

PHYTOCHEMICAL INVESTIGATIONS AND THERAPEUTIC POTENTIAL OF *VITEX NEGUNDO*: A REVIEW

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Abstract: Plants have proved to a crucial role in human lives due to their immense beneficial aspects. Plants contain many biochemical substances located in various parts of their bodies which are termed as phytochemicals. These are also termed as active secondary products or metabolites that are used to treat many human diseases. Research is going on large scale whereby plants are examined for their metabolite exudates that further generate beneficial and assertive outcomes. One such plant is which is being discussed in this context is *Vitex negundo* that is also known as 'Chastetree'. This plant belongs to Verbenaceae family and has enormous certain chemical active principle ingredients in its body parts such as alkaloids, flavonoids, terpenes, saponins, lignins and so on which are basically are obtained from leaves and seeds of this plant. The most important alkaloid that was worked upon is Nishidine'. The present review paper throws light upon therapeutic and bioactive phyto compounds that are chemical constituents of economic and industrial value.

Keywords: metabolites, nishidine, *Vitex negundo*, anticancerous. Green environment, plant

INTRODUCTION:

Herbal medicine has found place in therapeutic industry since time immemorial. One such family is Verbenaceae and one important plant of this family that has vital role in therapeutics is *Vitex negundo*. Members of this family are rich in medicinal properties and are known to cure leprosy and other skin related ailments. (Venkateshwarlu, 2012). *Vitex negundo* is a perennial plant that grows at an altitude of 10-15 m in height.

The family Verbenaceae also called Vervain family serve as important role in medicinal industry and contains 77 genera and 3020 species of flowering plants under order lamiales. Most species are edible and rich in essential oil and their fragrances. The well known genera include *Duranta*, *Lantana*, *Clerodendron*, *Grandularia* that comprise most part distribution of plants worldwide. The family is known for the production of active constituents that find their place in pharmaceuticals and are rich in essential oils and fragrances. Reseraches over this plant generates a scope for this plant to be used as medicine in pharma industry. The

present paper deals with phytochemical investigations and therapeutic potential of *Vitex negundo*.

PLANT DESCRIPTION:

Vitex negundo Viv. (Verbenaceae) is mainly a perennial shrub, slender tree with tomentum which is also known as 'chaste tree'. The plant possess and is well known throughout india in Asia. This plant is a native shrub of southern India. Appearance of leaves is lanceolate with acute basal petioles. Inflorescence of flowers is pedunculate cymes and fruits are drupe with blackish appearance on ripening. (Bansod, 2009). The plant belongs to family Verbenaceae and possess hepato-protective, anti-oxidant, anti-cancerous properties. It is known to be effective in treating eye disease, leucoderma, asthma, stomachache and bronchitis. It is grown as an ornamental plant in cool temperate area in Himalayan region in India. It bears lavender color blooms and this shrub is preferably found in well drained soil and is rich in alkaloid content with certain export values. The plant can withstand wind and its flowers possess pleasant fragrance (Pawar and Kamble, 2017).

THERAPEUTIC POTENTIAL:

The plant is used to cure various ailments like its seeds are used in premature ejaculation control and treats joint aches. The leaves are known to treat vaginal discharge, edema, fever etc. The plant possess several medicinal properties as purgative, coavalcent, carminative, tranquilizer, antispasmodic and many more. The decoction of the leaves is known to treat catarrhal fever. (Venkatesh, 2012). Chryso splenol D obtained from the plant has antihistamine and muscle relaxant properties (Bano and Ahmed, 2015). The leaves of this plant are rich in aroma and considered as tonic and vermifuge. The plant was used to analyze the phytochemical active antioxidant content in seeds by (Patil, 2015). Research related to antibacterial activity was seen by (Murugesan, 2017).

PHYTOCHEMICAL INVESTIGATIONS:

The medicinal potential was explored in this plant because it has numerous secondary metabolites and other active constituents that pave its way in the pharmacy sector. The plant has been exploited for anti-micro filarial activity from the methanolic extract of roots. (Sahare, 2008). Seeds of *Vitex* were used to observe the nitrous oxide lignans by (Zheng, 2009). Recent studies were done by using leaves of *Vitex negundo* which showed depletion of calpain and generation of cataract in selenite models. (Rooban *et al.*, 2009)

Studies on alcoholic extract of the roots of this plant were carried to explore phytochemical and anti-convulsant activities. (Singh *et al.*, 2011). Leaves of *Vitex negundo* were screened for study of total phenol content, anti-oxidant and GC-MS analysis. (Kumar *et al.*, 2010). A compound named Vitexin was determined by HPLC in *Vitex negundo* var. *cannabifolia* by (Luo *et al.*, 2011). Anti-filarial activities were explored using ethyl acetate in the leaves of this plant (Sahare, 2013). Studies on leaves of this plant were carried *in vitro* and *in vivo* for bactericidal properties against certain variable multidrug resistant pathogens of bacteria. (Kamruzzaman *et al.*, 2013). Significant researches on this plant were done to elucidate anti-osteoporotic activity by (Zheng, 2014). Antioxidant potential and *in vitro* anti-venom activity of leaves of this plant were carried against *In vitro* anti-venom and antioxidant potential of

Vitex negundo leaves (green and blue) against the venom of (*Daboia russelli*) Russell's viper and (*Naja naja*) Indian cobra were carried out. (Durairaj *et al.*, 2014). Vitexdoin was a new lignan obtained from seeds of *Vitex* by NMR spectroscopy studies. (Lou *et al.*, 2014). Seeds of *Vitex negundo* var. *heterophylla* were used to isolate four new compounds of phenols termed as vitexnegheteroins A-D (1-4) along with other known eight compounds. (Hu *et al.*, 2016). The structures of these plants were explored using extensive 1D and 2D NMR studies and data of mass spectroscopy. These structures were successful to exhibit new anti-inflammatory and anti-oxidant properties of this plant. ICP-MS was used in analysis of metals and mineral elements in leaves of *Vitex negundo*. (Ibrahim *et al.*, 2019). *In vitro* studies on leaf extracts of this plant were explored to detect anti-inflammatory potential. (Mandal, 2020). This majestic plant is rich in a variety of substances such as lignans, terpenoids, polyphenols, iridoids, alkaloids and glycosides. Corymbosine, luteolin-7, gardinin, casticins luteolin, , were some flavonoids encountered in leaves and extracts of *Vitex negundo*. Plant was exploited for anti- microbial, anti oxidant and anti filarial, other properties using methanolic extracts of leaves and seeds. (Kumar, 2010).

CONCLUSION

Plants are numerous source of active principle ingredients which are present in leaves, stems, barks, flowers etc. These metabolites although present in small numbers but tend to possess certain therapeutic and medicinal properties. With time being many plants have been explored worldwide for these active ingredients termed as phytochemicals or secondary metabolites. The potent value of *Vitex negundo* has been explored by many researches worldwide for their medicinal properties. In this review, therapeutic potential and work on phytochemistry has been given by some researchers wherein this plant proved to be effective and valuable in terms of natural products and to assess new compounds that can be used in pharmacognosy. So concluding with this, *Vitex negundo* can be explored for more number of medicinal properties that can be used for human welfare.

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