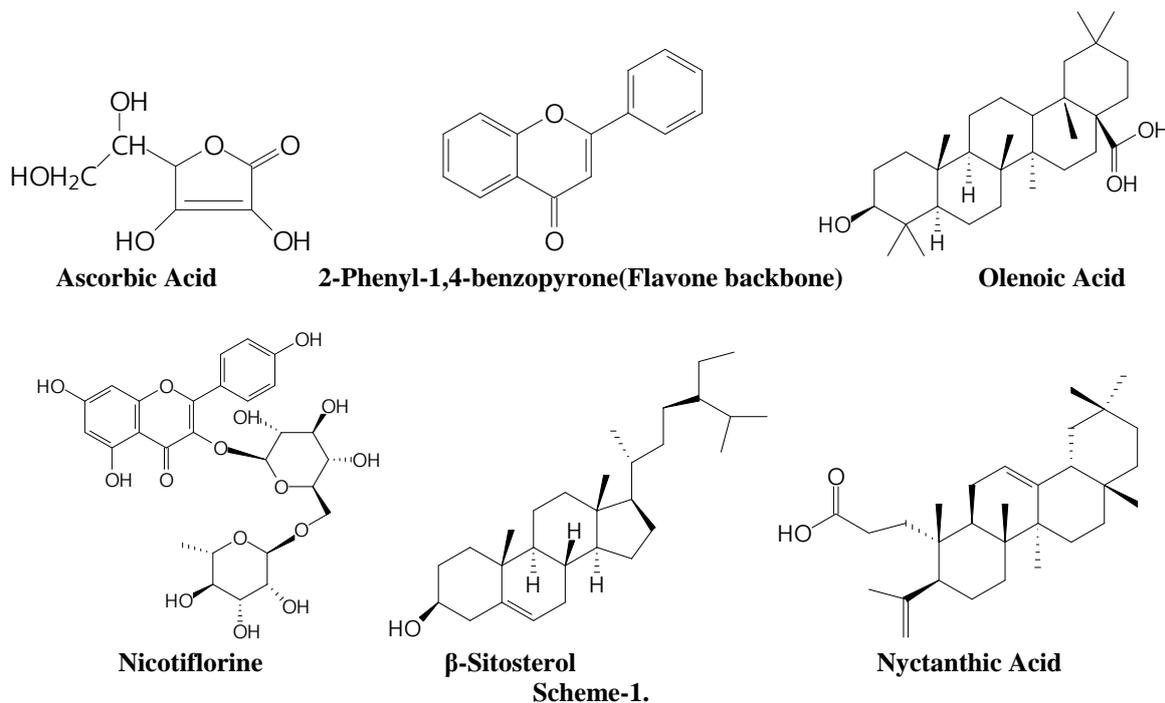


Figure-2: Parts of *Nyctanthes arbour-tristis* Shoot & leaves, flower & Seeds.

PHYTOCONSTITUENTS

High amount of Alkaloids found in leaves & roots of the plant *Nyctanthes arbour-tristis*. The whole plant and leaves contains many useful phytochemicals like β -Sitosterol, nyctanthic Acid, Oleonic Acid, Ascorbic

Acid, Saponins, Flavonoids, Anntannins and many glycosides like D-mannitol, Astragaline, Nicotiflorine, and Flavinglycosides. The chemical structures of phytoconstituents are presented scheme-1.



FIELD SURVEY

The field study of the Rayagada area was carried out during the period of July 2019 to Dec-2021. The field survey was conducted with the help of selected local experienced old persons and herbal medicine practitioners. The herbal medicine practitioners were interviewed regarding the ethno-medicinal uses of plants. An instance of questioning was made in different villages of the information gathered on ethno-medicinal uses of the plant. The collected plant species were verified and identified by consulting standard regional floras.^[14-17] The botanical nomenclature has been checked with widely accepted website.^[18] Out of the collected plant species, one important plant, *Nyctanthes arbour-tristis* of family oleaceae has been mentioned with ethno-medicinal uses. The data of ethno-medicinal plants recorded from rural a tribal people has been compared with some scientific literatures.^[19-20] Voucher specimens are deposited in the Herbarium, Department of Botany, Model Degree College, Rayagada.

ETHNOMEDICINAL USES AND PHARMACOLOGICAL ACTIVITIES

a) Ethno-medicinal uses

Nyctanthes arbour-tristis is an identified and mostly used plant in medicinal field. *Nyctanthes* plant has used for various central nervous system (Viz., Local Anaesthetic, hypnotic, tranquillizing) and Anti-histaminic, immunodulatory activities. *Nyctanthes* plant used in many aliments like fever, enlargement of the spleen,

malaria, blood dysentery, cough and gastritis. Juices of leaves is used as digestive, Antidote to reptiles venom. Seeds are used to cure infection of scalp piles and skin diseases. Powdered stem bark is used in Rheumatic joint pain, oil is used for eye pain and with *Arjuna* bark it is rubbed on the body in internal injury. Flowers are used in ophthalmic purposes, and bitter, stomachic, carminative. Barks are traditionally used in Anti-diarrheal and anti-dysenteric.^[21-23]

b) Pharmacological Activities

1. Anti-diabetic Activity

The root of *Nyctanthes arbour-tristis* contains methanol. This methanol uses for Anti-diabetic activity. *N. arbortristis* roots were more effective in reducing the blood glucose level compare to the standard drug. It reduces blood glucose level after 7 days at the 500mg/kg in rats compare with standard drug.^[24]

2. Anti-malarial Activity

The clinical study of *Nyctanthes arbour-tristis* of malaria was performed on 200 patients. The fresh paste of medium sized 5 leaves of *N. arbortristis* thrice a day for 7-10 day has cured the disease in 168(84%) patients within 7 days. Other 25 patients were cured by 10 days while the remaining 7 patients didn't respond to the treatment.^[25]

3. Anti-filarial Activity

A pure compound and the chloroform extract of the flowers isolated from *Nyctanthes arbour-tristis* plant exhibit larvicidal activity against *Culex quinquefasciatus*, a common filarial vector.^[26]

4. Anti-allergy Activity

Nyctanthes arbour-tristis leaves contain alcoholic extract. This leaves protects against the development of Asphyxia. *Arbortistoside-A* and *Arbortistoside-C* are present in *Nyctanthes arbour-tristis* were reported to be anti-allergic.

5. Anti-inflammatory activity

The leaves of *Nyctanthes arbour-tristis* contain Alcoholic extract and were reported to have acetate Anti-inflammatory activity. *N. arbourtristis* is also found to inhibit the inflammation produced by immunological

methods that are Freund's adjuvant arthritis and purified tuberculin reaction.

6. Anti-cancer Activity

A high degree of against human breast cancer cell lines was observed with *N. arbourtristis* dried fruit methanol. The phytochemical isolated from dried fruit methanol of *N. arbourtristis* are glycosides, tannins, steroid and phenols and predicted to be responsible for this Anti-cancer Activity.

7. Anti-tryptaminergic Activity and Antihistaminic Activity

The leaves of *N. arbourtristis* contain alcoholic extract. This leaves protect against histamine aerosol-induced asphyxia in guinea pig. The *arbortristosid-A* and *arbortristosid* reported to be Antiallergic.

Table 1: Chemical constituents present in different parts of Night jasmine and their biological activities.

Plant Part	Chemical Constituents	Biological activity
Leaves	D-mannitol, β -sitosterole, Flavanoglycosides, Astragaline, Nicotiflorin, Oleanolic acid, Nyctanthic acid, Tannic acid, Ascorbic acid, Methyl salicylate, Carotene, Friedeline, Lupeol, Mannitol, Glucose and Fructose, Iridoid glycosides, Benzoic acid	Antibacterial, Anthelmintic, Anti-inflammatory, Hepatoprotective, Immunopotential, Anti-pyretic, Antioxidant, Antifungal
Flowers	Nyctanthin, d-mannitol, Tannin, Glucose, Carotenoid, Glycosides,	Diuretic, Ant-bilious, Antioxidant, Anti-inflammatory, Sedative, Antifilarial
Seeds	Arbortristoside A&B, Glycerides of linoleic oleic, lignoceric, stearic, palmitic and myristic acids, nyctanthic acid, 3,4-secotriterpene acid.	Antibacterial, Antifungal, Antileishmanial, Immunomodulatory
Bark	Glycosides and Alkaloids	Anti-microbial,
Stem	Glycoside-naringenin-4'-O- β -glucapyranosyl- α -xylopyranoside and β -sitosterol	Antipyretic, Antioxidant

ETHNOMEDICINAL USE OF NYCTANTHES REPORTED FOR RAYAGADA AREA

Seed paste is applied over the affected part to remove dandruff and lice. Seed paste is taken with water 2 times daily for treatment of constipation and stomach disorder. Leaf (15 numbers) paste is taken with a glass of Lukewarm water and is taken 2-3 times daily for treatment of sciatica. Leaf extract along with lime water is taken once daily in empty stomach for treatment of Anti-helmintic disease. Leaf (5 numbers) extract and Rhizome of *Zingiber officinale* extract are mixed together and take 3 times daily for 7 days for treatment of intermittent fever. Leaf of *Nyctanthes* plant, leaf of *Achyranthes aspera* and leaf of *Hygrophila auriculata* are crushed together and taken with cow's milk 2-3 time daily for treatment of spleen enlargement. Leaf (5-6 numbers) and one leaf of piper betle are crushed together and taken thrice daily for treatment of Asthma and Cough. Leaf paste is used twice daily over the affected part regularly for using against bed sores.

LOCAL HERBAL MEDICINE PRACTITIONERS VIEW

The personal view of local herbal medicine practitioners are taken and recorded, Mrs. Ratnamala Mishra of 43 year age from Ambadala (Rayagada), Mr. Kollunu Apa Rao of 76 age from Amlabhata (Rayagada) & Mrs. Rukuni Gouda of 80 years age from Paikapada (Rayagada) advising to use green leaves with black pepper for different fever patients. Mrs. Janaki Behera of 85 years age from Ambadala (Rayagada) is advising to use fresh paste of crushed seeds for treatment of piles. Mr. Bidyadhar Behera of Bissamcuttack (Rayagada) & Mr. Trilochan Majhi of Podapadi of Kashipur (Rayagada) are suggesting the paste of green leaves for dermalogical problems. Again, Mr. Silla Damburu having age 70 years, of village Jangadapadar of Kolnara block (Rayagada), Mr. Sudarshana Behera of Podapadi of Kashipur (Rayagada) and Mr. Loknath Dalei of Kashipur (Rayagada) suggesting to use the young leaves for gynaecological problems of female.

CONCLUSION

Nyctanthes arbor-tristis is important medicinal plant and medicinal properties like Antifungal, hypoglycaemic, Antimalarial, Cytotoxic, Analgesic, Antioxidant and Wound-healing effects. In addition *Nyctanthes arbor-tristis* is as an ornamental plant whose leaves especially used for malaria fever and it is most popular for the fragrant flowers. Further research work and clinical trials need to be done to establish the above mentioned effects in human beings. During study it has been observed that the leaves are mostly used in comparison to other plant parts.

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