

Therapeutic potential of *Sahadevi* (*Cyanthillium cinereum* (L.) H. Rob.) in *Netra Roga Chikitsa*: A classical and contemporary review

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Abstract

Netra Rogas (ocular diseases) in Ayurveda encompass a wide range of conditions, many of which are linked to inflammation, oxidative stress, and microbial infections. *Sahadevi* (*Cyanthillium cinereum* (L.)H. Rob.), a herb from the *Dashapushpa* group, has been traditionally used for its *Chakshushya*, *Shothahara*, and *Krimighna* properties. To comprehensively review the therapeutic potential of *Cyanthillium cinereum* (*Sahadevi*) in the management of *Netra Rogas* based on Ayurvedic classical texts, pharmacognostical features, phytochemical composition, and modern pharmacological and experimental studies. This is a narrative drug review. Data were sourced from classical Ayurvedic texts (*Charaka*, *Sushruta*, *Bhavaprakasha Nighantu*, etc.), indexed scientific journals (IJPSR, JPTCP, etc.), ethnomedicinal reports (e.g., Nicobari tribal practices), and experimental studies. Inclusion criteria focused on ocular therapeutic relevance, phytochemical profiling, antioxidant, anti-inflammatory, and antimicrobial properties. *Sahadevi* is rich in flavonoids, tannins, phenolic compounds, and alkaloids. It demonstrates strong antioxidant activity (IC₅₀ DPPH = 27.23 µg/mL), anti-inflammatory effects (94.16% in BSA assay), and antimicrobial activity against pathogens like *Staphylococcus aureus* and *Pseudomonas aeruginosa*. In selenite-induced cataract models, the methanolic extract of *V. cinerea* significantly delayed cataract progression with improved oxidative biomarkers. Ethnobotanical evidence supports its traditional ocular use. *Sahadevi* holds significant potential in Ayurvedic ophthalmology, particularly for conditions such as *Abhishyanda*, *Netra Shotha*, and early-stage *Timira*. The convergence

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of classical wisdom, phytochemical richness, and validated pharmacological actions highlights the need for formulation development and clinical trials for its integration into mainstream ocular therapeutics.

Key words : *Sahadevi*, Netraroga, Antioxidant

Vision is one of the most vital senses that enables an individual to interact meaningfully with the world. Disorders affecting the eye, collectively referred to as Netra Rogas, are not only prevalent but also significantly impact quality of life. Among these, inflammatory conditions like *Abhishyanda*, *Netra Shotha*, and degenerative diseases such as *timira* (early cataract) are increasingly observed in clinical practice. The conventional treatment options, especially surgical interventions for cataract, although effective, are often limited by accessibility, cost, and postoperative complications, particularly in under-resourced settings.

The ancient science of Ayurveda offers a vast pharmacopoeia of herbs traditionally used in the treatment of *Netra Rogas*. One such herb is *Sahadevi*, botanically identified as *Cyanthillium cinereum* (syn. *Vernonia cinerea*), belonging to the family Asteraceae¹¹. Widely distributed across tropical and subtropical regions, this plant is known by various vernacular names including Poovamkurunnila in Malayalam and Purple Fleabane in English. It is described in Ayurvedic classical texts like the Atharvaveda, Samhitas, and Nighantus, and has been attributed properties such as *Chakshushya* (beneficial for the eyes), *Krimighna*, *Shothahara*, and *Raktaprasadaka*. It is one among the *Dashapushpa*.⁶

Modern pharmacological research

has reinforced the traditional claims about *Sahadevi*. The plant is a rich source of flavonoids, tannins, alkaloids, and phenolic compounds, all of which are known for their antioxidant, anti-inflammatory, and antimicrobial activities.¹ Oxidative stress plays a crucial role in the pathogenesis of several ocular diseases, especially cataract. Experimental studies, including those conducted on selenite-induced cataract models, have shown that the methanolic extract of *V. cinerea* significantly delays the progression of cataract by enhancing antioxidant enzyme levels and reducing lipid peroxidation in the lens.²

Furthermore, ethnobotanical surveys, such as those conducted among the Nicobari tribes of the Andaman & Nicobar Islands, document the traditional use of *Sahadevi swarasa* for alleviating eye pain, highlighting its role in folk ophthalmic practices.³ Such observations encourage a closer review of this plant's potential in *Netra Roga Chikitsa*, particularly in diseases where oxidative damage and inflammation are key pathological events.

Given the convergence of classical wisdom and modern research, this review aims to comprehensively examine *Sahadevi* (*Cyanthillium cinereum*) in the context of its therapeutic application in *Netra Rogas*, covering its classical references, pharmaco-

gnostical features, phytochemical profile, and evidence from pharmacological and experimental studies.

1. *Nature of the study* :

This study is a narrative drug review aimed at analyzing the therapeutic potential of *Sahadevi* (*Cyanthillium cinereum*) in the management of *Netra Rogas* based on classical Ayurvedic texts, pharmacognostical standards, phytochemical studies, and modern pharmacological research. It includes a comparative review of experimental and traditional data, emphasizing the herb's ocular benefits.

2. *Data sources* :

A thorough literature review was performed using the following sources:

- Classical Ayurvedic texts: Charaka Samhita, Sushruta Samhita, Bhavaprakasha Nighantu, Raj Nighantu, Rajamarthanda and Dravyaguna Vijnana.
- Published research articles and journals: Data was extracted from indexed journals including IJPSR, IJCRT, SLJIM, JPTCP, and others.
- Ethnomedicinal sources: Reports from tribal medicine practices, such as those from the Nicobari community, were reviewed for contextual relevance.
- Phytochemical studies: Analysis of solvent extracts (methanol, aqueous, and hexane) for antioxidant, antimicrobial, and anti-inflammatory properties.
- Experimental models: Special emphasis was given to studies involving selenite-induced cataract in rats, as well as in vitro assays evaluating antioxidant and cytotoxic effects

3. *Inclusion criteria* :

- Studies involving *Cyanthillium cinereum* or its synonyms (*Vernonia cinerea*)
- Articles that explored its ocular effects or relevant pharmacological actions (antioxidant, anti-inflammatory, antimicrobial)
- Ayurvedic texts referring to the plant's usage in *Netra Roga* or general *Chakshushya* properties

4. *Exclusion criteria* :

- Studies lacking identification of plant part or extract used
- Reports focusing solely on non-ocular systems unless the pharmacological action (e.g., antioxidant) was directly applicable to ocular health

5. *Data extraction and analysis* :

Relevant data were extracted and categorized under the following headings:

- Pharmacognostical and botanical description
- Classical Ayurvedic references
- Phytochemical constituents and analytical findings
- Experimental study findings (in vivo/in vitro)
- Ethnobotanical evidence
- Therapeutic implications in *Netra Rogas*

The findings were interpreted in the context of Ayurvedic principles and contemporary ocular pharmacology.

This section compiles the classical, pharmacognostical, phytochemical, and experimental findings relevant to *Sahadevi* (*Cyanthillium cinereum*), emphasizing its

therapeutic potential in *Netra Rogas*.

1. Classical Ayurvedic References

Ayurvedic Nomenclature: *Sahadevi* is described in classical texts including the Atharvaveda, Yajurveda, Samhitas, and Nighantus. It is traditionally indicated in conditions like *Krimi*, *Shotha*, *Netra Roga*, and *Jwara*

- *Rasa: Katu, Tiktha*
- *Guna: Laghu, Ruksha*
- *Virya: Ushna*
- *Vipaka: Katu*
- *Doshaghata: Kaphavatahara*
- *Karma: Krimighna, Shothahara, Chakshushya, Raktaprasadaka*.¹⁰ These properties align with the management of inflammatory and infectious eye disorders.

Sahadevi is cited in Rajamarthanda and indicated specifically for Nayanamaya.⁹ *Sahadevi swarasa* mixed with honey is indicated in redness and swelling of eye.^{6,8} In Yajur veda, medicated ghee prepared from *Sahadeva*, and other drugs is described for *Timira Roga chikitsa*. (Yajurveda 21/36)

2. Pharmacognostical and Morphological Features

Botanical Name: *Cyanthillium cinereum* (L.) H. Rob.

Family: Asteraceae

Common Names: Purple Fleabane, Little Ironweed

Morphology: Erect annual branched herb with cylindrical stem, pubescent surface, and violet-colored flowers⁴

3. Phytochemical Constituents¹²

Multiple studies reveal that *Sahadevi* is rich in: Flavonoids (*e.g.*, quercetin-like compounds), Tannins, Phenolic compounds, Saponins, Alkaloids, Terpenoids.

Methanolic extract showed the highest total phenolic (4.45 mg/g) and flavonoid (1.2 mg/g) content among tested solvents

4. Antioxidant and Anti-inflammatory properties¹²

- DPPH Assay: IC₅₀ value of 27.23 µg/mL (methanol extract), indicating strong free radical scavenging activity
- ABTS Assay: IC₅₀ value of 58.98 µg/mL
- Phosphomolybdenum assay: Highest absorbance of 1.211 at 100 µg/mL
- BSA assay: Aqueous extract showed 94.16% anti-inflammatory activity at 50 µL, better than diclofenac

5. Antimicrobial activity⁷

Methanolic and aqueous extracts showed inhibitory zones against *Staphylococcus aureus*, *Pseudomonas aeruginosa*, and *Streptococcus mutans*, organisms commonly associated with ocular infections.

6. Experimental Study: Cataract model²

A key in vivo study on Sprague Dawley rats using selenite-induced cataract model showed:

Oral administration of methanolic extract of *V. cinerea* (5 µg/g) significantly delayed cataract development.

Biochemical markers in the lens improved: ↑

Catalase (CAT), \uparrow Ca^{2+} ATPase activity, \downarrow ROS and TBARS (markers of oxidative stress). No hepatic or renal toxicity was observed

7. Ethnobotanical evidence³

In Nicobar Islands, tribal healers traditionally use *Sahadevi Swarasa* for relieving eye pain, supporting its *Chakshushya* and *Shothahara* properties.

8. *In vitro* Anthelmintic activity⁵

Decoction of *Sahadevi* inhibited *Toxocara canis* and *Haemonchus contortus* larvae by 89.42% and 86.67%, respectively, supporting its *Krimighna karma* which may extend to ocular *krimi* (e.g., parasitic infections of the eye)

The findings from classical Ayurvedic texts, ethnomedicinal practices, and modern research collectively support the therapeutic potential of *Sahadevi* (*Cyanthillium cinereum*) in the management of *Netra Rogas*, particularly those associated with inflammation, oxidative stress, and microbial infections.

1. Relevance to *Netra Roga Chikitsa*

In Ayurveda, ocular diseases like *Abhishyanda*, *Timira* and *Netra Shotha* are primarily managed by herbs possessing *Chakshushya*, *Shothahara*, *Krimighna*, and *Raktaprasadaka* properties. *Sahadevi* is classically documented to exhibit these very effects, supporting its inclusion in ocular therapeutics. Its *Ushna Virya* and *Tikta-Katu Rasa* profile aids in pacifying *Kapha-Vata*, the common doshas involved in *Bahya Netra Rogas*.

2. Antioxidant and Cataract-Protective mechanism

Cataractogenesis is closely linked with oxidative stress, which leads to lens protein denaturation and opacification. The study by Asha & Abraham² clearly demonstrated that methanolic extract of *V. cinerea* delayed cataract formation in selenite-induced rat models, with improvements in key biochemical markers like catalase and Ca^{2+} ATPase, and a reduction in TBARS and ROS levels. This supports the use of *Sahadevi* in early-stage *timira* (immature cataract).

3. Phytochemical and pharmacological correlation

The presence of flavonoids, tannins, and phenolic compounds in *Sahadevi* contributes to its antioxidant, anti-inflammatory, and antimicrobial properties. These actions align with Ayurvedic principles where such *guna-karma* is desired in managing *Netra Rogas*.

The free radical scavenging ability shown in DPPH and ABTS assays provides a modern explanation for its classical *Raktaprasadaka* and *Chakshushya* effects, as oxidative stress is implicated not just in cataract but also in glaucoma, diabetic retinopathy, and other degenerative eye disorders.

4. Antimicrobial efficacy in eye Infections

Studies reveal that *Sahadevi* extract exhibits antimicrobial activity against several pathogens implicated in conjunctivitis and other ocular infections, including *S. aureus*, *P. aeruginosa*, and *S. mutans*. This supports its

use in *Bahya Netra Roga Chikitsa*, potentially as *Aschyotana* (eye drops), *Anjana* (collyrium), or *Parisheka* (eye wash).

5. Ethnobotanical Validation

The use of *Sahadevi swarasa* for relieving eye pain by Nicobari tribes highlights its field-level utility and validates traditional Ayurvedic claims. Such practices reinforce the need to preserve and research indigenous knowledge for mainstream integration.

6. Scope for Clinical and Formulation Research

While preclinical and ethnobotanical evidence is encouraging, there remains a need for:

- Standardized formulation development (eye drops, decoctions, *lepas*)
- Controlled clinical trials in specific *Netra Rogas*
- Safety profile validation in ocular applications (topical and systemic)

Given its diverse pharmacological actions, *Sahadevi* can be explored both as a single drug therapy and as part of polyherbal formulations in Ayurvedic ophthalmology.

Sahadevi (*Cyanthillium cinereum*) emerges as a promising herbal drug in the management of *Netra Rogas*, offering a blend of traditional Ayurvedic wisdom and contemporary pharmacological relevance. Its classical *Chakshushya*, *Shothahara*, and *Krimighna* actions are strongly supported by its phytochemical richness—particularly in flavonoids, tannins, and phenolic compounds—and its proven antioxidant, anti-inflammatory, and

antimicrobial effects.

Experimental evidence, including selenite-induced cataract models, validates its potential in early cataract management, while ethnobotanical practices further confirm its use in ocular discomfort and inflammation. The non-toxic nature of its extracts in preclinical studies supports its safety for further exploration.

This review reinforces the need to:

- Standardize *Sahadevi*-based ocular formulations
- Initiate clinical studies to validate its efficacy in specific *Netra Rogas*
- Explore its integration into existing Ayurvedic ophthalmic protocols

With its multidimensional therapeutic profile, *Sahadevi* holds significant scope as a natural, accessible, and effective remedy for various ocular disorders in Ayurvedic practice.

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