IJP (2025), Vol. 12, Issue 9 **(Review Article)**

Received on 06 September 2025; received in revised form, 27 September 2025; accepted, 29 September 2025; published 30 September 2025

A REVIEW ON PHARMACOLOGICAL ACTIVITIES OF *ALASTONIA* AND *VITEX NEGUNDO*

Chandan Sharma, Monika Devi *, Kapil Kumar Verma and Anurag Sharma

Minerva College of Pharmacy, Indora, Kangra - 176401, Himachal Pradesh, India.

Keywords:

Alstonia scholaris, Vitex negundo, Antibacterial, Anti-inflammatory, Antimalarial

Correspondence to Author:
Monika Devi

Minerva College of Pharmacy, Indora, Kangra - 176401, Himachal Pradesh, India.

E-mail: Kumarimonu217@gmail.com

ABSTRACT: Two extensively researched medicinal plants having important ethnopharmacological significance in traditional medical systems like Ayurveda and Traditional Chinese Medicine are *Alstonia scholaris* and *Vitex negundo.* Because of its high concentration of alkaloids, flavonoids, and triterpenes, *Alstonia*, and especially *Alstonia* scholaris, is well-known for its antibacterial, anti-inflammatory, and antimalarial qualities. Comparably, *Vitex negundo*, sometimes referred to as the five-leaved chaste tree, offers a variety of medicinal properties, such as hepatoprotective, anti-inflammatory, analgesic, and antioxidant actions. Bioactive substances like flavonoids, iridoid glycosides, and essential oils are mostly responsible for these effects. This abstract highlights the potential for *Alstonia scholaris* and *Vitex negundo* to be developed into new medicinal medicines by reviewing their phytochemical profiles and pharmacological actions.

INTRODUCTION: The scientific field of phytochemistry explains the characteristics of herbs and their therapeutic uses. Numerous plant species that possess these phytochemicals have been proven to be a variety of therapeutic herbs. Despite the widespread use of a number of traditional chemical-based medications, herbal and plant-based medications, commonly referred to as herbal medicine. Even though pharmaceutical companies are increasingly using synthetic and combinatorial chemistry techniques to develop new drugs, medicinal plants remain a significant source of novel chemical entities. Nature has long been a major source of medicinal compounds. Natural resources have served as the foundation for the development of many modern medications.

QUICK RESPONSE CODE

DOI: 10.13040/IJPSR.0975-8232.IJP.12(9).716-24

Article can be accessed online on: www.ijpjournal.com

DOI link: https://doi.org/10.13040/IJPSR.0975-8232.IJP.12(9).716-24

Numerous bioactive agents have been isolated from plants based on their application in traditional medicine. Many medicinal plants have been discovered thanks in large part to ethnobotanical knowledge of traditional plant uses. Because of the numerous active phytochemicals it contains, one such plant, *Alstonia scholaris*, has the pharmacological potential to treat a number of illnesses, including cancer, digestive and respiratory issues, cardiovascular issues, and reproductive issues [1]. A member of the Verbenaceae family, *Vitexnegundo* is a small, slender, hardy tree or shrub that grows in Sri Lanka, Madagascar, Afghanistan, Thailand, Malaysia, India, Pakistan, the Philippines, and Eastern Africa.

It is commonly known as Nirgundi in Tamil and Nika in Sinhalese in Sri Lanka. *Vitex negundo* is primarily found in humid areas, mixed open forests, and along the edges of streams. It blooms all year long and has bluish purple flowers. It has a typical five-foliated leaf pattern, with the lower leaves being smaller and almost sessile, and the

remaining leaves being long-stemmed, ranging in length from 7.5 to 10 cm. *Vitex negundo's* medicinal qualities have been thoroughly studied, and among many other qualities, it has been found to have anti-inflammatory, analgesic, antioxidant, anti-convulsive, anti-bacterial, anti-fungal, cardio-protective, antitumor, anti-allergic, and hepatoprotective effects [2].

FIG. 1: *ALASTONIA SCHOLARIS*

FIG. 2: *VITEX NEGUNDO*

Cultivation: *Alstonia scholaris* is a hardy tree that prefers soils with good drainage. It takes eight to ten years to reach adulthood. Cuttings (which easily root in soil), air-layering and implanting (cleave and upturned T-grafting), and seeds (collected from mature unsplit shells) are some of the ways it can be propagated. It served as a moderator plant for the psyllid *Pauropsylla tuberculata*, which produces galls above the folio exterior, giving the appearance of an unsightly pocket. One of the best propagation techniques for increasing harvest is seeding; in most cases, no pre-treatment is required to grow the crop. Fruits can be picked all summer long before the thin, rigid pods split. Although they are fluffy, seeds cannot spread easily or unintentionally. It could be grown [3].

Common Names of Alstonia: Blackboard tree, Scholar tree, Milkwood, Devil's tree, Indian pulai, White cheesewood, Dita bark, Bitter bark, Saptaparna, Saptachada, Chatraparna .

Parts Used: Stem, bark, root, leaves [4].

TABLE 1: SYSTEMATIC POSITION [5]

Kingdom	Plantae
Order	Gentianales
Family	Apocynaceae
Tribe	Plumeriae
Subtribe	Alstoniinae
Genus	Alstonia
Species	Alstonia scholaris

Phytochemistry of *Alstonia scholoris*: The plant is rich in a variety of chemical compounds. It is well known for having a high concentration of alkaloids, which have therapeutic uses. Since alkaloids have a wide range of chemical structures and have been found to be the cause of the pharmacological properties of medicinal plants, they represent a class of significant importance in the development of new medications. Echitamine, a new glycoside-renoterpine, glucoside triterpenes, amyring acetate, echitamidine, echitenine, and ditamine are all found in stem bark.

Root: It contains hydroxyl-19, akuammigine, tubaitowine, and akuammigine. The indole alkaloids found in leaves include picrinine, botalin, ursolic acid, β-sitosterol, and the recently discovered alkaloid Scholarin.

Flowers: Flowers contain strictamine and picrinine. Fruits: (rhazine) [6].

Traditional Uses: *Alastonia scholaris* bark is used in treating malarial fevers, stomach complaints, dyspepsia, and skin diseases. The bark possesses bitter, astringent, digestive, laxative, anthelmintic, antipyretic, stomachic, cardiotonic, and tonic actions. The bark extract possesses antiplasmodial, immune stimulant, anticancer, hepatoprotective activities. Ayurveda, overnight soaking of the plant bark in water reduces blood glucose levels upon oral administration. Bark is used as a febrifuge, depurative, or galactagogue. It is used in treating leprosy, skin diseases, pruritus, chronic and foul ulcers, asthma, bronchitis, agalactia, and debility.

Milky juice in folkloric medicine is given to wounds, ulcers, and rheumatic pain; in oil and ear poured, it is used to treat ear pain.

Leaves have been used as folk medicines for centuries to treat a variety of diseases, including diarrhea, dysentery, malaria, and snake bites. In some cases, the liquid from the leaves is an excellent galactagogue. Leaves are used to treat beriberi, dropsy, and an obstructed liver.

Latex is used to treat sores, ulcers, tumors, and rheumatic swellings.

Pharmacological Activity: There is growing recognition of *Alstonia scholaris* diverse potential in the field of pharmacology. Its wide range of pharmacological activities have been revealed by contemporary scientific research, making it a topic of interest in several medical specialties [7].

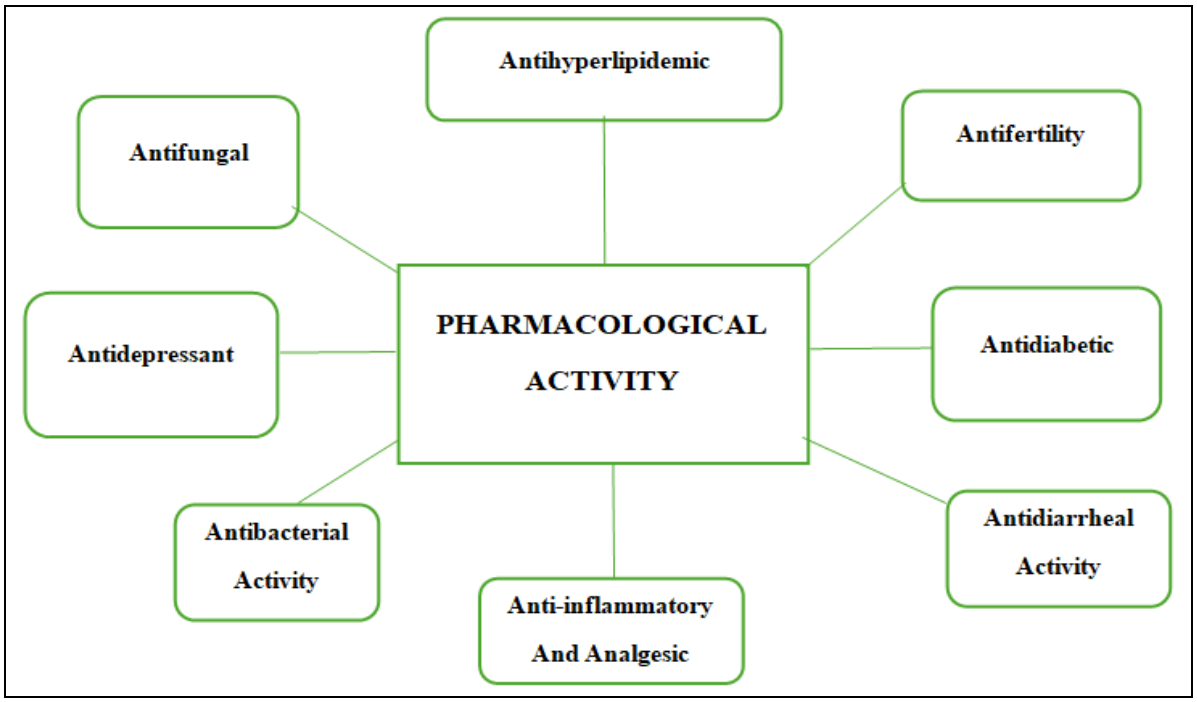

FIG. 3: PHARMACOLOGICAL ACTIVITY OF *ALSTONIA SCHOLARIS*

Antidepressant: Molecular docking analysis and experimental studies have uncovered its ability to exert anti-psychotic effects through the modulation of dopamine levels in the frontal cortical regions of the brain, providing a glimpse into its utility in the treatment of mood disorders [8].

Anti-inflammatory and Analgesic: According to a number of *in-vivo* tests, the three primary alkaloids found in *Alstonia scholaris* leaves picrinine, vallesamine, and scholaricine may have a peripherally analgesic and anti-inflammatory effect. Alkaloids showed inhibition of inflammatory mediators (COX-1, COX-2, and 5-LOX) in *in-vitro* tests, which is consistent with findings in animal models. Additionally, the experiment's COX-2/5-LOX dual inhibitors, including picralinal, tubotaiwine, and 16-formyl 5α-methoxystrictamine, may be worth pursuing further [9].

Anti-fungal Activity: Different plant parts, including leaves, stem and root bark, flowers, and fruits, were extracted using a range of solvents, from polar to non-polar, and their bioactivity was assessed. Only methanol and butanol extracts of each component were chosen for antifungal testing [10].

Antibacterial Properties: The antibacterial profiles of the three extracts leaves, follicles, and latex. All of the tested extracts demonstrated reasonably good bactericidal activity against a set of Gram +ve bacteria, according to the results. But compared to the leaf and follicle extracts, the latex extract showed stronger antibacterial activity. With a zone of inhibition of 21 mm, latex extract (100 mg/ml) performed best against *B. subtilis*. With a measured zone of inhibition of 8 mm, the tested extracts were found to be the least effective against *P. aeruginosa*. The antibacterial potential of the

sample extracts was found to be moderately effective when compared to the commonly used antibiotics [11].

Antidiarrheal Activity: The bark of *A. scholaris* showed cytotoxic and antidiarrheal properties in its ethanolic extract. At a dosage of 250 mg/kg of body weight, it reduced the frequency of bowel movements and postponed the onset of diarrhea in mice. In all four of the lower Mekong basin's countries, *Alastonia scholaris* is frequently used as a remedy for dysentery and diarrhea. The parts of the plant that were most frequently mentioned were the bark and leaves. *A scholaris* for the treatment of diarrheal illnesses. Regarding its pharmacological characteristics, a methanolic extract of *Alastonia scholaris* showed an antidiarrheal effect (a reduction in the frequency of defecation) in a mouse model of castor oil-induced diarrhea, and an isolated rabbit jejunum preparation was used to confirm its spasmolytic qualities [7].

Antipyretic Activity: Fever, also known as pyrexia, is the body's natural defense mechanism to produce an environment in which damaged tissue or infectious agents cannot survive. The antipyretic properties of *Alstonia macrophylla* leaf extract and its fraction have been investigated up to this point. The antipyretic properties of *Alstonia macrophylla* leaf methanol extract (at 200 and 300 mg/kg, p.o.) and its n-butanol fraction fractions (at 50 mg/kg, p.o.) containing β-sitosterol, ursolic acid, and β-sitosterol glucoside were investigated in Wistar albino rats with normal body temperature and pyrexia induced by yeast. When compared to the common antipyretic medication paracetamol, all extracts and portions demonstrated a significant antipyretic effect in a dose-dependent manner. However, when the two factions were given together, the observed antipyretic effect was stronger, meaning that they had an additive effect [10].

Antifertility: By considerably lowering the weights of the testes, epididymis, seminal vesicle, and ventral prostate, one study demonstrated that *Alastonia scholaris* has an antifertility effect. According to research by Gupta et al., rats that are fed the bark extract for 60 days in a row experience antifertility. Without changing the overall body weight, the extract specifically reduced the weight and protein content of the testes, epididymis, seminal vesicle, and ventral prostate**.** Male rats treated with *Alastonia scholaris* showed decreased fertility, as evidenced by a significant decrease in sperm concentration and decreased sperm motility in the testes and cauda epididymides. The antifertility properties of *Alastonia scholaris* may be explained by luteol acetate, a component of the plant, which exhibited comparable cellular, biochemical, and histological manifestations to those observed with the entire extract [7].

Anti-hyperlipidemic: Without causing hypoglycemia in normal rats, the aqueous extract of *Alstonia scholaris* dramatically lowered elevated blood glucose levels in streptozotocin (STZ)-diabetic rats. Increased glucose uptake by peripheral tissues, enhanced insulin sensitivity in target tissues, or better glucose metabolic regulation could all contribute to the extract's antidiabetic effects. The bark of *Alstonia scholaris* considerably decreased serum [10].

TABLE 2: PHARMACOLOGICAL ACTIVITY OF *ALSTONIA SCHOLARIS*

Activity	Part/extract	Animal model / cell line
Anti-malarial	Methanol extracts prepared from various parts of *A. scholaris, A. macrophylla* and *A. glaucescens*.	Anti-plasmodial activity against the human erythrocyte-cultured K1 strain of Plasmodium falciparum, which is resistant to multiple drugs [11]
	The bark's methanol and petroleum ether extracts	Antimalarial activity in Plasmodium berghei-infected mice [12]
Anti-fertility	*A. scholaris* benzene extract was used to isolate luteol acetate.	Weights of the body and reproductive organs, such as the testes, epididymis, seminal vesicle, and ventral prostate, were measured. Male albino rats were also used to assess motility, testicular sperm count, and epididymal sperm count [13]
	Plant-derived α-amyrin acetate.	The effect on fertility was studied using male albino rats [14]
	Bark extract	At this dose level, the drug had a significant antifertility effect on male rats. Meiotic germ cells might be the main site of action 15
Antileishmanial	Plant extract	Hamsters infected with *Leishmania donovani* were used to test

		the antileishmanial properties of plants [16]
Hepatoprotective	Plant extract	Serum biochemical and histopathologic analyses were used to look into liver damage brought on by carbon tetrachloride (CCl4), β-dgalactosamine, acetaminophen, and ethanol [17]
Toxicological profile	Different doses up to 2000 mg/kg.	Mice and rats were used to test the acute and subacute toxic effects of different dosages of A. scholaris (ASE) hydro-alcoholic extract [18]
	Hydro-alcoholic extract	Hematological analysis showed a marked increase in lymphocytes, eosinophils, and basophils along with a dose-dependent decrease in RBC, WBC, hemoglobin, neutrophils, and monocytes. The observed toxic effect of ASE may be explained by the presence of echitamine [19]
Teratogenic effect	Hydro-alcoholic extract	On Day 11 of gestation, the teratogenic effect was examined in Swiss albino mice that were pregnant [19]

Vitex Negundo:

Medicinal Uses of *Vitex negundo*: Medicinal herbs can improve general health because of the variety of phytochemicals they contain. A sizable portion of the populace in nations like Bangladesh, China, India, and Nepal continues to use folk and traditional medicine in spite of the progress made in modern medicine. Chinese Pharmacopeia, Arabic Unani, and Indian Ayurveda are the main categories of traditional medicine. The great Ayurvedic texts Charaka Samhita and Anubhoga Vaidya Bhaga go into detail about how to use *vitex negundo* to treat rheumatism, sinusitis, catarrhal fever, syphilitic skin disease, and dysmenorrhea. In Unani medicine, the seeds of *Vitex negundo* are used to treat swellings and as an aphrodisiac. The *Vitex negundo* fruit is used in Chinese medicine to treat headaches, arthritis, and puffy eyes [20]. Chinese Pharmacopeia, Arabic Unani, and Indian Ayurveda are the main categories of traditional medicine. *Vitex negundo* is used to treat sinusitis, syphilitic skin disease catarrhal fever, dysmenorrhea, and rheumatism, according to the great Ayurvedic texts Charaka Samhita and Anubhoga Vaidya Bhaga [21]. In Unani medicine, *Vitex negundo* seeds are used to treat swellings and as an aphrodisiac [22]. The *Vitex negundo* fruit is used in Chinese medicine to treat headaches, arthritis, and puffy eyes [23].

TABLE 3: AYURVEDIC FORMULATIONS CONTAINING *VITEX NEGUNDO* [24]

S. no.	Formulation	Major Plant Drug	Indication
1	*Nirgundi Thailam*	Nirgundi (*Vitex negundo*)	Peenisarogum
2	Nirgundi Patra pinda sweda	Nirgundi (*Vitex negundo*)	Sandhigata vata(osteoarthritis)
3	Nirgundi churna	Nirgundi (*Vitex negundo*)	Kidney pain
4	Dashamoola Taila	Bilva (*Aegle marmelos*)	Kashtartava (dysmenorrhea)
5	Trivikrama Rasa	Nirgundi (*Vitex negundo*), tamra (copper)	Mutrashmari (Urolithiasis)
6	Vishatinduka Taila	Vishatinduka (Strychnous nux-vomica)	Vatarakta (gout)
7	Manasamitra Vataka	Bala moola (Sida acuta)	Generalized anxiety disorder
8	Vatagajankush Rasa	Hartaki (Terminalia Chebula)	Gridhrasi (sciatica)

Traditional Uses: The leaves of *Vitex negundo* were used by Roman women in antiquity to lessen their libido; monks also chewed the plant's berries for the same purpose, which is why it was also known as monks pepper or monks berry. The most ancient Ayurvedic treatise, the Charaka Samhita, describes the applications of *Vitex negundo* and classifies it as a visaghna-antitoxin and a krmighna-anthelminthic. The plant *Vitex negundo* has rasa katu (pungent), tikta (bitter), virya ushna (hot), ruksha (causes dryness), guna laghu (light for digestion), vipaka katu (pungent in post digestion), and doshakarma kapha-vata shamaka, according to the Ayurvedic medical system. Additionally, applying a crushed leaf poultice to pillows filled with *Vitexnegundo* leaves helps treat sinus infections, neck gland sores, tubercular neck swelling, and catarrh and headaches. Rheumatism, irritable bladder, and dysmenorrhea can all be relieved with a solution made from the root bark of *Vitexnegundo*. Gridhrasi can also be effectively treated with the plant's bark. In the Unani medical system, *Vitex negundo* is referred to as Nishinda. It functions as an aphrodisiac when taken with milk and dry ginger; the powdered seeds are used to treat spermatorrhea [25]. Ancient Greek medicine, Chinese traditional medicine, Malay traditional medicine, Ayurveda, Unani medicine, and

European medicine were among the numerous health approaches that acknowledged and used the Vitex plant as a herbal remedy. They listed a variety of ailments for which Vitex can be used, including reproductive difficulties in women, postpartum health, libido suppression, skin issues, gastrointestinal disease symptoms, fever reduction, and rheumatism [26].

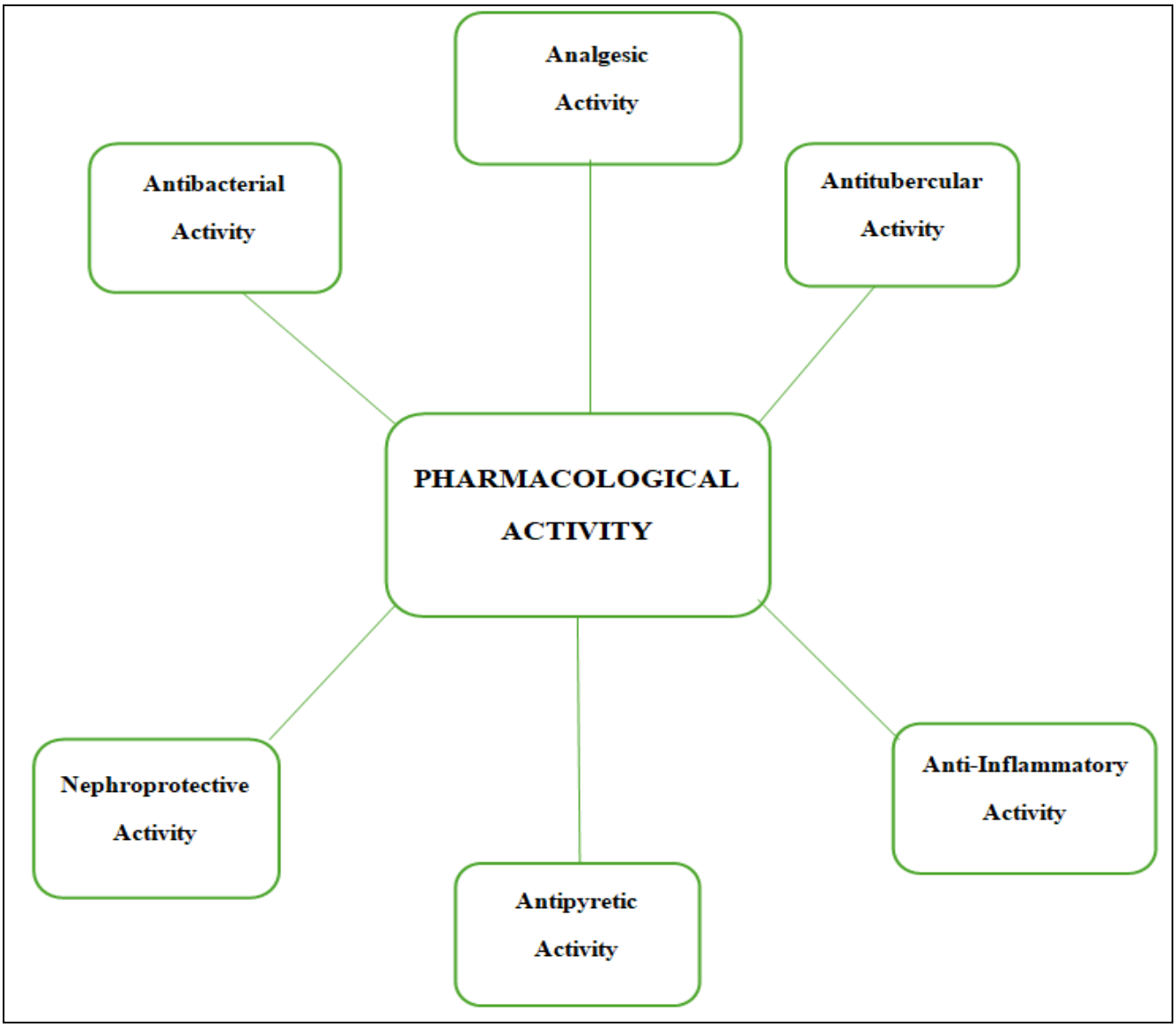

FIG. 4: PHARMACOLOGICAL ACTIVITY OF *VITEX NEGUNDO*

Antibacterial Activity: Disc diffusion method for antibacterial activity: The disc diffusion method was used to test the antibacterial activity of *Vitex negundo*. In order to create solutions with the appropriate concentration, a predetermined volume of solvent was used to dissolve a measured quantity of the test samples. Using a micropipette, the sterile Matricel (BBL, Cocksville, USA) filter paper discs were impregnated with a known quantity of test substances before being dried. The standard dosage was 5µg/disc of ciprofloxacin. The sample, standard, and control disks were then put into 120 mm-diameter petridishes that contained an appropriate agar medium that had been seeded with the test organisms using a sterile transfer loop. After two hours at 40 C to promote maximum diffusion, the plates were placed in an incubator for 12 to 18 hours to allow the microorganisms to grow. The diameter of the zone of inhibition was measured in millimeters following the incubation period.

Analgesic Activity: Using a mouse model of acetic acid-induced writhing, the analgesic properties of the crude extract and fractionated parts were verified. Twelve groups of five mice each were

randomly selected from among the experimental laboratory mice. The first group, which served as the control group, received 10 milliliter per kilogram of body weight of 1% (v/v) Tween-80 diluted in distilled water orally. Standard dosages of diclofenac sodium (25 mg/kg) were administered to the second group. The crude extract was administered to the third group at doses of 250 and 500 mg/kg body weight. Different fractions of crude extract were administered to the fourth through eleventh groups at doses of 250 and 500 mg/kg body weight. Thirty minutes prior to the intraperitoneal injection of 0.7% acetic acid, test samples, the standard medication, and the control vehicle were given orally [27].

Antitubercular Activity: In order to ascertain the antitubercular activity of their isolated compounds using the nitrate reductase assay method, Antitubercular Activity examined the identification, isolation, and characterization of lead constituents. Petroleum ether, chloroform, and methanol were used to separate the ethanol extract from the leaves using Soxhlet extraction. The ethanol extract's petroleum ether and chloroform fractions exhibit anti-tuberculosis properties. According to this study, the ethanolic extract exhibited strong anti-tubercular properties.

Antipyretic Activity: Antipyretic action investigate the antipyretic activity of leaf extracts of *Vitex negundo* Linn by using yeast induced pyrexia model in Wistar Albino rats. According to the data, oral administration of petroleum ether and methanolic extracts of *Vitex negundo* leaves resulted in a significant decrease in yeast-induced elevated temperature. Methanolic and petroleum ether extracts both exhibited strong antipyretic properties [28].

Anti-inflammatory Activity: Dermatitis is an inflammation of the skin, arthritis is an inflammation of the joints, and othitis is an inflammation of the ears. As a result, a compound's anti-inflammatory properties are valued. *Vitex negundo* leaves have anti-inflammatory properties. The carrageenan and formaldehyde models demonstrated the dose-dependent anti-inflammatory properties of mature fresh leaves of *Vitex negundo*. Additionally, mature fresh leaf extract of Vitex negundo showed antihistamine, membrane-stabilizing, and dose-dependent inhibition of prostaglandin (PG) synthesis. Acute anti-inflammatory, antihistamine, PG synthesis inhibition, and membrane stabilizing activities all exhibit an inverse dose-response relationship, which may be caused by the active principle's diminished efficacy at high concentrations [29]. The carrageenan-induced rat paw edema model and the rat peritonitis model were used to assess the acute anti-inflammatory activity of *Vitex negundo* leaves [30].

Anti-Fungal Activity: Bioactivity Together with five other known compounds, a new flavone glycoside was isolated through guided fractionation of an ethanolic extract of *Vitex negundo* Linn. leaves. The antimicrobial properties of each isolated compound were assessed. At MIC 6.25 µg/ml, the novel flavone glycoside and compound 5 demonstrated strong antifungal activity against Trichophyton mentagrophytes and Cryptococcus neoformans [31].

Anti-cancer Activity: The anti-cancer properties of *Vitex-negundo*, or Negundo Chloroform demonstrated potent anticancer effects on some cancer cell lines in the current investigation. ethanol as well as water-based extracts made from *Vitex negundo*. The objective of this work is to extract negundoside from dried *Vitex negundo* leaves and use *in-vitro* MTT (3-(4,5) dimethylthiazol-2-yl)-2,5-diphenyltetrazolium) test and *in-silico* activity to establish its anticancer efficacy [32]. The microculture tetrazolium (MTT) experiment was carried out as previously described in order to evaluate cell viability [33].

Hepatoprotective activity: Recent studies on Negundo demonstrate the drug's many uses. Negundo leaf ethanolic extract shown hepatoprotective properties against hepatotoxicity. According to cell-based testing, the negundo (*vitex negundo*) had the highest estrogenic activity [34].

Immuno-stimulant Activity: *Vitex negundo* extracts were shown to have immunostimulatory action in an oxyburst phagocytic experiment employing human polymorph nuclear cells [35]. According to J.L. Suri *et al.*, two iridoid glucosoides from Vitex negundo leaves have immunostimulatory properties [36].

TABLE 4: *VITEX NEGUNDO* PARTS AND USES [37]

S. no.	Plant Part	Used Form	Disease/Usage
1	Flower	As Astringent and tonic	Fever, Cholera, Gastrointestinal disorders, Diarrhea, Jaundice/ Liver disorders
2	Leaf	Leaf juice	Common cold, Flu, Sore throat, Whooping cough, Respiratory disorders, Cough, Dysmenorrhea, Gonorrhea, Dysfunctional uterine, Rheumatism, Gout, Wounds and ulcers, As Diuretic, Insecticide
3	Root	Powdered form	Dyspepsia, Colic, Dysentery, Piles, Skin diseases, Eczema, Carbuncles, Abscesses, Leprosy, Rheumatism
4	Stem and Bark	Decoction As Tincture	Burns, Cancer Flatulence/ Irritable bladder, Dysentery, Rheumatism

Toxicity of *Vitex negundo*: Tandon and Gupta's preliminary acute toxicity study of ethanolic leaf extract administered orally to albino rats showed that it was essentially nontoxic, with an LD_{50} dose of 7.5 g/kg/wt. No histomorphological alterations were observed in the stomach at any of the extract dosages examined. However, the liver, lung, and heart specimens showed dose-dependent histomorphological changes [37].

CONCLUSION: *Vitex negundo* offers promising antioxidant and anti-inflammatory potential, with adjunctive benefits in antimicrobial and anticancer areas. More targeted clinical studies are needed to confirm efficacy. *Alstonia scholaris* exhibits a multifaceted therapeutic profile, especially in respiratory health, pain/inflammation modulation, GI relief, and neuroprotection. Early clinical data on safety is encouraging, but continued research is required to define optimal dosing, safety thresholds, and therapeutic indications.

ACKNOWLEDGEMENT: Nil

CONFLICT OF INTEREST: Nil

REFERENCES:

1. Verma PK, Tukra S, Singh B, Sharma P, Abdi G and Bhat ZF: Unveiling the ethnomedicinal potential of *Alstonia scholaris* (L.) R. Br.: A comprehensive review on phytochemistry, pharmacology and its applications. Food Chemistry Advances 2025; 6: 100866.
2. Majid A and Faraj HR: A review Study of the Chemical Constituents and Pharmacological Activities of *Alstonia scholaris* linn. University of Thi-Qar Journal of Science 2023; 10(1): 81-6.
3. Venkateswarlu K: *Vitex negundo*: Medicinal values, biological activities, toxicity studies and phytopharmacological actions. International Journal of Pharmaceutical and Phytopharmacological Research 2012; 2(2): 126-33.
4. Akbar I, Mullaivendhan J, Ahamed A and Aljawdah HM: Vitex Negundo–Fe 3 O 4–CuO green nanocatalyst (VN–Fe 3 O 4–CuO): synthesis of pyrazolo [3, 4-c] pyrazole derivatives *via* the cyclization of isoniazid with pyrazole and their antimicrobial activity, cytotoxicity, and molecular docking studies. RSC Advances 2024; 14(1): 677-88.
5. Chhajed M, Jain A, Pagariya A, Dwivedi S, Jain N and Taile V: *Alstonia scholaris* Linn. R. Br.: An Assessment of its Botany, Conventional Utilizaton, Phytochemistry and Pharmacology. Pharmacognosy Reviews 2023; 17(33): 184-203.
6. De S, Das R, Adhikari M, Ghosh P, Mohanty JP and Sharma C: An updated review on *Alstonia scholaris*: A delightful therapeutic plant. Journal of Medicinal Plants Studies 2024; 12(2): 43-51.
7. Dey A, Bhattacharya R, Mukherjee A and Pandey DK: Natural products against Alzheimer's disease: Pharmaco-therapeutics and biotechnological interventions. Biotechnology Advances 2017; 35(2): 178-216.
8. Khatale VL and More DB: A Review on Saptaparna (*Alstonia scholaris* R. Br). International Ayurvedic Medical Journal 2016; 4(03): 334-7.
9. Prakash D, Bisht D and Shakya AK: Medicinal properties and phytoconstituents of *Alstonia scholaris*: A review. Int J Res 2020; 11: 1.
10. Nalra N, R Vasudevan, Hasan I, Tha A and Dhiman A: Review of *Alastonia schoris* an Approach with Ayush Sharma of Medicine 2023; 3: 2582-9114.
11. N, Kirby GC, Steele JC and Houghton PJ: Antiplasmodial activity of extracts and alkaloids of three alstonia species from Thailand. Planta Med 1999; 65(8): 690-4. doi: 10.1055/s-1999-14043, PMID 10630106.
12. Gandhi M and Vinayak VK: Preliminary evaluation of extracts of *Alstonia scholaris* bark for *in-vivo* antimalarial activity in mice. J Ethnopharmacol 1990; 29(1): 51-7. doi: 10.10 16/0378-8741(90)90097-d, PMID 2345460.
13. Gupta RS, Bhatnager AK, Joshi YC, Sharma MC, Khushalani V and Kachhawa JB: Induction of antifertility with lupeol acetate in male albino rats. Pharmacology 2005; 75(2): 57-62. doi: 10.1159/000086947, PMID 16015025.
14. Gupta RS, Bhatnager AK, Joshi YC, Sharma R and Sharma A: Suppression of fertility in male albino rats following α-amyrin acetate administration. Pharm Biol 2004; 42(2): 98-104. doi: 10.1080/13880200490510793.
15. Gupta RS, Sharma R, Sharma A, Bhatnager AK, Dobhal MP and Joshi YC: Effect of *Alstonia scholaris* bark extract on testicular function of Wistar rats. Asian J Androl 2002; 4(3): 175-8. PMID 12364971.
16. Singha UK, Guru PY, Sen AB and Tandon JS: Antileishmanial activity of traditional plants against *Leishmania donovani* in golden hamsters. International Journal of Pharmacognosy 1992; 30(4): 289-95. doi: 10.3109/13880209209054015.

17. Lin SC, Lin CC, Lin YH, Supriyatna S and Pan SL: The protective effect of *Alstonia scholaris* R. Br. on hepatotoxin-induced acute liver damage. Am J Chin Med 1996; 24(2): 153-64.
18. Baliga MS, Jagetia GC, Ulloor JN, Baliga MP, Venkatesh P and Reddy R: The evaluation of the acute toxicity and longterm safety of hydroalcoholic extract of Sapthaparna (*Alstonia scholaris*) in mice and rats. Toxicol Lett 2004; 151(2): 317-26.
19. Jagetia GC and Baliga MS: Induction of developmental toxicity in mice treated with *Alstonia scholaris* (Sapthaparna) in utero. Birth Defects Res B Dev Reprod Toxicol 2003; 68(6): 472-8. doi: 10.1002/bdrb.10047, PMID 14745981.
20. Designing W and Agrawal CP: Makhanlal Chaturvedi National U Department of C Bachelor of NEP-based Full-Time Degree Program-with multi Graduate Degree after 3 years, and after 4th year Honors Gradua.
21. Sharma PV: Caraka Samhita, Chaukhamba Orientalia; 2005.
22. Khare CP: Encyclopedia of Indian Medicinal Plants, Springer, Berlin 2004.
23. Liu C, Tseng A and Yang S: Chinese herbal medicine. Modern applications of traditional formulas. CRC Press 2005.
24. Ganjewala D and Gupta AK: Study on phytochemical composition, antibacterial and antioxidant properties of different parts of *Alstonia scholaris* Linn. Advanced Pharmaceutical Bulletin 2013; 3(2): 379.
25. Neha B, Jannavi R and Sukumaran P: Phyto-pharmacological and biological aspects of *Vitex negundo* medicinal plant-A review. Cardiovasc Dis 2021; 6(7).
26. Perveen S, Khan MA, Parveen R, Insaf A, Parveen B, Ahmad S and Husain SA: An updated review on traditional and modern aspects of *Vitex negundo*. Current Traditional Medicine 2023; 9(2): 114-27.
27. Kamal N, Mio Asni NS, Rozlan IN, Mohd Azmi MA, Mazlan NW, Mediani A, Baharum SN, Latip J, Assaw S and Edrada-Ebel RA: Traditional medicinal uses, phytochemistry, biological properties, and health applications of *Vitex sp*. Plants 2022; 11(15): 1944.
28. Neha K, Vasudev RN, HIzharul, Tha gee A and Dhiman A: Review of *Alastonia scholaris*-An Approach with Ayush System of Medicine 2023; 3(2): 2582-9114.
29. Sultana NA, Aovi FI, Shaima SJ and Chakma P: Bioactivities of *Vitex negundo* (Linn) leaf Crude and Fractionated extracts. Research Journal of Pharmacy and Technology 2022; 15(12): 5682-8.
30. Singh Y, Mishra P and Kannojia P: Morphology, phytochemistry and pharmacological activity of *Vitex negundo*: an overview. Journal of Drug Delivery and Therapeutics 2020; 10(3): 280-5.
31. Paarakh PM, Sreeram DC, Shruthi SD & PS PG: *In-vitro* and *in-silico* anticancer activity of negundoside isolated from leaves of *Vitex negundo* Linn. European Journal of Biomedical and Pharmaceutical Sciences 2017; 4(02): 349-354.
32. Wajapeyee N, Britto R, Ravishankar HM and Somasundaram K: Apoptosis induction by activator protein 2α involves transcriptional repression of Bcl2. J Biol Chem 2006; 281: 16207−16219.
33. Ladda PL, Magdum CS and Naikwade NS: Hepatoprotective activity of *Vitex negundo* by Paracetamol induced Hepatotoxicity in rats. Int J Pharmacology Res 2011; 1: 1-9.
34. Tondon VR and Gupta RK: *Vitex negundo* Linn (VN) leaf extract as an adjuvant therapy to standard anti inflammatory drugs. Indian J Med Res 2006; 124: 447-450.
35. Singh DD. Chitra G and Singh IP: Immuno stimulatory compounds from *Vitex negundo*. Indian Journal of Chemistry 2005; 44(6): 1288-1290.
36. Nguyen TT, Do PT, Pham AV, Nguyen HG, Nguyen LN and Nguyen TT: Phytochemical investigation on *Vitex negundo* leaves and their anti-inflammatory and analgesic activities. Brazilian Journal of Pharmaceutical Sciences 2022; 58: 19463.
37. Venkateswarlu K: *Vitex negundo*: Medicinal values, biological activities, toxicity studies and phytopharmacological actions. International Journal of Pharmaceutical and Phytopharmacological Research 2012; 2(2): 126-33.

How to cite this article:
Sharma C, Devi M, Verma KK and Sharma A: A review on pharmacological activities of *Alastonia* and *Vitex negundo*. Int J Pharmacognosy 2025; 12(9): 716-24. doi link: http://dx.doi.org/10.13040/IJPSR.0975-8232.IJP.12(9).716-24.