
**VITEX NEGUNDO LINN.: TRADITIONAL MEDICINE,
PHARMACEUTICAL FORMULATIONS AND EMERGING
RESEARCH TRENDS**

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ABSTRACT

Vitex negundo Linn., more commonly called Nirgundi, is a major medicinal plant, and it is used widely in traditional healthcare systems like Ayurveda, Siddha, Unani and also folk medicine. This plant has a long background of ethnomedicinal use, and in everyday practice it has been traditionally applied in many types of herbal preparations, you know. In the last few years, new progress in pharmaceutical technology has pushed researchers to craft modern dosage forms such as tablets, capsules, syrups, skin applied products, and also newer drug delivery systems. At the same time, newer studies keep moving toward standardization and better quality control, along with ideas for sustainable utilization. More recently nanotechnology based formulations get attention too, plus work on herbal products that can hold stability for longer periods and stay effective. So, this review basically brings together the traditional importance of *Vitex negundo* Linn., the ways it is being formulated in pharmacy, and the latest research advances. By combining age-old knowledge with modern scientific methods, there seem to be promising chances to develop herbal formulations that are safe, effective, and properly standardized, for upcoming healthcare needs.

KEYWORDS: *Vitex negundo* Linn.; Nirgundi, Traditional Medicine, Herbal Formulations, Drug Delivery Systems, Emerging Research Trends.

INTRODUCTION

Vitex negundo Linn., which people commonly call Nirgundi, is a medicinal plant that has been used for ages in traditional healthcare. It sits in the Lamiaceae family (it was once placed under Verbenaceae), and it shows up across many tropical and subtropical zones in Asia like India, Sri Lanka, Bangladesh, Nepal, China, Thailand, Malaysia, and the Philippines. This plant is pretty adaptable, usually it can be found along roadsides, river edges, barren grounds, forest margins, and also in places where people cultivate crops. Because it has such a long track record in medicine, *Vitex negundo* holds a notable spot in Ayurveda, Siddha, Unani, and in different folk healing traditions. In most cases, leaves, roots, bark, flowers, fruits, and seeds are used in older herbal preparations to help with various health issues. Basically, medicinal plants have supported healthcare for a very long time, giving options that are often affordable and easy to access. Traditional medicine still acts as a main health resource for many communities, especially in developing regions. India in particular has a strong herbal medicine legacy, built on long-standing knowledge and practices that were recorded over time. Among many medicinal plants in Indian systems, *Vitex negundo* stands out a lot, mainly because it is easy to find and has broad traditional use. It has been used traditionally for pain, inflammation, fever, problems related to respiration, skin ailments, wounds, digestive complaints, rheumatic disorders, and also for women's health needs. The ethnomedicinal relevance of *Vitex negundo* is not only limited to one area, it extends across different Asian countries where it gets blended into local health practices. In Ayurveda, it is often valued for inflammatory disorders, joint discomfort, arthritis, cough, asthma, sinusitis, and even neurological complaints. Siddha mainly uses the leaves and roots in multiple formulations, aimed at skin infections, fever, swelling, breathing related issues, and long term pain. Unani, on the other hand, acknowledges *Vitex negundo* for its customary use in inflammatory conditions, digestive problems, reproductive health concerns, and for managing pain too. In rural settings, fresh leaves are commonly set directly as poultices for wounds, insect bites, sprains, and swollen joints, while leaf decoctions are taken for fever, cough, and general wellbeing maintenance. Because herbal medicines are getting more attention worldwide, scientists and pharmaceutical industries are trying to investigate medicinal plants for more standardized herbal products. People are now asking for more natural, plant based healthcare items, not only because they tend to be cheaper, but also due to cultural familiarity, and possible advantages. Because of that *Vitex negundo* has drawn scientific focus as it shifts from home grown remedies toward modern medicine forms. Traditional preparations like decoctions, powders, herbal oils, and pastes are being

reconsidered and turned into more developed dosage forms such as tablets, capsules, syrups, creams, gels, ointments, and other topical formats. Recent improvements in pharmaceutical technology have also widened how *Vitex negundo* can be used via newer drug delivery methods. Things like nanoparticles, nanoemulsions, liposomes, phytosomes, and transdermal approaches are being examined, mainly to boost stability, increase bioavailability, and improve therapeutic outcomes. Still, bigger issues—like standardization, quality control, safety evaluation, and regulatory acceptance—remain key obstacles in herbal drug development. Differences in how it is grown, when it is harvested, how it is extracted, and how it is processed can change the final product consistency, so validated manufacturing and quality assurance become essential. Newer studies around *Vitex negundo* are looking at herbal nanotechnology, sustainable cultivation, enhanced extraction strategies, nutraceutical development, cosmetic uses, and integrative healthcare concepts. Work across multiple fields such as pharmacognosy, pharmaceuticals, biotechnology, and clinical sciences is helping shape better herbal products. So, this review is intended to give an overview of *Vitex negundo* Linn., emphasizing its value in traditional medicine, its roles in pharmaceutical formulation approaches, and the emerging directions in research. It also underlines why scientific validation and careful modernization of traditional knowledge matters, so future herbal healthcare products can be safe, effective, and standardized.



Fig 1: Introduction of *vitex negundo linn.*

TRADITIONAL MEDICINE AND ETHNOMEDICINAL USES OF *VITEX NEGUNDO* LINN.

Vitex negundo Linn., usually called Nirgundi, is some kind of important medicinal plant that people in traditional healthcare have used for a long time, like for centuries. It plays a big part in Ayurveda, Siddha, Unani, and also in folk medicine, because it has many therapeutic uses and is easy to get. Different parts of this plant, including leaves, roots, bark, flowers, fruits, and seeds, are used separately or sometimes together, to make herbal remedies. Traditional healers relied on *Vitex negundo* for dealing with a range of health issues, and that kind of local know-how has been kept over generations, specially in rural and tribal areas. In Ayurveda, *Vitex negundo* is looked at as a valuable medicinal herb, used traditionally for keeping the body in a sort of stable state and also to handle pain and inflammatory conditions. Leaf decoctions are often taken for respiratory troubles like cough, cold, asthma, bronchitis, and fever. Herbal oils made from the leaves are commonly used for massage, especially in arthritis, rheumatism, joint stiffness, and muscular pain. Warm leaf poultices are traditionally placed over swollen joints, sprains, and sore places, just to give relief. Root preparations show up in older practices for digestive disorders, urinary problems, and general health improvement. The Siddha system also treats *Vitex negundo* as an important herbal drug. Siddha practitioners use leaves, roots, bark, and seeds in different formulations, for inflammatory disorders, skin issues, respiratory complaints, and chronic pain. Leaf paste is applied externally for wounds, boils, insect bites, and skin infections. Steam inhalation from boiled leaves is done traditionally too, for sinus congestion, headache, and respiratory discomfort. Leaf decoctions are also used for fever, body pain, digestion problems, and women's health related conditions. In Unani medicine, *Vitex negundo* is traditionally valued for reducing pain, swelling, and inflammatory disorders. Preparations from leaves and roots are used for arthritis, neuralgia, muscular pain, respiratory disorders, digestive complaints, and issues related to reproduction. The plant is also a notable part of folk medicine, where rural communities use fresh leaf paste for wounds, burns, bruises, insect bites, and skin infections. Warm leaf compresses are placed for joint pain, sprains, and muscular stiffness. Dried leaves are sometimes used as natural insect repellents as well, like without much fuss. *Vitex negundo* also shows up in ethnoveterinary practices, where farmers use leaf preparations for treating wounds, skin infections, inflammation, and insect related problems in domestic animals. Beyond the health uses, the plant carries cultural weight in several regions, because people grow it near homes and community places, tied to the traditional belief about protection and wellbeing. With the rising interest in traditional medicine, there

has been more push for scientific documentation and for checking whether the ethnomedicinal uses hold up. Researchers are investigating these customary applications, hoping to make standardized herbal products and modern healthcare options. So, overall, *Vitex negundo* Linn. still stands as an important medicinal plant, thanks to its long record of use, cultural relevance, and possible contribution to sustainable herbal medicine development.

Table 1: Traditional medicine and ethnomedicinal uses of *vitex negundo* linn.

Traditional System / Area	Plant Part Used	Traditional Uses / Applications
Ayurveda	Leaves	Leaf decoctions are traditionally used for respiratory problems such as cough, cold, asthma, bronchitis, and fever. Leaf preparations are also used for pain and inflammatory conditions.
		Herbal oils prepared from leaves are used for massage in arthritis, rheumatism, joint stiffness, and muscular pain. Warm leaf poultices are applied on swollen joints, sprains, and painful areas for relief.
	Roots	Root preparations are traditionally used for digestive disorders, urinary problems, and general health improvement.
Siddha Medicine	Leaves, roots, bark, and seeds	Used in various formulations for inflammatory disorders, skin diseases, respiratory problems, and chronic pain management.
	Leaves	Leaf paste is externally applied for wounds, boils, insect bites, and skin infections. Steam inhalation from boiled leaves is used for sinus congestion, headache, and respiratory discomfort.
		Leaf decoctions are traditionally used for fever, body pain, digestive disorders, and women's health-related conditions.
Unani Medicine	Leaves and roots	Preparations are used for reducing pain, swelling, inflammation, arthritis, neuralgia, muscular pain, respiratory disorders, digestive complaints, and reproductive health issues.
Folk Medicine	Fresh leaves	Leaf paste is applied on wounds, burns, bruises, insect bites, and skin infections.
	Leaves	Warm leaf compresses are used for joint pain, sprains, and muscular stiffness. Dried leaves are also used as natural insect repellents.
Ethnoveterinary Practices	Leaves	Leaf preparations are used by farmers for treating wounds, skin infections, inflammation, and insect-related problems in domestic animals.
Cultural Importance	Whole plant	The plant is commonly grown near houses and community areas due to traditional beliefs associated with protection, health, and wellbeing.

Modern Herbal Research	Leaves, roots, bark, flowers, fruits, and seeds	Scientific studies are being conducted to validate traditional uses and develop standardized herbal products for sustainable healthcare applications.
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PHARMACEUTICAL FORMULATIONS OF VITEX NEGUNDO LINN.

The pharmaceutical use of *Vitex negundo* Linn. has moved, kind of gradually, from the old traditional preparations into newer herbal dosage forms that are made to boost stability, help patient compliance, improve therapeutic effectiveness and also make it easier to administer. In the past, people would put different parts of the plant into rough preparations like decoctions, infusions, powders, pastes, and medicated oils. Now, with more pharmaceutical technology involved, *Vitex negundo* is being turned into standardized formats such as tablets, capsules, syrups, and also topical products, for example gels, creams, ointments, and even advanced drug delivery systems. The whole point is to take what was known traditionally and turn it into herbal products that are more scientifically acceptable, with better quality control and reproducibility.

Decoctions and Extract-Based Preparations: Decoction is probably one of the oldest, and still very common, herbal forms of *Vitex negundo* in traditional medicine. Fresh or dried leaves, roots, or bark are boiled in water to pull out the medicinal components, then the preparation is taken for various health issues. Leaf decoctions have been used traditionally for respiratory discomfort, fever, body pain, and inflammatory complaints. Meanwhile extract-based preparations are made by using suitable solvents such as ethanol, methanol, or water, to make concentrated extracts that can later be placed into different dosage forms. These extracts usually give better batch consistency than crude plant material and they also become valuable raw material when someone is developing standardized herbal products.

Tablets and Capsules: Oral solid dosage forms like tablets and capsules, which contain *Vitex negundo* extracts or powders, have been widely developed because they are easy to take, dosing is more accurate, shelf life is longer, and patients often accept them better. Herbal tablets made from *Vitex negundo* leaf powder or from standardized extracts are commonly prepared for systemic use. Capsules containing dried plant extracts work as a good alternative, especially for patients who prefer more natural products, plus the active plant components are better protected. These kinds of formulations are sometimes mixed with other medicinal herbs, to support broader therapeutic effects, and then they're sold as herbal supplements, or sometimes simply as traditional medicine products.

Herbal Syrups and Liquid Formulations: Liquid products such as syrups and herbal tonics that contain *Vitex negundo* extracts are often designed for people who find swallowing solid forms difficult, especially children, and also some elderly individuals. These preparations generally include aqueous extracts from leaves or roots, along with sweetening agents, preservatives, and flavoring materials, so the taste feels better and the product stays stable. Traditionally, *Vitex negundo*-based syrups have been used for respiratory health, cough, cold, and throat irritation. In modern herbal syrup development, a major focus is on keeping extract uniformity, while also ensuring an acceptable taste and consistent therapeutic performance.

Medicated Oils and Liniments: Medicated oils are among the most important traditional pharmaceutical uses of *Vitex negundo*. The leaves plus other plant parts are processed with suitable oils like sesame oil or coconut oil to produce herbal oils, meant mainly for external use. These oils are traditionally rubbed or applied through massage for joint pain, muscular stiffness, arthritis, sprains, and inflammatory related problems. Liniments containing *Vitex negundo* extracts are formulated for external application as well, and they provide more localized relief by allowing better absorption in the affected area. These preparations keep being popular in Ayurvedic and Siddha practices, partly because they are simple to prepare and because there's a long record of use.

Creams, Ointments, and Gels: Topical formulations that carry *Vitex negundo* extracts have gained attention, mainly because they could work for dermatological care, and for localized treatments too. Creams and ointments are made by combining plant extracts into semisolid bases, so the products spread properly on skin and stay in place. Traditionally they have been used for wound care, skin irritation, insect bites, and inflammatory skin conditions. Herbal gels with *Vitex negundo* extracts offer benefits like a less greasy feel, faster absorption, and better comfort for patients. Developing these topical options can be seen as a way to link traditional external applications with modern pharmaceutical formulation methods.

Transdermal Preparations: Recent progress in herbal drug delivery has encouraged systems where *Vitex negundo* extracts are delivered transdermally. Transdermal patches and similar skin delivery mechanisms are built to provide controlled release, letting herbal components pass through the skin in a way that may improve therapeutic duration, while also reducing repeated dosing. To make these work, it's necessary to carefully pick polymers, permeation enhancers, and formulation settings. Even though this is still an emerging area, transdermal technology seems to offer encouraging chances for improving *Vitex negundo*'s clinical use.

Nano-Based Formulations: Nanotechnology has opened up fresh opportunities for improving how herbal medicines perform. Nanoemulsions, nanoparticles, liposomes, and

phytosome-based formulations that include *Vitex negundo* extracts are being studied, with the aim to increase solubility, stability, absorption, and bioavailability of plant-derived compounds. These advanced delivery systems may help overcome some weaknesses found in standard herbal preparations, like poor water solubility and inconsistent absorption. Placing *Vitex negundo* into nanocarrier systems can therefore be viewed as an innovative pathway toward next-generation herbal therapeutics.

Cosmetic and Personal Care Formulations: Because *Vitex negundo* is traditionally used in skin and hair care, it has been folded into cosmetic formulations as well. Herbal creams, lotions, gels, face packs, and hair care items that include *Vitex negundo* extracts are now being looked at for their possible roles in personal care. In practice, these products are designed by mixing a kind of age-old plant based know how with newer cosmetic technology, so the outcome feels more natural and acceptable to consumers. Turning *Vitex negundo* from folk remedies into modern pharmaceutical formulations also shows how important it is for herbal drug development. Still, there are several issues that need attention such as standardizing the extracts, choosing the right dosage forms, checking stability, enforcing quality control, and achieving regulatory approval, before safe and effective products can really move forward. More future work, especially on improved formulation strategies and clinical validation, should sharpen the pharmaceutical value of *Vitex negundo* Linn. and help it become part of today's healthcare systems.



Fig 2: Pharmaceutical formulations of *vitex negundo* linn.

EMERGING RESEARCH TRENDS AND RECENT ADVANCES IN *VITEX NEGUNDO* LINN.

In recent years , *Vitex negundo* Linn. has gotten a lot of scientific attention, largely because of its traditional medicinal value and what it might do for modern healthcare. Most of the current work seems to revolve around taking old herbal knowledge and turning it into products that are actually backed up by evidence. That includes new formulation technologies , better ways to standardize, and more thoughtful utilization so the plant is used in a way that doesn't drain everything. The overall aim is to boost quality, improve stability, keep safety in check, and make these *Vitex negundo* based herbal products more acceptable to people in real life. Modern pharmaceutical technologies have also showed up as a major helper here, specially for raising the effectiveness of herbal formulations. Traditional preparations can run into issues like inconsistent composition, not so great stability, and dosing that doesn't always match from batch to batch. Because of that, scientists are looking into drug delivery systems that are a bit more advanced , for example nanoparticles, nanoemulsions, liposomes, and phytosomes. These strategies basically support better stability, stronger absorption, and more reliable delivery of plant extracts, so the door opens for herbal medicines that can work more consistently. Another big research theme is standardization and quality control for *Vitex negundo* products. Researchers are using modern analytical methods not just for authentication, but also for quality assessment, and to make sure every batch is comparable. When standardization is done well , it helps keep product safety solid, makes results reproducible, and helps with meeting regulatory needs too. That kind of consistency is what builds consumer confidence, since people expect herbal medicines to be dependable, not a surprise. At the same time , sustainable cultivation and conservation of *Vitex negundo* are getting more attention due to the increasing demand for medicinal plants. Studies are exploring upgraded cultivation practices, harvesting that is more optimized, and processing methods that are eco-friendly. The idea is to keep supplying high quality plant material steadily, while also protecting natural resources, and not just harvesting without thought. More recently , biotechnology and interdisciplinary research have widened what scientists can explore with *Vitex negundo*. There's an integration of pharmacognosy, pharmaceuticals, biotechnology, and clinical research, and this has encouraged new directions for inventive herbal products. People are testing improved extraction methods, doing molecular investigations, and even using computational approaches. All of this is meant to clarify mechanisms and optimize how this medicinal plant can be used. There's also a noticeable trend in putting *Vitex negundo* into nutraceuticals, cosmeceuticals , and personal care

products. With more consumers leaning toward natural , plant based options, industries in both pharma and cosmetics are developing formulations that include *Vitex negundo* extracts. The goal is mostly healthcare support and wellness oriented benefits. Even with all that progress, some hurdles are still hanging around, like clinical validation, regulatory approval, safety evaluation, and scaling up for large scale production. Future research should keep pushing toward standardized, evidence based, and commercially practical formulations. With collaborative scientific efforts, it should be possible to narrow the gaps. Taken together, combining traditional knowledge with modern pharmaceutical innovation keeps pointing to a promising future for *Vitex negundo* Linn. in producing safe, effective, and sustainable herbal healthcare products.

Table 2: Emerging research trends and recent advances in *vitex negundo* linn.

Research Area	Recent Developments / Scientific Approaches	Importance and Future Potential
Modern Herbal Product Development	Traditional knowledge of <i>Vitex negundo</i> is being transformed into evidence-based herbal products using advanced formulation technologies and improved utilization methods.	Enhances product quality, stability, safety, and acceptance in modern healthcare systems.
Advanced Drug Delivery Systems	Development of nanoparticles, nanoemulsions, liposomes, and phytosome-based formulations containing <i>Vitex negundo</i> extracts.	Improves solubility, stability, absorption, bioavailability, and therapeutic effectiveness of plant-derived compounds.
Standardization and Quality Control	Use of modern analytical techniques for authentication, identification of bioactive markers, and batch-to-batch quality assessment.	Ensures reproducibility, safety, regulatory compliance, and consumer confidence in herbal products.
Sustainable Cultivation and Conservation	Research focuses on improved cultivation practices, optimized harvesting methods, and eco-friendly processing techniques.	Ensures continuous availability of high-quality plant material while protecting natural resources.
Biotechnology and Interdisciplinary Research	Integration of pharmacognosy, pharmaceutics, biotechnology, molecular studies, and computational approaches.	Helps understand mechanisms of action and supports development of innovative herbal formulations.
Improved Extraction Technologies	Investigation of advanced extraction methods to obtain enriched and standardized bioactive compounds.	Provides better yield, purity, and therapeutic potential of <i>Vitex negundo</i> extracts.
Molecular and Pharmacological Studies	Molecular investigations are performed to explore biological pathways and therapeutic mechanisms.	Supports scientific validation of traditional medicinal claims.
Nutraceutical Development	Incorporation of <i>Vitex negundo</i> extracts into health supplements and	Provides natural options for health promotion and

	wellness products.	preventive healthcare.
Cosmeceutical and Personal Care Applications	Development of herbal creams, lotions, gels, and personal care products containing <i>Vitex negundo</i> extracts.	Utilizes its traditional skin and hair care benefits for modern cosmetic applications.
Clinical Validation and Safety Evaluation	Studies are focusing on clinical trials, toxicity assessment, and therapeutic evaluation.	Essential for establishing safe, effective, and scientifically approved herbal medicines.
Commercial Scale Production	Research aims at large-scale manufacturing of standardized <i>Vitex negundo</i> formulations.	Supports industrial development and wider availability of herbal healthcare products.
Future Prospects	Collaboration among traditional medicine experts, researchers, pharmaceutical industries, and regulatory bodies.	Helps bridge the gap between traditional knowledge and modern evidence-based medicine for sustainable healthcare development.

CONCLUSION

Vitex negundo Linn. it keeps being viewed as an important medicinal plant because it gets used in traditional medicine a lot, and at the same time it has more and more attention in modern pharmaceutical research. In Ayurveda, Siddha, Unani, folk medicine and also in ethnoveterinary practices, it seems to keep showing a useful presence for healthcare. When older, traditional preparations are reshaped into more modern pharmaceutical formats ,like tablets, capsules, topical items, and even more advanced delivery systems, this also shows a promising route for future treatment development. Lately, the research themes that people are following—standardization, nanotechnology, sustainable cultivation and better quality checking—open up fresh possibilities to increase both safety and effectiveness of products made from *Vitex negundo*-based plant material. Even so, more work is still needed, including clinical proof, regulatory evaluation ,and large scale formulation progress. By tying inherited knowledge with advanced scientific methods, it may become easier to craft standardized, evidence based, eco-friendly herbal products from *Vitex negundo* Linn. so they can support future healthcare requirements.

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