

Medicinal Uses of Raat ki Rani (*Cestrum Nocturnum* L.): An Anukta Dravya

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Abstract

In Ayurveda, plants have been used for treatment of various diseases. Those drugs that are not mentioned in Ayurvedic Pharmacopeia are known as Extrapharmacopeial drugs. *Cestrum nocturnum* L. is categorized in Extrapharmacopeial drug section in Ayurvedic Pharmacopeia. It is commonly known as Raat ki Rani in Hindi and Queen of the Night in English. This is a unique plant that belongs to the Solanaceae family that blooms at night and exudes fragrance. It is used in traditional and folklore practices for the treatment of various digestive, urinary and gastrointestinal system related diseases because of its antibacterial, antifungal, antidiabetic and analgesic properties. Various extracts of the plant can be used for healing the wounds, inhibition of malignant growth and tumours.

Keywords: *Cestrum Nocturnum* L.; Extrapharmacopeial; Raat ki rani.

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Introduction

In rural India, 65% of the population use medicinal plants to help meet their primary health care needs [1]. Over 70% of the people of India, which is around 1.1 billion population, still use these Non-Allopathic systems of medicine or Complementary and Alternative system of medicine [2]. Ayurveda, Yoga, Unani, Siddha, Homeopathy and Naturopathy constitutes Complementary and Alternative system of Medicine that have used plants as medicines, for thousands of years and continue to use various kinds of herbs and herbal drugs [3]. Among these traditional and alternative systems of health, Ayurveda has been prevalent for over three thousand years. Around seven hundred plants have been mentioned in Ayurveda that can

be used as medicines [4]. The drugs that are not mentioned in Ayurvedic pharmacopoeia (A.P.I) are known as Extrapharmacopeial drugs. Among them, Raat ki Rami (*Cestrum nocturnum* L.) is one such plant.



Fig. 1:



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Cestrum nocturnum is commonly known as Raat ki Rani (Queen of the Night), which blooms at night and has a strong fragrance. It can reproduce vegetatively or through seeds. When ingested by livestock, it has proved fatal and poisonous. In humans, ingestion of this plant has produced hay fever like symptoms [5]. Even the scent of this plant is known to produce severe allergic reactions in some individuals [6].

Common Names

Raat ki rani in Hindi, Hasna Hana in Bengali, Queen of the Night in English, Thabal Lei in Manipuri, Raatrani in Marathi, and Rat Ki Rani in Konkani [7].

Distribution

Native Range: Tropical America: Mexico, Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama and Caribbean: Cuba [8]

Plant description [9]

Shrubs erect or sprawling, 1-3 m tall; young growth puberulent, glabrescent. Branches slender. Petiole 0.8-2 cm; leaf blade oblong-ovate or oblong-lanceolate, 6-15 × 2-4.5 cm, entire. Inflorescences drooping, many-flowered, axillary or terminal racemose panicles, 7-10 cm. Flowers strongly night scented. Pedicel 1-5 mm. Calyx campanulate, 2-3 × 1-1.5 mm; lobes deltoid, 0.5-0.8 mm. Corolla greenish or whitish yellow, 1.5-2.5 cm, tube slightly contracted at throat, lobes 3-4 mm. Filaments with dentate appendages, usually puberulent at point of insertion. Ovary about 1 mm. Berry white, juicy, oblong or globose, 6-10 × 4-10 mm. Seeds 1-5, ellipsoid, 3.5-4.5 mm.

Taxonomical classification [10]

- Kingdom: Plantae
- Class: Equisetopsida C. Agardh
- Subclass: Magnoliidae Novák ex Takht.
- Superorder: Asteranae Takht.
- Order: Solanales Juss. Ex. Bercht. & J. Presl
- Family: Solanaceae Juss.
- Genus: *Cestrum* L.
- Species: *Cestrum nocturnum* L.

Varieties:

- *Cestrum nocturnum* var. *mexicanum* O.E. Schulz
- *Cestrum nocturnum* var. *pubescens* Dunal
- *Cestrum nocturnum* var. *tinctorium* M. Gómez

Part Used

Leaf [11], aerial parts [12]

Phytoconstituents

The crude form and fractions of the plant contains various phytochemical chemical groups like glycosides, alkaloids, saponins, phenols, flavonoids, sterols and tannins [13]. The methanolic extract contains steroidal saponin named nocturnoside A, in leaves that has been characterized as 3-O-[beta-D-glucopyranosyl (1----3)-beta-D-glucopyranosyl (1----2)-beta-D-glucopyranosyl((3----1)-beta-D-xylopyranosyl) (1----4)-beta-D-galactopyranosyl) (25R)-spirost-5-ene-2 alpha, 3 beta-diol through ¹³C NMR spectroscopy [14]. The mature and fresh leaf extract of n-hexane containing thin layer epicuticular waxes contains 17 long chain alkanes, Hentriacontane (n-C(31)) as the major n-alkane, while nonadecane (n-C(19)), the least abundant component [15].

Folklore Uses

It is used in heart diseases and spasms [16]. The extract of aerial parts is spasmolytic, hypotensive and diuretic [17]. The plant has been used as a good drug for treating digestive diseases in traditional Chinese medicine [18].

Medicinal Uses

The crude methanol extract of the whole plant of *Cestrum nocturnum* L. and its subsequent fractions showed marked antibacterial activity against *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Bacillus subtilis*, *Escherichia coli* and *Shigella flexneri* with the exception of *Salmonella typhi* among the tested samples. The crude extracts and fractions were also found to be susceptible to *Candida* species and *Microsporium canis* [19].

The ethanolic extract of *Cestrum nocturnum* L. leaves has a concentration dependent wound healing effect which was prepared as an ointment. It has high rate of wound contraction, decrease

in the period for epithelialisation, elevated hydroxyproline content in animals [20].

The n-butanol and polysaccharides extracts of *Cestrum nocturnum* L. is able to inhibit tumour growth and prolong the lifetime of the tumour-bearing mice in a dose-dependent pattern [21].

The decoction of dry leaves powder of the plant has analgesic activity through peripheral action mechanism and psychoactive activity. It did not show any anti-convulsing activity [22].

It also has cytotoxic activity against the human oral squamous cell carcinoma (HSC-2) cells along with normal human gingival fibroblasts [23].

The Green synthesized silver nanoparticles prepared with *Cestrum nocturnum* L. has strong antioxidant activity along with antibacterial activity. This activity might be suggested due to the presence of bioactive molecules on the surface of silver nanoparticles, with that of *Cestrum nocturnum* L. [24].

In an Invivostudy in Wistar rats, the hydro alcoholic extract of *Cestrum nocturnum* leaves has demonstrated promising result in the treatment of diabetes [25].

The cell line studies shows that it has very good antitumor effects by inducing damage to the cancer cell DNA and inhibiting the activity of topoisomerase II and low immune toxicity [26].

Conclusion

It is a cosmopolitan plant belonging to the Solanaceae family that blooms at night and imparts a pleasant fragrance. The plant is an Extrapharmacopeial for Ayurveda system of medicine. But it has been in use in Chinese traditional medicine and folklore practices. The folklore uses of this plant are in treatment of various heart diseases, spasms, hypertension, urine retention and various digestive diseases. It is poisonous to livestock and produces hay fever like symptoms in humans when ingested orally and cause severe allergic reactions when inhaled.

Various researches studies show its activity as a potent antibacterial, antifungal, antidiabetic and analgesic drug. It can be used for wound healing, tumour inhibition, killing human oral squamous cell carcinoma and preparation of green silver nanoparticles.

Hence the plant "*Cestrum nocturnum* L." is a very important plant with great medicinal properties. Therefore, the plant needs to be studied

as per Ayurvedic parameters of rasa (taste), guna (properties), virya (potency), vipaka (post-digestive taste) and other parameters and after validation, included in the Ayurvedic pharmacopoeia.

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