

# Review on Medicinal Usefulness of Vitexnugundo Linn

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**Abstract:** *Vitexnugundo* is a perennial plant belonging to family Verbenaceae highly distributed in the Himalayas region in India. The leaves, roots, fruits, and seeds have possessed hepatoprotective, anti-inflammatory, anticancer and antioxidant properties. Generally, it required warm regions, common in waste places around villages, river banks, and most localities in the deciduous forests to grow. The *Vitexnugundo*. The leaves intake reduces the loss of libido and gives relief in increases Vata, Kapha and Pitta. The leaves of *Vitexnugundo* L. possess anti-inflammatory and antioxidant properties, this study has been undertaken to evaluate the effect of *Vitexnugundo* L. in experimentally induced inflammatory bowel disease (IBD) and to find its probable mechanism of action including its antioxidant potential. *nugundo* is a hardy plant, flourishing mainly in the Indian subcontinent. All parts of the plant, from root to fruit, possess a multitude of phytochemical secondary metabolites which impart an unprecedented variety of medicinal uses to the plant. It is interesting to note that a single plant species finds use for treatment of a wide spectrum of health disorders in traditional and folk medicine; some of which have been experimentally validated.

**Keywords:** Phytoconstituent; Alkaloids; Dyspepsia; Rheumatism; Vata; Pitta; Kapha

## I. INTRODUCTION

### 1.1 Medicinal Plant

Vitexnugundo Linn.

Hindi: Shivari, Nirgundi

Malayalam: Vellanocchi, Indranee, Karunacci

Kannada: Nkkilu, Lakkigida, Nekka, Nakkigida

Punjab: Shwari

Bengal: Nirgundi, Nishinda

English: Five leaved chaste tree

Gujarati: Nagod

Marathi: Nirgundi

Sanskrit: Nirgundi

### 1.2 Botanical Description



- **Plant:** It is a branched shrub or tree grown up to 5 meters tall, cylindrical with thin gray bark.
- **Leaves:** Mostly trifoliolate, occasionally Pentafoliolate, palmate compound petiole up to 2.5:3.8 cm long; in trifoliolate the leaflets are lanceolate or narrowly lanceolate, middle leaflet 5 cm to 10 cm long and 1.6:3.2 cm broad with 1 cm to 1.3 cm long petiolule and remaining two sub-sessile; in pentafoliolate leaf inner three leaflets have petiolule and remaining two sub-sessile; on top of surface glabrous and tomentose in bottom with leathery texture.
- **Roots:** Cylindrical, hard, longitudinal, narrow, cracks and small rootlets, tough with irregular fractures; the cork region shows grayishbrown, middle region greyish-white, and xylem region cream colored.
- **Flowers:** Small, Bluish-purple, cymes peduncled, large forming terminal, often pyramidal panicles.
- **Fruit:** The fruit is light brown to black with rounded drupe, 1 mm to 3 mm in diameter, 1/3rd to 3/4th of its size surrounded by a dull grey cup-like, persistent calyx along with pedicel; calyx cup may show one or two vertical splits; two locules each containing two seeds; smooth texture with uncharacteristic taste and odour (1).
- **Distribution:** It is a perennial tree distributed throughout the great outer part of Himalayas, India ascending to an altitude of approx 1500 meters. Highly distributed in the hill region of Afghanistan, Bangladesh, Bhutan, Cambodia, China, Indonesia, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Taiwan, Thailand, and Vietnam.
- **Habitat:** Required warm regions, common in waste places around villages, river banks, and moist localities in the deciduous forests(2).
- **Taxonomy:**-*Vitexnegundo* Linn. (Verbenaceae), locally known as 'Nirgundi' an important medicinal plant. *negundo* Linn. is a woody, aromatic deciduous shrub growing to a small tree. It is an erect, 2-5 m in height, slender tree with quadrangular branchlets. The leaves have five leaflets in a palmately arrangement, which are lanceolate, 4-10 cm long, hairy beneath and pointed at both ends.(3)

### 1.3 Plant Anatomy

- Kingdom - Plantae - Plants
- Sub Kingdom - Tracheobionta - Vascular plants
- Super division-Spermatophyta - Seed plant
- Division-Magnoliophyto-Flowering plants
- Class-Magnoliopsida-Dicotyledons
- Subclass-Asteridea
- Order-Lamilales
- Family- Verbenaceae
- Genus - *Vitex* Linn.
- Species - *Vitexnegundo* Linn. (Chaste tree).



- **Plant Description:** Nugundo is an erect shrub or a small tree that grows from 2 to 8m in height. The bark is usually reddish-brown. Its leaves are branched into three to five finger like lanceolate leaflets. Each leaflet is around 4 to 10cm in length. The copious purple-white flowers are borne in panicles about 10 to 20cm in length. The petals are of different lengths, with the middle lower lobe being the longest. Both the corolla and calyx are covered in dense hairs [5].
- **Special Characters:** Branchlets have prominent auxiliary spines and leaflets possess numerous minute gland dots. The fragrant white flowers contain many stamens. Fruits resemble wood apple. The tender shoots and leaves are quite brittle.
- **Powder Characters:** Grey to grayish-brown; thick-walled, angular cells of cork., numerous prismatic crystal of calcium oxalate, crystal fibres, starch grains simple, 5-19  $\mu$  India, mostly round to oval with eccentric hilum; compound starch grains having 2-3 components, fragments of xylem vessels with bordered pits and thick-walled xylem fibres.
- **Chemical Constituents:** Leaves contain an alkaloid nishindine, flavonoids like flavones, luteolin-7- glucoside, casticin, iridoid glycosides, an essential oil and other constituents like vitamin C, carotene, gluco-nonital, benzoic acid,  $\beta$ -sitosterol and C-glycoside (Husain et al, 1992). Seeds contain hydrocarbons,  $\beta$ -sitosterol, benzoic acid and phthalic acid (Husain et al, 1992), anti-inflammatory diterpene, flavonoids, artemetin and triterpenoids (Chawla et al, 1991, 1992). Fatty acids,  $\beta$ -sitosterol, vanillic acid, p-hydroxybenzoic acid and luteolin have been isolated from bark (Husain et al, 1992). Stem bark yields leucoanthocyanidins (Husain et al, 1992 Chopra et al, 1956) 6)

#### 1.4 Pharmacological Action

- **Anti-inflammatory Activity:** A low dose of *V. negundo* potentiates anti-inflammatory activity against phenylbutazone and ibuprofen observed in carrageenan-induced hind paw edema and cotton pellet granuloma models. The potential anti-inflammatory activity indicates that *V. negundo* may be useful as an adjuvant therapy in chronic condition along with standard anti-inflammatory drugs. 7)
- **CNS Depressant Activity:** Methanolic leaves extract of *V. negundo* was reported as significantly potentiate the sleeping time induced by pentobarbitone sodium, diazepam, and chlorpromazine in mice.
- **Antifungal Activity:** The ethanolic leaves extract of *V. negundo* possess a new flavone glycoside and evaluated for their antimicrobial activities. The new flavone glycoside was reported as good antifungal activity against *Cryptococcus neoformans* and *Trichophyton mentagrophytes*.
- **Antihyperpigmentation Activity:** A. Malik et al. (2006) investigated tyrosinase inhibitory potential of lignans isolated from the methanolic extract of *Vitex negundo* roots using SpectraMax 340 microplate reader. 9)
- **Immuno-Stimulant Activity:** D.D. Singh et al. (2005) reported immunostimulatory activity from the extracts of *Vitex negundo* in oxyburst phagocytic assay using human polymorph nuclear cells. 10) J.L. Suri et al. reported immunostimulatory potential of two iridoid glucosides from *Vitex negundo* leaves. 11)
- **Hepatoprotective Activity:** A. Prabhakar et al. investigated hepatoprotective activity of Negundoside & agundoside from *Vitex negundo*. Both compounds were used in combination with one or more pharmaceutical additives which prevent and treat hepatic diseases. 12'13)
- **Mosquito Repellent Activity:** P.K. Amancharla et al. (1999) tested mosquito repellent activity of aqueous extract of *Vitex negundo* leaves. A new chemical 'rotundial' was tested for the said activity. 14)

#### 1.5 Phytochemistry

According to Namdeo (18), about a quarter of all the prescribed pharmaceuticals in developed countries include compounds that are directly or indirectly, obtainable from plants. *Vitex negundo* has been found to be a warehouse of a number of biologically active components or phytochemicals that possess generous use in the pharmaceutical industries. Generally, phytochemicals or secondary metabolites occur in the form of complex mixtures that differ among plant organs and stages of development (19,20).

### 1.6 Medicinal Importance

The natural products and related drugs are used to treat about 87% of all categorized human ailments (21). A report of World Health Organization says that more than 80% of world population depend on traditional medicine for their primary health care needs (22). On the other hand, there is a continuous development of resistant strains that pose the need for search and advancement of new drugs to cure diseases (23). Usually herbal medicines, rather than merely curing a particular disease, aims at returning the body back to its natural state of health (24). The phytochemical constituents of medicinal plants often function individually, additively or synergistically in improvement of health (25). After having analyzed the various chemical components available in different parts of *Vitexnegundo*, it is essential that focus shifts to the medicinal applications of the plant. These properties have been categorized under three heads: traditional medicine, folk medicine and pharmacological studies. Herbal medicine, rather than merely curing a particular disease, aims at returning the body back to its natural state of health. The phytochemical components of medicinal plants often act individually, additively or synergistically in improvement of health.

## II. CONCLUSION

*V. nungundo* possesses numerous biological activities proved by many experimental studies. There arises a need therefore to screen medicinal plants for bioactive compounds as a basis for further pharmacological studies. According to the thorough study of the available literature it is quite obvious that the importance of *Nirgundi* in traditional system of medicine is of utmost significance. Almost all parts of the plant are used in preparing herbal medicines. The plant is known to possess anticancer, antimicrobial, antifeedant, antiinflammatory, antihyperpigmentation, hepatoprotective, antihistaminic, analgesic and related activities. Scientifically explored exhaustive reports of the plant, their medicinal properties and active chemical constituents have a role in the management of various human ailments. This review attempts to encompass the available literature on *Vitexnegundo* with respect to its traditional uses, chemical constituents and summary of its various pharmacological activities. *Vitexnegundo* is one of the very important plants which have wide applications in traditional systems of medicines.

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