



## Review Article

# A Review on Genus *Vitex*-A Novel Medicinal Plant

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Plants produce various kinds of chemicals through metabolism (Primary and Secondary) which play an important role in growth of the plant and act as a defensive material. These compounds are recognized as essential nutrients for normal physiological functions. Recent researches demonstrate that these compounds protect human against diseases in various actions such as antioxidants, hormonal action, anti-microbial and even in physical actions. The genus *Vitex* is evident of many phytochemicals which is therapeutic values.

**Key words:** Therapeutic, medicinal, efficacy, phytochemical, verbenaceae

## 1. INTRODUCTION

Plant metabolites are used traditionally to treat various chronic and infectious diseases<sup>1</sup>. WHO stated 80% of World's population depends on the traditional medicine for their primary health care and immediate remedy<sup>2,3</sup>. Phytochemicals are the major source of antimicrobial drugs which form the major alternative traditional medicine for various diseases<sup>4,5</sup>. Folk knowledge and preexisting plant data evaluated and scientific research on phytochemistry, biology and pharmacological activities revealed several discoveries and investigations on drug discovery<sup>6,7</sup>. Several researches on plant metabolites revealed antimicrobial activities<sup>6,8,9</sup> against wide range of drug resistant bacteria<sup>10,11</sup>, anti-cancer<sup>12</sup>, anti-hepatotoxic<sup>13</sup>. WHO report

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estimated around 21,000 plants have been used for medicinal purposes and out of which 500 higher plants are recognized as potential source of drugs<sup>14</sup> and it was also reported that around 119 pure phytochemicals are extracted from 90 plant species<sup>15</sup>. The major phytochemicals are used as pharmaceuticals, agrochemicals, flavours, fragrance, food additives, insecticides, pesticides etc.<sup>14,16</sup>.

*Vitex* is a genus of flowering plants<sup>17</sup> of family Lamiaceae consisting of 250 species<sup>18,19</sup> and commonly known as "Chaste tree"<sup>20</sup> and they are native of Tropical and Subtropical countries<sup>21</sup> and the Sanskrit synonyms is tabulated in Table 1. The genus *vitex* is an erect<sup>21</sup> shrub or small tree growing upto 2 to 8 m height. Leaves are digitate with five lanceolate or sometimes three leaflets (4 to 10 cm in length). The leaf edges are toothed or serrated with hairy bottom<sup>6,7</sup>. White or blue flowers borne in panicles (10 – 20 cm in length) with petals of different lengths (middle lower lobe being longer). Corolla and calyx are covered with dense hairs<sup>8</sup> (Table 2). *Vitex negundo* is indigenous to the countries like Malaysia, Vietnam, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Taiwan, China, India, Korea, Kenya, Bhutan etc. The botanical classification of *vitex* is tabulated in Table 3<sup>17</sup> and the vernacular names of the genus *vitex* are tabulated (Table 4)<sup>26</sup>.

## 2. MEDICINAL VALUES OF GENUS

### VITEX

Traditionally, the extracts of the roots, fruits, flowers and leaves of genus *vitex* were used externally and internally. The decoction of leaves is used for steam bath for arthritis, joint pain, sciatica<sup>22</sup>. The smoke of dry leaves are useful for headaches, sinusitis and common cold<sup>24</sup>. Nirgundi oil is best for dry cleaning of wounds, anti-infective and to remove foul smell<sup>25</sup>. The word *vitex* derived from 'Vieo' (Latin) which means tie or bind and out of 270 known species 18 are in regular cultivation as crops and they are called 'Chaste tree'<sup>26</sup>. *Vitex trifolia* is abundant in Southeastern Asia and Melanesia with three leaves commonly known as Indian Privet or Indian wild-pepper<sup>27</sup>. *Vitex trifolia* is also known as 'Pani-Ki-Sanbhala' and 'Sufed-Sanbhalu' in Hindi and 'Langunding-Dagal' in Philippines<sup>28</sup>. The other species found in seashore upto the altitude of 1,500 m are *V. negundo*, *V. glabrata*, *V. leucoxydon*, *V. pendularis*, *V. pinnata* in India and they are abundant on sandy soils<sup>29</sup>. *V. nirgundi* is believed to be sacred as it has been originated from the abdomen of Ganadhipa (an appellation of Lord Shiva and also from Ganesh)<sup>30</sup> and the leaves are offered to both Lord Shiva and Goddess Gowri during Nitya Samavara Vrata<sup>31</sup>.

From ancient times, *V. trifolia* along with anthill acted as the indicator for the presence of tasteful water in the ground<sup>32,33</sup> and *V. negundo* was used as totem plant during war, wherein the soldiers wore the flowers of nocci (*V. negundo*) and it referred Sindhuvara as bad omen for any army camp<sup>34</sup>. The commercial utility of the various parts of

*V. negundo* is wide spread (Table 5) and the various parts have remedy procedures (Table 6). The *Vitex negundo* plant has been proved to be highly therapeutic for many centuries<sup>35</sup> for many ailments such as snake venom neutralization<sup>36</sup>, analgesic<sup>37</sup>, nitric oxide scavenging activity<sup>38</sup>, hepatoprotective<sup>39</sup>, antifungal<sup>40</sup>, anti-lipoaeroxidative<sup>41</sup> and diabetic<sup>42</sup> (Table:7)

### PHYTOCHEMICALS OF VITEX

The crude extracts of leaves registered the presence of alkaloids, flavonoids, terpenoids, steroids, phenolics, carbohydrates and amino acids<sup>43,44</sup>. The therapeutic values of phytochemicals are tabulated in the Table 7<sup>24</sup>. The HPLC results of leaves and the barks of *Vitex leucoxydon* reported to contain febrifuge, - stierol, dimethyl terphthalate, vitexin, isovitexin, agnuside, ancubin<sup>45</sup>. *Vitex eltiissima* leaves are efficient as antibacterial<sup>40</sup> and against mosquitoes. The phytochemicals registered in *V. negundo* leaves<sup>18</sup> were hydroxyl-3,6,7,3',4'- penta methoxyflavone<sup>46</sup>, 6' p-hydroxybenzoyl muscaenonic acid, 5'3' dihydroxybenzoic acid, flavonoids, p-hydroxymethyl-7-methoxy-3,4-dihydro-2-naphthaldehyde<sup>46</sup>. The bioactive compounds of roots of *V. negundo* were vitexin, vitaxin and isovitexin, acetyl oleanolic acid, lyoniresinol<sup>47</sup>.

### VITEX AS PESTICIDES AND LARVICIDES

From ancient times genus *Vitex* leaves are scientifically proved to be effective pesticides against coleopteran pests such as *Callosbruchus chinensis*, *Rhizophtha dominica*, *Sitophilus oryzae*, *Stophilus zeaais*, *Latheticus oryzae* etc.<sup>26</sup>. Combination of essential oil of *Vitex* and *Citronella* oil was very efficient against *Sitotroga cerealella*<sup>39</sup>. Leaf and branches showed highest repellency against insects and pests of paddy, *Euproctis fraternal* and *Spodoptera litura*<sup>6</sup>. The petroleum ether leaf extracts revealed highest larvicidal effect against *Culex tritaeniorhynchus* in the laboratory condition and these acted as a deterrent against the mosquito *Aedes aegypti*<sup>27,48</sup>. The phytochemicals such as alkaloids and glycosides in the leaves of *Vitex* proved to have high germicidal activity<sup>2</sup>. 2-hepatricontanone from leaf extracts of *Vitex* inhibits the oviposition of stored grain boring insects like *S. cerealella*, *R. dominica* and *S. oryzae*<sup>13</sup>.

*Vitex negundo* Linn. proved to be an efficient novel plant against fungi, virus, larva, feedent, bacteria etc<sup>44</sup>. *Vitex negundo* Linn. proved to be highly insecticidal against *Phthorimaea operudella*, *Allosobruchus maculatus*, *Aphis citricola*, *A. gossypii*, *Myzus persicae*<sup>7</sup> and act as the best larvicidal against *Anopheles subpictus*, *Culex tritaeniorhynchus*, *C. quinquefasciatus*, *Anopheles stephensi*. *Vitex* spp. Act as anti-feedant, anti-filarial and anti-fungal against *Alternaria alternata*<sup>49</sup>, *Curvularia lunata*, *Trichophyton mentagrophytes*, *Cryptococcus neoformans*, *Aspergillus niger* and *Candida albicans*<sup>50</sup>.

## 3. CONCLUSION

The genus *Vitex* consists of various bioactive components which are of medicinal value. These bioactive compounds

are evident as additives from Hispanic era in the medical field as anti-microbial, anti-inflammatory, anti-cancerous agents etc. Therefore from the above evidences the leaves of these species may be used as therapeutic agents after a wide clinical analysis and clinical trials.

**Table 1: Sanskrit synonyms of genus *Vitex*<sup>21</sup>**

Name	Sanskrit synonyms	Medicinal meanings
Nirgundi	Nirgudati shareeram rakshati rogbhyaha	Protects body from diseases
Sindhuvara	Sindu shotham vaarayati it sinduvaraha	Helps in relieving from inflammation

**Table 2: Morphological characteristics of Genus *Vitex* leaves<sup>26</sup>**

Characters	Botanical characteristics
Colour	Green
Taste	Bitter
Odor	Aromatic
Size	Compound
Shape	Trifoliate (Occasionally pentafoliate)
Surface	Above-Globrous; Below-Tomentose
Texture	Leathery

**Table 3: Botanical classification of genus *Vitex*<sup>5</sup>**

Kingdom	Plantae
(Unranked)	Angiosperms
Order	Lamiales
Family	Lamiaceae
Subfamily	Viticoideae Briquet
Genus	<i>Vitex</i>

**Table 4: Vernacular names of genus *Vitex*<sup>26</sup>**

Assamese	Pocholia
Bengali	Nigundi, Samalu
Chinese	Huang jing
English	Chaste tree
Gujarati	Nagoda
Hindi	Mewri, Nisinda, Sambhalu
Kanada	Bile Nekki
Korean	Chom Mok Hyung
Malayalam	Indrani
Marathi	Nirgunda
Punjabi	Panna, Mawa, Torbanna
Sanskrit	Nirgundi, Vrikshaha, Sindhu vara
Sinhala	Nika
Tamil	Nachchi, Notchi, Chinduvaram
Telugu	Vavili, Tella-vavili
Urdu	Sumbalm

**Table 5: Commercial medicine of genus *Vitex*<sup>21</sup>**

S. No	Medicine Name	Therapeutic Value
1	Saraswatarishta, Marasamitra vatakam	Fight against pain anxiety and depression
2	Dashamool Taila	Fight against vascular headache and migraine
3	Mahavat vidhwaas ras	Fight against aches, pains and neuralgia
4	Anthrakutaram Gulika	Fight against abdominal colic, constipation and bloating

**Table 6: List of ailments and remedy procedures with *Vitex* plant<sup>21</sup>**

S.No	Ailments	Remedy Procedures
1	Sprain	Fresh leaves are heated and applied on the sprained area
2	Head ache	Fresh leaves are ground to paste

		with water and applied on the forehead
3	Abdominal gas and pain	Fresh leaf decoction is taken orally
4	Fever / Toothache	Fresh leaves are boiled in two glasses of water and boiled for 15 minutes. Decoction is divided into 3 parts and taken thrice a day in a gap of 4 h
5	Asthma and cough	Same as above
6	Ulcers, Boils, Wounds	Fresh leaves are used to make decoction wash the affected area with the decoction.

**Table 7: Medicinal value of *Vitex negundo*<sup>26</sup>**

S.No	Medicinal Preparation	Medicinal Value
1	Kushta	Skin diseases, eczema, ring worm
2	Pleeha	Spleen disorder
3	Gulma	Abdominal tumor
4	Deepani	Carminative
5	Keshya	Hair quality improvement
6	Medohara	Cholesterol
7	Vranahara	Wound healing
8	Shwasahara	Asthma, Bronchitis
9	Smrutida	Memory
10	Aruchi	Anorexia
11	Medhya	Anxiety

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