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Ethnobotanical studies of Harsingar (*Nyctanthes arbor-tristis* L.) of Agra region: A traditional medicinal plant

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Abstract
Nyctanthes arbor-tristis is a small shrub tree belongs to Oleaceae family. It is a highly traditional medicinal plant known as Harsingar or Night Jasmine. Its native to India but distributed in Himalayan and Nepal region. It is found as ornamental plant in Indian garden and temple side. Ethnobotanical survey and informations about the plant, the five villages of Agra city nearby Yamuna bank followed by Runakta to Poiya Ghat were selected for observation. Ethnobotanical observations were made on plant of *Nyctanthes arbor-tristis* and major discussed by five villager rural people like Farmer, Vaidhya, Hakim and Medicine men of the district of Agra regarding, medicines, socio-religious beliefs and the material culture. Household survey was conducted on a random basis for obtain information on people's perceptions on conservation, amount of availability and uses of *N. arbor-tristis*. A structured interview method followed by set of questions was used for the study. The flowers leaves, fruits, bark and seed of this plant is extensively used in Ayurvedic medicine for the treatment of various diseases by local people of Agra region. Therefore, it should reproduced and promoted cultivation in rural as well in urban areas.

Keywords: ethnobotany, medicinal knowledge, *Nyctanthes arbor-tristis*, Oleaceae, traditional healers

1. Introduction
Medicinal plants are gifts of nature to cure unlimited number of diseases amid human beings. WHO documented that the 25% of ongoing medicines developed from the plants which used traditionally and lead to discovery of 75% of herbal drugs (Mian Ying *et al.,* 2002) [6]. Approximately 21,000 species of plant used for their medicinal purpose in all over the world (WHO 2002) [14]. A great deal of information about the traditional uses of plants is still intact with the tribals. But the native healers are generally resistant to accurately contribution their knowledge to outsiders (Acharya *et al.,* 2008) [1]. Ethnobotany deal with the study of how the people of a specific culture and region prepare and use of domestic plants. Ethnobotanical studies range across space and time, from archaeological investigations of the role of plants in ancient civilizations to the bioengineering of new crops (Joshi and Joshi, 2000) [4]. The plants in their environs play an important role in their socio-economic as well as cultural and traditional aspects too (Shrestha, 1988) [10].
Nyctanthes arbor-tristis belongs to Oleaceae family. The specific name *Nyctanthes* indicate “Night Flowering” (Shrivastava and Bharadwaj, 2018) [11]. It is a traditional medicinal plant commonly known as night jasmine or coral jasmine (Kiew *et al*., 1984) [5]. *Arbor-tristis* name indicates "the sad tree" is apparently dull looks of tree during the daytime (Suresh *et al.,* 2010) [12]. Its cultivated in temperate and semitropical region over the world in many developing countries and native to the India and subtropical Himalayas of Nepal. It is also popularized in Southern India and tropical, subtropical parts of South East Asian countries (Bhalakiya and Modi, 2019) [2]. Various parts of *N. arbor-tristis* like flowers, leaves, seeds, fruits and bark have a great medicinal value as antimicrobacterial, antiinflammatory, anathematic, Antimalarial, Antidiabetic, Antiallergy, Antioxidant activity which extensively used in tribal and herbal medicine for the medication of many diseases such as sciatica, rheumatism, chronic fever, asthma, internal worm infections, inflammations, dyspepsia, dermatopathy, bronchitis, dysentery, ulcer, cough, skin diseases, and fever etc (Bhalakiya and Modi, 2019; Gupta *et al*., 2006; Shrivastava and Bharadwaj, 2018) [2, 3, 11].
In the light of these enumerated facts, the present study was carried out on *N. arbor-tristis* to evaluate the Ethanobotanical properties in the climatic conditions of Agra region.

2. Materials and Methods
2.1 Study Area
Agra is placed in the bank of Yamuna river state of Uttar Pradesh. Topographically the Agra occupies most of the plain area. The plants, undertaken for the study are from the villages of Yamuna bank followed by Runakta to Poiya Ghat (10 to 20 km area of bank of river Yamuna). The information was collected from major inhabitants in these villages (Fig. 1).

Fig 1: Map showing the study area of N. *arbor-tristis* of Agra District (Runkata to Poiya)

2.2 Tools of collecting information

The total of 4 weeks was spent for the field work and visited frequently during the study period. The household inspection was conducted on a random basis to obtain knowledge and information on people's perceptions on conservation, availability and method of uses of plant parts. Major issues of Ethno botany were discussed with the members of these households like the uses, economic value, amount of availability, problems in conservation, prospects and enterprising etc. Some housewives, faith healers, farmers and old people were interviewed using a set of questions. The teachers and medicine men will be consulted using on unstructured interview that was basically found on the history, culture, tradition, socio-economic and present condition of the study.

2.3 Collection and storage of plant

The leaves of plant were collected during the survey of various places of Agra District. The leaf devoid of contamination was carefully cut with cutter and kept in polythene bags which were subsequently sealed. Specimens collected were carry to the laboratory and saved in a refrigerator. The stored specimens were washed with tap water followed by sterilized distilled water and extracted within 24 hours of collection. The plant materials were collected during the leaf fall or in the spring.

3. Result and Discussion

The observations on Ethno botanical studies on *N. arbor-tristis* growing at five villages of Agra district viz., Surkuti, Runakta, Mau, Poiya Ghat, Kakretha and Manoharpur. These observations were recorded on the basis of interview of villagers, Vaidhya, Hakim, Medicine men, local faith healer, mainly concerning their knowledge on food, fodder and medicines taken from the different parts of the plant.

Agra District is located under the semi-arid area therefore, the climatic conditions are more or less similar in the villages. This District does not have rich tribals. However, 65% people are living in the villages, depend on wild as well as cultivated plants for their welfare. Agra district is found to possess a very rich Ethno botanical knowledge on *N. arbor-tristis*. Even to this date, they have been making use of this plant species for various purposes such as medicine, ornaments, worship, timber and euthenics purpose etc.

Taxonomical classification: Vernacular classification

Kingdom: Plantae
Tamil: Pavizhamalli
Division: Magnoliophyta
Telugu: Kapilanagadustu
Class: Magnoliopsida
Bengali: Shefali
Order: Lamiales
Malayalam: Paarijatam
Family: Oleaceae
Gujrati: Jayaparvati
Genus: Nyctanthes
English: Coral Jasmine
Species: arbor-tristis
Sanskrit: Parijat
Binomial name: *Nyctanthes arbor-tristis*
Common Name: Harsingar, Night jasmine

3.1 Morphological description

Harsingar (*Nyctanthes arbor-tristis*) well known as Night jasmine or Parijat a large shrub or small tree up to 10m tall (Fig. 1A). It is cultivated in garden, road side and near the temples for ornamental purpose in Agra. The flowers are white colored with a five to eight lobed corolla having orange red color in the center (Fig. 1B). The flowers are produced in clusters of two to seven together. The flowers were opened at dusk and finishing at early morning. Thus, making a carpet of flowers in the morning (Fig. 1C). The leaves of Harsingar are simple, 6-12 cm long, opposite and 2-6.5 cm broad entire margin (Fig. 1D). The fruit is a greenish and brown on drying, flat, heart shaped to round capsule with 2.0 cm in diameter, having two sections and each section containing a single seed (Fig. 1E). The bark is rough and peeling bark, flaky grey or greenish (Fig. 1F).

3.2 Plant Parts and their uses

Harsingar (*N. arbor-tristis*.) is a holy tree of Braj region, since the time of Lord Krishna and also known as Parijat. Therefore, village people worship this tree and use the whole plant as well as their morphological parts for curing

various diseases. Some important informations are collected from the rural people about the uses of morphological parts of *N. arbor-tristis*.

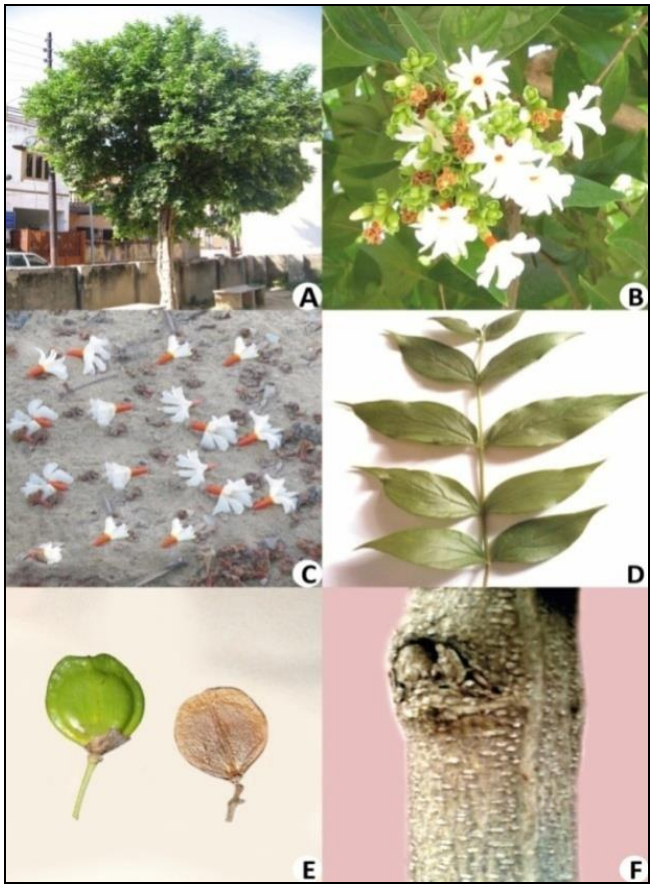

Fig 2: Different parts of *N.arbor-tristis*, A: Entire plant, B: Flowers and Buds, C: Fallen Flowers D: Leaves E: Fruit F: Bark

1. Uses of flowers

For bathing: The fresh flowers of *N. arbor-tristis* (100-200 gm) are added in one bucket of water in the evening and used for bathing in the next morning this helps to cure the skin diseases and keeps the skin smooth and free from all the skin troubles.

For headache: The pedicel of fresh flowers is used for making paste after mixing it with sandal powder and is applied on forehead, which is used as a medicine for curing the headache.

For worship: Hindus use this flower to worship Lord Krishna. It is believed that this tree brought from the Swargloka to Earth for Satyabhama (wife of Lord Krishna).

For hair growth: Flowers are also useful for hair growth. 50g of fresh flowers of *N. arbor-tristis* are crushed to make paste with multani mitti. This paste may be used weekly for long and strong hair.

For coloring: According to villagers, the dye of orange color pick up from the corolla tube of flower, which is utilized for coloring the cotton and silk.

2. Uses of Leaves

Used in treatment of ring worm: The paste (aqueous) of leaves is externally used in treatment of skin related disease specifically in treatment of ring worm. The Fresh boiled leaves of *N. arbor-tristis* with mustard oil can be used in treatment of ring worm.

Used in treatment of intestinal worm: The combination of leaf juice and salt is used in the treatment of intestinal worms. Normally, the seven regular doses can flush out all the worms effectively.

Used in treatment of dry cough: The leaf juice with honey is useful in the treatment of dry cough and chronic fevers.

3. Uses of Seed

Bavasir (Piles): Daily one seed of Harsingar with warm water is recommended for treatment of piles. This treatment is continued till three months to cure this disease. The seeds are crushed and aqueous paste is prepared. The piles patients are advised to apply fresh paste externally use on piles, along with the internal use of seeds. This treatment is traditionally very simple and more effective.

Obstinate fever: Fresh seeds of *N. arbor-tristis* are collected and break to make powder and mix with water to compose a tonic, which is used two times in a day to cure obstinate fever.

Skin Diseases: The seeds (100 gm) are crushed to make powder. This seed powder is a good remedy for skin diseases.

Used for Dandruff: The decoction of Parijat seeds are used as hair tonic and one should wash the hair daily in order to get rid from dandruff and lice.

4. Uses of Stem bark

Used in Cough and cold: The 100-gm bark of the plant is boiled with water to make decoction. This decoction is used twice a day regularly for seven days.

Used in treatment of Malaria: The stem bark is pounded with *Zingiber officinales* and *Piper longum* is boiled in fresh water then obtain liquid is taken for one to two days for the treatment of malaria.

Used in treatment of fractured bones: 100 gm of stem bark of this plant is used to make a paste with deshi ghee and is applied on the damage body part to treat internal swelling and for fractured bones.

The present observations conducted to traditional medicinal uses of *N. arbor-tristis* common among the natives. The flowers are used for bathing, worship, good hair growth, coloring, medicine and various skin diseases. It is also used to make ornaments and necklaces. The flower is having unique capacities to purify the water. Hindus use the flowers to worship Lord Krishna. Same results were found by Sasmal *et al*. (2007) [9], according to them, the flowers used as carminative, stomachic, astringent to bowel, expectorant, antibilious, hair tonic and in the medication of many skin diseases and ophthalmic purposes. Paarakh *et al.* (2009) [8] also resulted made the ethnobotanical investigation on flowers of *Jasminum grandiflorum* L. (Oleaceae). They reported that the flowers are used in stomatopathy, odontopathy, cephalopathy, ophthalmopathy leprosy, skin diseases, strangury, pruritis, dysmenorrhoea, ulcers, as refrigerant, ophthalmic and vitiated conditions of pitta. Bhalakiya and Modi (2019) [2] studied that the flowers are used in India, Malaysia and Indonesia to provoke menstruation. Some elderly Sri Lankan Buddhist monks the flowers of Harsingar is used as a sedative with hot combination and treatment scabies and other skin diseases.

The leaves indicated from present observations that they are used for various purposes. The medicinal use of leaves are in dry cough, chronic fever, laxative, diaphoretic and diuretic. The leaves are sometimes used for polishing wood

and ivory. The paste (aqueous) of leaves is externally used in treatment of skin related troubles specifically in treatment of ring worm. Leaf juice of Harsingar is bitter acrid and very useful in treatment of fevers. Tuntiwachwuttiku *et al*. (2003) [13] reported that the leaves of Harsingar are greatly used in herbal medicine for treat of many diseases such as rheumatism, sciatica, chronic fever and internal worm infections and as a diaphoretic, luxative, diuretic and enlargement of spleen. Nawaz *et al*. (2009) [7] evaluated on the Ethnobotanicals survey of *N. arbor-tristis* (Oleaceae). According to them, the leaf juice mix with honey is used for the medication of cough and Leaves paste with honey is useful for treatment of high blood pressure, fever and diabetes. Bhalakiya and Modi (2019) [2] reported that the Leaves of *N. arbor-tristis* are mostly used for treated for various disease such as diabetes, liver disorders, chronic fever, piles, diaphoretic, diuretic and internal worm infections.

The Ethnobotanical survey confirms that the seeds of *N. arbor-tristis* are used in curing various diseases in Agra region. Paarakh *et al*., (2009) [8] evaluated the seeds oil applied externally is used to soften and smooth the skin, for cancer, heart diseases, and a variety of other ill. Aroma therapists believe Jasmine seeds oil can be useful as a reputation as an intoxicant is legendary. The seed powder is used to skin diseases and cure infections of scalp pile (Sasmal *et al*., 2007) [9].

The present observations on the stem and bark they are mostly used as tonic for cough, treatment of malaria, broken bones and Paralysis. The wood (Stem) sometimes used for boarding, fuel and Havan in Agra region. Suresh *et al*. (2010) [12] reported antidiabetic activity of ethanolic extract in stem and bark of *N. arbor-tristis* L. According to them, traditionally stem and bark powdered of Harsingar is given in joint pain, malaria, snakebite and bronchitis and also used as an expectorant. Sasmal *et al*. (2007) [9] focused their studies on stem bark. According to them, the stem and bark used in Orissa state for treatment of malaria

4. Conclusion

The present work was undertaken to evaluate the Ethnobotanical observation of *Nyctanthes arbor-tristis* L. This medicinal plant exists a rich flora in the villages of Agra District with great socially economic and medicinal importance. The plant used in Ethno medicine may be further studied and evaluated for their biological activity by modern techniques. The documentation and use of indigenous knowledge as it is vital for safeguarding plant. Therefore, there is an necessary need to document the traditional knowledge associated with these resources. On the basis of present study it is concluded that the *N. arbor-tristis* is a medicinally important tree. It has various Ethnobotanical properties which provides knowledge on reproduction, conservation, cultivation and utilization as natural medicine by rural and urban people of Agra District.

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