ISSN: 0975-8585

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Medicinal and Pharmacological importance of *Vitex trifolia*: A Review.

Shashank Tiwari[1]*, and Shreya Talreja[2].

[1]Director, JP College of Pharmacy, Lucknow, UP, India.
[2]Lecturer, JP College of Pharmacy, Lucknow, UP, India.

ABSTRACT

In present scenario the research on plants for medicinal purposes is taking place at a phenomenal level. The traditional medicine systems like Ayurveda have been using plant extracts for curing various ailments. Nowadays even allopathic system of medicine is relying on plant extracts for various medicinal compounds. Among many beneficial medicinal plants, one of them is *Vitex trifolia.* This plant is widely found in coastal areas and is well distributed in Indian coasts as well as the south East Asian coasts. Almost all parts of this plant like leaves, flower, fruit and root are all filled with medicinal properties. It is used for curing ailments like fever, stomach related issues, rheumatic pain and problems caused due to inflammation . It is also used topically for treatment of sore injuries and inflammation. Recent research done on this plant has shown that certain compounds of this plant have potential to act as an anti-cancer drug as well but further research on this area is yet to happen. This paper includes complete description of *Vitex trifolia* in terms of pharmacognosy, phytochemistry and pharmacology.

Keywords: Medicinal plant, pharmacognosy, phytochemistry, pharmacology

https://doi.org/10.33887/rjpbcs/2020.11.5.2

Corresponding author

ISSN: 0975-8585

INTRODUCTION

Plants have consistently assumed a significant place in innovation and development of both western and traditional medicine. In traditional systems of medicine like Ayurveda and Siddha plants have played a significant role in the process of medicine making. Not only in India but in various parts of the world plants have been used for treating various ailments traditionally. Recently it has been studied that the majority of the medicinal compounds of allopathic medicine have been derived from plants. Studies havefound that more than 25% of medicines contain plant-derived ingredients yet only a small percentage of the plants in the world have been evaluated for potential pharmaceutical use. To accelerate the discovery of new bioactive compounds from the plants, consistent efforts in the field of pharmaceutical research are made.Medicinal plants are defined as those plants that are used in treating and preventing various ailments that harm the well being of humans. Medicinal plants are sources of a large variety of potent drugs to alleviate infections and various diseases. Hence, the use of plant-based drugs all over world is increasing. Recent studies indicate that through recent advancements, there have been great developments in the pharmacological evaluation of various plants used in traditional systems of medicine. One such plant of great medicinal value is *Vitex trifolia.* This plant is a shrub, found in the coastal regions of tropical and sub-tropical countries like India, China, and Indonesia etc. This plant is of great medicinal value and has been used in traditional medicine since time immemorial. Even in today's time extensive studies are done on this plant to study possible bioactive ingredient present in it, so that it could be used in medicines in future.

Plant Description: *Vitex trifolia*:

Vitex trifolia Linn. is of the family Verbenaceae. It is also called chaste tree in english and jalanirgundi in Sanskrit. This plant is found in the tropical and subtropical regions around the world including India, Sri Lanka, china and Indonesia etc. It has also been found in East African countries.The plant grows upto the height of 1-3.5 meter. Flowering happens during summer season. Leaves are variable, simple and usually three foliolate, some leaflets are elliptic or oblongobovate but usually obtuse. The terminal leaflets are sessile, 5-6.3 by 2.5-3.8 cm in size, the lateral smaller, sessile. There is a common petioles 1.3-1.6 cm long. The leaves are dark green in colour and bitter in taste.It is a fast-growing shrub. It is popular for its variegated foliage and beautiful blue flowers. The trifoliate evergreen leaves are gray-green with white marginal variegation. The soft leaves have grayish pubescence on their underside and smell pungent when crushed. During the summertime attractive blueflowers with white spots appear in terminal clusters.

Botanical Description of *Vitex trifolia*:

Picture of Vitex trifolia (Source Herb.today)

ISSN: 0975-8585

Species	trifolia
Genus	Vitex
Family	Verbenaceae/ Lamiaceae
Order	Lamiales
Class	Magnoliopsida
Phylum	Tracheophyta
Kingdom	Plantae

Phytochemistry of vitex trifolia:

This plant is known to possess various active constituents such as essential oils, diterpenes, vitetrifolins with several pharmacological properties such as antipyretic, antibacterial, works against asthma and allergic diseases.Five compound are isolated from the fruits of Vitex trifolia and are identified to be rho-hydroxybenzoic acid, beta-sitosterol, beta-sitosterol-3-O-glucoside, casticin and, 3,6,7-trimethylquercetagetin. Several oils were extracted from the leaves of the plant that showed considerable mosquito repellent activity. The active compound identified was rotundinal, a cycloterpene aldehyde. The plant also showed considerable potential as a botanical pesticide.*Vitex trifolia* extracts exhibited anticancer activity on the proliferation of mammalian cancer cells, evaluated by sulforhodamine B, which is widely used in traditional Chinese medicine. The fruit extracts of this plant showed analgesic, antipyretic and anti-inflammatory activity. Flavonoids, isolated from *V. trifolia* exhibited bacteriostasis activity. Vitetrifoline E, isolated from *V. trifolia* leaves has been reported to exhibit tracheospasmolytic activity. *V. trifolia* exhibited antimalarial activity in the range of 10-100 × 10^{-6} g/mL against *Plasmodium falciparum* . Aqueous and ethanolic extracts of leaves of *V. trifolia* were investigated for hepatoprotective activity against carbon tetrachloride (CCl_4) induced liver damage. Results showed significant reduction in total bilirubin and serum marker enzymes.

Medicinal and Pharmacological importance of Vitex trifolia:

Leaves of vitex are commonly used as poultice for rheumatic pains, inflammations, sprains. It is used in curing fever, improves memory, favours hair growth, improves vision and treats leucoderma. Roots of vitex are used in treatment of painful inflammations, cough and fever. Flowers are found useful in treating fever and fruits in treating amenorrhoea.

Traditionally Vitex trifolia is usd for curing the following ailments:

1. **Ring worm Infection:** In traditional medicine systemvitex leaves are used to cure fungal infections. It is done so by using completely crushed leaves mixed with ghee, this mixture is applied on infected area.

2. **Leprosy and Skin Rashes:**Vitex leaves and roots are useful in curing leprosy. The leaves of vitex are ingested along with honey. This according to the traditional medicines is a probable cure for skin diseases like leprosy. Roots and leaves can also be applied topically.

3. **Blood Pitha:**Vitex leaves along with several other herbs can be used to treat a problem called blood pitha according to ayurveda. Vitex helps control blood vomiting ,blood diarrhoea,urinal blood and other blood related diseases.

4. **Joint pains:**Extract of *Vitex trifolia* leavesare given orally to help ease joint pains and sciatica pains.

Other medicinal use which is under research by the western medicine system, are as follows:

- **Anti- inflammatory–**The Immune-mediated inflammatory diseases generally hold a root cause in chronic inflammation. Such diseases include rheumatoid arthritis, inflammatory bowel disease, and psoriasis. *V. trifolia* is traditionally used for various inflammatory ailments. In traditional Chinese medicine dried fruits of *V. trifolia* are used to treat ailments like eyeinflammation, rhinitis and rheumatoid arthritis. Leaves *of V. trifolia* are also used to treat inflammatory conditions, caused by poising from a certain harmful substance. The decoction of the leaves is used to treat oral inflammation and poultice is used to find relief in rheumatic pain and sprains.

- **Anti-oxidant** – Some compounds found in Vitex trifolia exhibit anti-oxidant properties that safeguard the cells from the oxidation process through which free radicals are produced which lead to aa chain reaction and results in damage of the cells. One of the main anti-oxidant found in this plant is ascorbic acid, commonly known as vitamin c which is involved in strengthening immunity and healing skin related problems and is a significant part of collagen protein. It is involved in wound healing as well.

- **Hepatoprotective** – According to the studies it is found that leaves and flowers of Vitex trifolia possess potent hepatoprotective activity against carbon tetra chloride induced liver damage. It was found in the study that Vitex trifolia significantly reduced total bilirubin, total protein and activities of serum enzymes in the CCl_4 treated groups. Declinein the bilirubin level indicates the effectiveness of the extract in the normal functioning of the liver.

- **Anti-fungal–**According to a research several compounds present in Vitex show significant growth inhibition in various fungal strains of tricoderma and aspergillus genus. But more elaborate and in depth study still has to be done to prove above theories.

- **Wound healing-** In a recent research it was found that extracts from Vitex trifolia exhibitedprofound wound healing activity. This was proved by an increase in the wound contraction rate,decrease inepithelialization period, breaking strength of skin and there was increased collagenation which showed the signs of speedy wound recovery. This plant is useful not only in treating cuts but also helps in healing inflammation due to its anti inflammatory properties as well.

- **Anti-cancer activity**-among all the compounds obtained from Vitex, 6 compounds, which are flavinoids, persicogenin, artemetin, luteolin, penduletin, vitexicarpin and chrysosplenol-D were isolated and identified for the anti-proliferative effect on mammalian cancer cells. It was found that the extracts inhibited the growth of cancer cells by inducing apoptosis and inhibiting the cell cycle.

- **Insecticidal (larvicidal for mosquito)-**A crystalline compound named Methyl-p-hydroxybenzoate extracted from Vitex trifolia showed insecticidal properties and it works exceptionally well in irradicating the larvae of the mosquito of genus Aedes.

Some other ailments which can be cured by extracts of vitex trifolia are asthama, bronchitis and tuberculosis. This plant has properties like analgesic, vascular relaxation, trachea-spasmolytic, anti-helminth etc. In general it is a very useful plant and can be very effective in finding cures of diseases like cancer if effective research is done on the phytochemistry of this plant.This plant is also used in treatment of skin diseases, spleen disruption, and rheumatism. This plant is also helpful in regulationof menstrual cycle and bowel function. It stimulates healing of sore wounds, neutralizes poisons, and promotes vitality. The juice of the Vitex leaf is used to treat varicose veins and other circulation related problems. The leaf juice is applied topically to heal chronic sores and is put inside the ear to eradicate earaches and to cure ear infection. Leaves boiled in water are ingested for weakness and weight loss. Vitex leaves are also used for curing diseases like malaria due to its larvicidal properties. Vitex is also useful in curing menstrual problems, and complications related to child birth. Dried leaves are used for curing insomnia and brain abnormalities.

CONCLUSION

Plants are one of the most extensive sources of medicine for both traditional medicines like Ayurveda and siddha as well as the western allopathic medicine. On one hand traditional medicine is purely plant based, on the other hand western system of medicine has also started acknowledging th importance of plants and now majority of bioactive ingredients present in western medicines are plant derived ingredients.*Vitex trifolia* is one such plant which is highly important in traditional medicine. The bioactive compounds found in leaves, roots, flower and fruits of Vitex are rich in chemicals that help in treatment and prevention of various ailments like inflammatory diseases, fevers and skin diseases etc.The plant *Vitex trifolia* is a flavonoid rich medicinal plant which has been traditionally used to treat rheumatic pain as well. Also, pharmacological properties have been linked with Vitex which are anti-microbial, anti-cancerous, insecticidal, anti-inflammatory and hepatoprotective activity.Through the review it can be concluded that the main phytochemical constituents of Vitex trifolia have anti-oxidant, anti-inflammatory, anti-microbial, anti- carcinogen, anti-asthmatic and hypatoprotective properties.Though these findings tell a promising prospect for use of Vitex trifolia in modern medicine but still a lot of research in this area is required for any substantial incorporation of the compounds of this plant in medicine. Especially in the field of oncology and hepatology the compounds of this plant can pose of great benefit in producing anti-cancer and hypatoprotective drugs [1-17].

REFERENCES

[1] Aranda E, Hernandez MM, Heraso C, Villarreal ML, Arispuro IV. Biological activities of crude plant extracts from *Vitex trifolia L*. Journal of Ethnopharmacology, 1999, 67(1): 37-44.

[2] Arulanandam JP, Ghanthikumar S. (2001). Indirect organogenesis of *Vitex trifolia Linn*. – An important Medicinal plant. *Nat prod rad vol. 2.* Pg. 261-264

[3] Aweng E.R. et. al. (2012). Anti-oxidant activity and Phenolic compounds of *Vitex trifolia* var. simplicifolia associated with anti-cancer. *ISCA int. J. Biological Sci. Vol. 1.* Pg. 65-68

[4] Chan et. al. (2016). Medicinal plants of Sandy shores: A short review on *Vitex trifolia L*. and *Ipomoea pes-caprae* (L.) R. Br. *Indian journal of natural products and resources.* Vol 7(2), pp. 107-115

[5] Tiwari Shashank et al. An overview on coronil drug, : J.global trends pharm sci.(2020), 11(3), pp: 8242-8247

[6] Ganpaty S. & Vidyadhar K.N. (2005). Phytoconstituents and biological activities of Vitex- A review. *Journal of Natural Remedies Vol. 5.* Pg. 75-95

[7] Hossain M.M., Paul N., Sohrab M. H., Rehman E. and Rashid M. A. (2001). Antibacterial Activity of *Vitex trifolia,* fitoterapia. IJPS Vol. 7. Pg. 695-697

[8] Kulkani L.A. (2011). Pharmacological review on *Vitex trifolia L*. (verbenaceae). *Pharmacology online vol. 3*. Pg. 858-863

[9] Manjunatha B.K. & Vidya S.M. (2008). Hepatoprotective activity of *Vitex trifolia* against Carbon tetrachloride induced hepatic damage. *Indian Journal of Pharmaceutical Sciences.* Pg. 241-245

[10] Shashank, T., & Batra, N. (2014). Oral drug delivery system: a review. *American Journal of Life Science Researches*, *2*(1), 27-35.

[11] M a r y R A , Vi l l a s e n o r M . C o m p a r a t i v e a n t i - hyperglycemic potentials of medicinal plants. Journal of Ethnopharmacology, 2006, 104(1-2): 129-131.

[12] Tiwari, S., & Talreja, M. S. Do you think disease and disorder are same?–here is the comparative review to brash up your knowledge. J. Pharm. Sci. & Res. Vol. 12(4), 2020, 462-468

[13] Mary R.N.I. et. al. (2015). Screening of antibiofilm ant anti-Quorum sensing Potential of Vitex trifolia in Pseudomonas aeruginosa. *Int. J Pharm Pharm Sci. Vol.7.* Pg. 1721-1723

[14] Meena A.K. et. al. (2011). A review of the important chemical constituents and medicinal uses of *Vitex* genus. *Asian Journal of traditional Medicine.* Pg. 54-60

[15] Zeng, X., Fang, Z., Wu, Y., & Zhang, H. (1996). *Zhongguo Zhong yao za zhi = Zhongguo zhongyao zazhi = China journal of Chinese materia medica*, *21*(3), 167–191.

[16] Tiwari, Shashank, "Unit Dosages Form Tablet: An Overview." International Research Journal of Humanities, Engineering Pharmaceutical Sciences (Ijheps) 1.09 (2015): 8-36.

[17] Photo reference, https://herb.today/vitex-trifolia-scientific-name-vitex-trifolia-l/#jp-carousel-31600