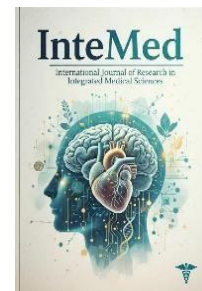




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Review Article

Nirgundi (*Vitex negundo* Linn.): An Ayurvedic Dravyaguna Perspective Integrating Rasa-Panchaka, Classical Therapeutics, Phytochemistry and Modern Pharmacological Evidence – A Comprehensive Review.

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Abstract: Nirgundi (*Vitex negundo* Linn.) is a well-established Ayurvedic medicinal plant whose traditional use is particularly

associated with Vata-Kapha predominant disorders, pain, swelling and inflammatory conditions. The present review

reorganizes classical Dravyaguna information alongside contemporary botanical, phytochemical and pharmacological

observations. Classical descriptions concerning Rasa-Panchaka, Karma and therapeutic indications are considered

together with modern reports on constituents and biological activities. Published investigations describe flavonoids,

lignans, iridoids, terpenoids, triterpenoids and phenolic compounds in different plant parts and preparations.

Experimental studies have explored anti-inflammatory, analgesic, antioxidant, antimicrobial, hepatoprotective,

cardioprotective and metabolic activities. These findings may provide supportive research perspectives for several

traditional applications, but preclinical observations should not be equated with established clinical efficacy. Differences

in plant material, extraction procedures, dose, experimental model and analytical methods also limit direct comparison

among studies. Future work should emphasize botanical authentication, preparation standardization, pharmacokinetic

evaluation, safety assessment and properly designed clinical studies.

Keywords: *Nirgundi*; *Vitex negundo* Linn.; *Dravyaguna*; *Rasa-Panchaka*; *Ayurveda*; *phytochemistry*; *pharmacological*

activity; anti-inflammatory; analgesic; antioxidant.

INTRODUCTION

Medicinal plants form an important bridge between traditional therapeutic knowledge and contemporary

pharmacological research. Nirgundi, botanically identified as *Vitex negundo* Linn., is an aromatic shrub or small tree

used in Ayurveda and other traditional systems. Classical descriptions associate the drug especially with Vata-Kapha

related conditions, painful and inflammatory disorders, selected wounds, ear disorders and other therapeutic situations.

Ayurvedic reviews describe Katu, Tikta and Kashaya Rasa, Laghu and Ruksha Guna, Ushna Virya and Vata-Kaphahara action. Activities such as Deepana, Krimighna, Kushthagha, Shothahara and Shulahara are also reported in the

classical literature. [1,2]

Contemporary investigations have broadened the scientific profile of Nirgundi. Studies have reported several classes of secondary metabolites, including flavonoids, lignans, iridoids, terpenoids, triterpenoids and phenolic compounds.

Experimental work has examined anti-inflammatory, analgesic, antioxidant, antimicrobial, hepatoprotective and cardioprotective effects, among others. [3–6] These observations are useful for generating research hypotheses, while

the traditional Ayurvedic framework and modern pharmacological framework should be interpreted according to their

respective evidence systems.

AIM

The aim of this review is to present a structured account of Nirgundi (*Vitex negundo* Linn.) covering its botanical identity,

Ayurvedic description, Rasa-Panchaka, classical therapeutic applications, useful parts, phytochemical profile,

experimentally investigated pharmacological activities, safety considerations and future research needs.

METHODOLOGY

A narrative literature review was prepared using Ayurvedic classical texts, Nighantus and published scientific literature.

Information relevant to botanical identity, traditional description, Rasa-Panchaka, therapeutic use, phytochemistry,

pharmacological activity and safety was identified and organized thematically. Contemporary evidence was considered

as experimental or scientific evidence, whereas classical descriptions were retained as traditional Ayurvedic evidence.

The available literature was interpreted with attention to limitations arising from differences in plant parts, extraction methods, experimental models, dosage and study design.

DETAILED REVIEW OF NIRGUNDI (*Vitex negundo* Linn.)

1. Botanical Description

Vitex negundo Linn. belongs to the genus *Vitex* and is commonly encountered as a shrub or small tree. It is distributed

in India and other parts of South and Southeast Asia. Modern botanical descriptions note aromatic foliage, compound

leaves—often with five leaflets—and bluish-purple flowers. The species occurs in varied habitats, including open areas,

humid localities and regions close to streams. [3,4]

2. Ayurvedic Description

Nirgundi, also referred to as Sindhuvara in Ayurvedic literature, is described in the Brihatrayi and in several Nighantus.

Its therapeutic interpretation is based on the combined assessment of Rasa, Guna, Virya, Vipaka and Dosha Karma.

Classical review literature records Katu, Tikta and Kashaya Rasa, Laghu-Ruksha Guna and Ushna Virya, with

Vata-Kaphahara action. Deepana, Krimighna, Kushthagha, Medhya, Shothahara and Shulahara properties and uses in

Vatavyadhi, Karna Roga, Krimi, Kushtha and Gulma are also described. [1,2]

3. Rasa-Panchaka and Ayurvedic Pharmacodynamics

Rasa: Katu, Tikta and Kashaya are described in the reviewed classical sources. Within Ayurvedic interpretation, these

tastes are relevant to Kapha-reducing and selected therapeutic actions.

Guna: Laghu and Ruksha qualities are traditionally considered important in relation to Kapha and metabolic activity.

Virya: Ushna Virya is described and is relevant to the traditional application of Nirgundi in Vata-Kapha predominant

conditions.

Vipaka: The reviewed source notes variation among textual descriptions; therefore, the exact attribution should be

verified against the particular edition selected for a thesis or manuscript.

Dosha Karma: Vata-Kaphahara action is repeatedly associated with the drug in the reviewed literature. The Ayurvedic

profile is a traditional pharmacodynamic framework and should not be treated as a direct molecular equivalent of

modern pharmacology. [1,2]

4. Classical Therapeutic Uses

Classical literature places Nirgundi in a broad therapeutic range. Its use is particularly discussed in Vata-related

disorders and painful conditions, as well as Shotha and selected disorders involving the ear, skin and gastrointestinal

tract. External application of leaves and preparations is of particular traditional interest in localized painful and

inflammatory conditions. Interpretation of any classical indication should take into account the plant part, preparation,

processing, route and context described in the original source. [1,2]

5. Pharmacognostical and Useful Parts

Leaves, roots, fruits and bark of Nirgundi have been used traditionally and have also been examined in experimental

studies. Leaves and roots are among the commonly reported medicinal parts. Depending on the intended use,

traditional preparations may include fresh juice, decoction, paste, powder or other processed forms. Variation in plant

part and preparation can influence the chemical composition and biological response, and therefore results obtained

from one preparation should not automatically be generalized to all Nirgundi formulations. [3,4]

6. Phytochemical Constituents

Phytochemical investigations of *V. negundo* have identified multiple classes of compounds. Reported constituents

include flavonoids and flavonoid glycosides such as vitexin and isovitexin; lignans and negundin-related compounds;

iridoids including negundoside-related constituents; and terpenoid or triterpenoid compounds such as ursolic acid,

oleanolic acid and betulinic acid. Casticin and other flavonoids have also been reported. [3–6] The chemical profile is

influenced by plant part, geographic source, developmental stage, extraction solvent and analytical technique.

Accordingly, a constituent identified in one extract should not be assumed to represent every Nirgundi preparation.

7. Pharmacological Activities

7.1 Anti-inflammatory Activity

Experimental studies have described anti-inflammatory effects of Nirgundi extracts and selected constituents. This line

of evidence is of interest because it provides a possible pharmacological perspective for traditional applications in

Shotha and painful inflammatory states. The available evidence is predominantly preclinical and therefore does not by

itself establish clinical efficacy in humans. [3–6]

7.2 Analgesic Activity

Analgesic responses have been reported in experimental models using different Nirgundi preparations. These

observations are relevant to the traditional use of the drug in painful Vata-dominant conditions. However, standardized

human dose-response data and adequately controlled clinical comparisons remain necessary. [3,5]

7.3 Antioxidant Activity

Extracts prepared from leaves and other parts of *V. negundo* have shown antioxidant activity in laboratory assays.

Flavonoids and phenolic constituents may contribute to free-radical-scavenging activity. Such assay findings provide

mechanistic information but should not be interpreted as direct evidence of clinical antioxidant benefit. [3,6]

7.4 Antimicrobial Activity

Antibacterial and antifungal effects have been reported for selected extracts and isolated compounds. These findings

offer a possible scientific context for some traditional applications involving skin and infectious conditions, but clinical

antimicrobial effectiveness has not been established on the basis of these experimental observations alone. [3,5]

7.5 Hepatoprotective Activity

Preclinical studies have examined hepatoprotective effects of selected Nirgundi preparations and constituents in

experimental models of chemical or oxidative injury. Iridoid and antioxidant-associated compounds have received

attention in this area. Further controlled investigations are required before therapeutic conclusions can be drawn. [4,6]

7.6 Cardioprotective and Other Activities

Recent literature has explored possible cardioprotective actions of *V. negundo* and its bioactive constituents, including

effects related to inflammation and oxidative stress. Other reported experimental areas include antidiabetic, antiallergic,

anticonvulsant and antitumour activities. The evidentiary strength is not uniform across these areas, and many

observations remain at the preclinical stage. [3,6]

8. Therapeutic Applications

Taken together, the reviewed classical and contemporary literature shows a wide therapeutic research profile for

Nirgundi. Ayurvedic applications are especially linked with Vata-Kapha disorders, pain, swelling and selected skin and ear conditions. Contemporary investigations add research interest in anti-inflammatory, analgesic, antioxidant,

antimicrobial, hepatoprotective, cardioprotective and metabolic effects. These modern observations should be regarded

as areas for further investigation unless supported by adequate clinical evidence. [1–6]

9. Safety Profile and Adverse Effects

Experimental toxicological literature has included assessments of Nirgundi preparations, with some studies reporting

absence of major toxicity at the doses tested. Such findings cannot be generalized to every extract or clinical situation.

Safety may differ according to plant part, extraction procedure, dose, route and duration of exposure. Particular areas

requiring further evaluation include preparation standardization, reproductive safety, herb-drug interactions,

pharmacokinetics and long-term human safety. [6]

10. Future Perspectives

Future Dravyaguna research on Nirgundi should prioritize authentication of botanical material, pharmacognostical and phytochemical standardization, validated biomarkers, pharmacokinetic studies, mechanism-oriented experiments,

dose-response assessment, systematic toxicity evaluation and well-designed clinical trials. Bringing classical

Rasa-Panchaka concepts into dialogue with modern analytical and pharmacological methods may provide a useful

translational research framework without conflating traditional descriptions with molecular mechanisms. [1–6]

DISCUSSION

Nirgundi has a distinctive place in Ayurvedic Dravyaguna because its classical description combines a defined

Rasa-Panchaka with a broad therapeutic spectrum. The reviewed sources describe Katu-Tikta-Kashaya Rasa,

Laghu-Ruksha Guna and Ushna Virya with Vata-Kaphahara action. Shothahara and Shulahara activities and several

disease-related applications are also recorded. [1,2] This classical profile provides the basis for interpreting the

traditional selection and use of the drug.

Modern research adds another layer of evidence through botanical, phytochemical and experimental pharmacological

investigation. Flavonoids, lignans, iridoids, terpenoids, triterpenoids and phenolic compounds have been reported, while

laboratory studies have examined anti-inflammatory, analgesic, antioxidant, antimicrobial, hepatoprotective and cardioprotective effects. [3–6] These findings can complement traditional knowledge by generating testable hypotheses

rather than replacing the Ayurvedic framework.

A major limitation of the current evidence is heterogeneity. Investigations differ in the plant part selected, extraction

method, dose, experimental model and analytical procedure. Consequently, results from one preparation cannot

automatically be applied to another. In addition, a substantial proportion of the pharmacological literature remains

preclinical, while rigorous human clinical evidence and pharmacokinetic information are comparatively limited. [3,6]

From a Dravyaguna perspective, Nirgundi therefore offers an opportunity for integrated research. Classical attributes

can guide the selection of research questions, while modern pharmacognosy, phytochemistry, pharmacology and

clinical research can contribute to authentication, standardization and evidence generation. Maintaining a clear

distinction between traditional therapeutic claims and experimentally demonstrated mechanisms is essential for

scientifically appropriate interpretation.

CONCLUSION

Nirgundi (*Vitex negundo* Linn.) represents an important Ayurvedic medicinal plant with a substantial traditional

knowledge base and an expanding contemporary research profile. Its classical Rasa-Panchaka and therapeutic

applications are particularly relevant to Vata-Kapha dominant, painful and inflammatory conditions. Modern studies have

documented diverse phytoconstituents and investigated several biological activities, including anti-inflammatory,

analgesic, antioxidant, antimicrobial, hepatoprotective and cardioprotective effects. At the same time, limitations remain

in relation to standardization, dosage, pharmacokinetics, long-term safety and clinical validation. Much of the modern

evidence is still preclinical, and therefore further methodologically sound investigations are required. A systematic

integration of Ayurvedic Dravyaguna principles with modern research methods may strengthen the evidence base and

future therapeutic development of Nirgundi.

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