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Vitex Trifolia: A Review of Ethnobotany and Pharmacology

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ABSTRACT

Objective: From the point of view of this review, the following are some of the things that have been done or investigated with the plant *Vitex trifolia* habitat macro-microscopy, phytoconstituents, medicinal uses, clinical investigations, and toxicological.

Methods: Many species of the genus Vitex are used extensively in traditional Indian medicine. There are 270 species of Vitex plants known to exist today. In Ayurveda and Unani, *V. trifolia* is used. Secondary metabolites, including tannins, saponins, polyphenolic chemicals, phytosterols, and terpenoids, are abundant in these plants.

Results: The findings from different research Antiasthmatic, hepatoprotective, antibacterial, antioxidant, analgesic, larvicidal, and anti-inflammatory are some of the qualities possessed by *V. trifolia*.

Conclusion: According to the *V.trifolia* review, further research into the plant's therapeutic value and the safety of its extracts is necessary.

Keywords: *Larvicidal, analgesic, antimicrobial, antioxidant, hepatoprotective, antihistamine, and antiasthmatic properties of this compound Healing of wounds, the plant known as Vitex trifolia.*

1. INTRODUCTION

There are several plant species in the genus Vitex, which are used in traditional medicine. One of these is *Vitex trifolia*, a small, aromatic deciduous shrub or plant native to the coast that belongs to the Lamiaceae family. It has few side effects and is commonly used in traditional Indian medicine. There are approximately 270 species of Vitex reported worldwide [1,2].

2. MICROSCOPIC EVALUATION

The adaxial surface of the leaflet is 140 µm thick in the ridged portion and 120 µm thick in the spaces between the ridges. A subepidermal layer with a rather thick wall and a thin cuticle measuring 10 µm is present beneath the thick and prominent adaxial epidermis, which has rectangular cells. Fifteen micrometers thick is the hypodermal layer. There is a thick midrib. The epidermal layer consists of tiny cells and is quite thin. Circular compact parenchyma cells with thin walls make up the midrib's ground tissue [4]. The midrib's circulatory system is composed of a series of parallel rows of xylem, each of which is around six cells thick walled and angular, with a thin parenchymatous space in between. The trichomes on the abaxial side are thick and non-glandular, and the adaxial side is round and collateral. There are four layers of cylindrical cells that make up the mesophyll. These palisade and spongy parenchyma cells eventually shrank in height as they descended.

3. MACROSCOPIC EVALUATION

Each of V. trifolia's green leaves has 7–12 pairs of lateral nerves, as well as terminal and supra axillary panicles that are 5–26 cm long and contain resinous glands that mentose beneath [3]. With petioles that are grey-appressed, three-foliolate leaflets are narrow, elliptic or oblong-obovate, canaliculate, and 0.5-3.5 cm long. The shape of the leaves can range from obtuse to acute to cuneate at the base, with entire margins and an acuminate tip. The middle and lateral leaflets are 2.5-6.5×1-3.5 cm and 0.5 cm long, respectively. The terminal leaflet is sessile and measures 5-6.3 by 2.5-3.8 cm, while the smaller lateral leaflets are 2.5-4.5×1-1.5 cm. All of the leaves are glabrous above and very densely white-tomentose beneath. The base of the leaves tapers, and the common petioles are 1.3-1.6 cm long. Mats of fragrant flowers with pedicels that are half

a centimeter to one centimeter long and covered in soft hair termed tomentose commonly grow from stems that are procumbent and rooted at the nodes or annulate nodes. The mats can be several meters in length. The flowers, which have a campanulate calyx and are born in panicles, have two-lipped corollas that range in color from purple to violet. The fruits, which are 6 mm in diameter, contain four little black seeds [5].

4. TAXONOMICAL CLASSIFICATION [6]

Kingdom: Plantae,

Class:Eudicots,

Order:Lamiales,

Family:Lamiaceae,

Genus: *Vitex*,

Species: *Trifolia*.

Vernacular names

- Sanskrit: Jalanirgundi,
- Hindi: Nichinda,
- Manipuri: Urikshibi,
- Bengali:Paniki-shumbala,
- Kannada:Nira-lakki-gida,
- Malayalam:Lagondi,Nirnoschi,
- Tamil:Nirnochchi,Shirunoch-chi,
- Telugu:Niruvavili,Shiruvavili.

Phytochemical Constituents

Proteins, tannins, phytosterols, saponins, and polyphenolic chemicals are all found in this plant. From the stem, terpineol, alpha-pinene, 3,6,7-trimethyl quercetagetin, Vitex trifolia A–G, monoterpenes and diterpenes, dihydro solid agenone, beta-sitosterol-3–O-glucoside, hexanic acid, and dichloro methanic acid were recovered from the fruits of V. trifolia [7-11]. There was a report on the methyl-p-hydroxybenzoate [12]. It has been found that six flavonoids exist [13]. From V. trifolia, fifteen different substances were extracted. Essential oils, flavones, artemetin, 7-dimethyl artemetin [14], friedelin, and a few non-flavonoids and alkaloids are found in the bark and leaves. Among sesquiterpenes, caryophyllene is the most abundant. The plant has yielded a novel alkaloid called vitricin [15]. In V. trifolia, you can find spalmitic acid, ethyl-p-hydroxybenzoate, 3,4-dihydroxybenzoic acid, 4-hydroxy-3-methoxybenzoic acid, caffeicacid, hydroxyl ethyl cinnamate, luteolin, quercetin, apigenin, casticin, and 3,6,7-trimethyl quercetagetin. Results from phytochemical analyses of the ethyl acetate fraction showed the presence of stigma sterol [16], caffeic acid [17], 7-O-glucopyranoside [18], 3,6,4'-trimethoxyquercetin 7-O-glucopyuranoside [19], and quercetin7-O-neohespridoside [20].

Traditional Uses

As an anti-inflammatory, it has several uses in traditional Chinese medicine, including the treatment of headaches, colds, migraines, eye pain, rheumatic pain, and cancer. The medicinal properties of the leaves include its ability to kill insects and bacteria, alleviate skin conditions like eczema and ringworm, heal liver diseases and swollen testicles, alleviate rheumatic pain, prevent infections like gout and beriberi, and work as a diuretic and febrifuge. The following substances are utilized in medicine: amenorrhea, common cold, headache, watery eyes, mastitis, nervine, cephalic, and emmenagogue, which promote blood circulation in the pelvis and uterus; and coloring matter and acids from fruits. In Unani medicine, V. trifolia is used to cure low libido and is called sambhalu. For diarrhea, as an expectorant, to reduce blood pressure, and to treat the common cold, prosopalgia, chronic tracheitis, sinusitis, periodontitis, rheumatism, and pulmonary TB, the inner barkis is an excellent choice. Insecticidal, diuretic, and antihelmintic properties are attributed to the roots.[21-23]

***In-Vitro* and *In-Vivo* Studies**

This activity kills larvae. The effects of Vitex species extracts on Culex quinque fasciatus larvae were compared in a recent study. Due to its high linolenic acid content, the fatty acid methyl ester extract of V. trifolia exhibited the greatest larvicidal effectiveness compared to the other species [24-25].

Medications that reduce pain and inflammation Results showed that the V. trifolia leaf extract effectively reduced pain, suggesting that it may have a role in nociception. Results showed that V. trifolia had an antinociceptive effect, and they also showed that it may have an additive impact when used with conventional analgesics. Additionally, it was shown that the

acute model of inflammation showed a dose-dependent anti-inflammatory action [26]. Various models of inflammation, including carrageenan-induced paw edema, granulomapouch, and formaldehyde-induced arthritis, were used to assess the effects of an aqueous extract of V. trifolia leaves. Significant reduction of paw edema and exudate production was seen in the results [27]. The acetic acid-induced writhing method and other conventional nociception models were used to investigate V. trifolia's antinociceptive potential [28]. Beneficial for the liver / blossoms

Research on the potential liver-protective effects of ethanolic V. trifolia flower extracts was conducted using a carbon tetrachloride-induced hepatic damage model in rats. When compared to the gold standard medication silymarin, the hepatoprotective efficacy was almost identical [29]. Biochemical analyses of the serum revealed that ethanolic and aqueous V. trifolia extracts reduced serum glutamic-oxalo acetic transaminase, total bilirubin, serum glutamic pyruvic transaminase, serum alkaline phosphatase, and gamma-glutamyl transpeptidase levels, while increasing total protein levels in the treated rats. Hepatic damage was indicated by a substantial rise in liver enzymes in the non-treated group. Histopathological findings of normal hepatic architecture with few fatty lobules further support the idea that V. trifolia provided substantial protection against CCl4-induced hepatocellular injury, lending credence to the hepatoprotective effects of the plant. Antifungal and anticancer Some cell lines were shown to be cytotoxic when exposed to hexane and dichloromethane extracts of V. trifolia aerial portions. Significant suppression of the fungal plant disease Fusarium species was observed in the hexanic extract of V. trifolia prepared from the leaves. An additional investigation [30] examined the cytotoxic effects of petroleum ether and methanol extracts on Vero and MCF-7 cell lines. The study's results imply that V. trifolia could be a promising chemotherapeutic agent for the treatment of breast cancer, as it showed substantial cytotoxic activity against MCF-7 cell lines and poor action against the Vero cell line.

Relieves asthma Three compounds—Viteosin-A, Vitexicarpin, and Vitetrifolin-E—were isolated from V.trifolia leaf extracts by chromatography. The stability of the mast cell membrane and the non-competitive antagonism to histamine were the mechanisms by which vitexicarpin effectively controlled asthma [31]. Healing of wounds We looked for signs of wound healing activity in the ethanol leaf extracts of Vitex altissima and V. trifolia. Both extracts had substantial wound-healing efficacy, according to the research. By showing improved wound contraction and shortened epithelization duration compared to V.altissima, V. trifolia exhibited maximal healing activity [32].

Antibacterial

When tested for antibacterial activity, the extracts of Morinda citrifolia, V. trifolia (leaf), and Chromo laenaodorata showed similar results [33]. Diaterpenoids and leaves that inhibit tuberculosis

There was moderate inhibition of Mycobacterium tuberculosis by the alcoholic and petroleum ether extracts of V.trifolia leaves [34,35].

5. CONCLUSION

An aromatic coastal deciduous shrub native to India, Bangladesh, and Sri Lanka, V. trifolia has a long history of use as a folk remedy for a wide range of conditions. Scientific studies have shown that it has antibacterial, antioxidant, antinociceptive, antiasthmatic, antitubercular, and analgesic properties. We reported and examined the phytochemical constituents of the methanolic and ethanolic extracts of the plant sections that are aerial. In addition, new medications with anti-androgenic, anti-arthritic, antidiabetic, antihypertensive, neuropathic, antiulcer, antipsychotic, and anti-coronary action to bedone need a comprehensive investigation of *V.trifolia.*

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