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AYURVEDIC APPROACH TO *ARMA* (PTERYGIUM): A REVIEW ON EYE DROP FORMULATION FROM CLASSICAL *ANJANA*

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ABSTRACT

Pterygium (Arma) is a fibrovascular growth of the conjunctiva that can compromise ocular surface health and vision *Ayurveda* classifies *Arma* into five types—*Prastari, Sukla, Kshataja, Snayu* & *Adhimansaja*—which differ in morphology, progression, and prognosis. Management is further individualized through *Rogi Pariksa*, assessing *Prakriti* (constitution), *Satva* (psychological resilience) & *Netra Bala* (ocular strength). For patients unwilling or unsuitable for surgery, classical *Ayurvedic* ocular formulations provide a non-invasive therapeutic option. *Nayansukha Varti (Chakradutta)* & *Pippalayadi Anjana (Yogaratnakara)*, reformulated as eye drops with *Madhu* (honey), though not mentioned in classical texts, is utilized as a *Yogavahi* and preservative, enhancing ocular bioavailability and shelf life. *Nayansukha Varti*, primarily containing *Pippali* and *Haritaki*, exhibits *Sothahara* (anti-inflammatory), *Rasayana* (rejuvenative), *Chaksusya* (vision-promoting) and *Raktashodhaka* (blood-purifying) actions, making it suitable for early-stage *Sukla* and *Prastari Arma*, especially in patients with *Pitta Prakriti* or low *Netra Bala*. *Pippalayadi Anjana*, with a broader polyherbal composition (*Pippali, Haritaki, Vibhitaki, Amalaki, Laksha, Lodhra, Saindhava, Bhringaraja*), provides enhanced *Lekhana* (scraping), *Ropana* (healing), antioxidant, & tissue-regenerative effects, supporting its use in advanced types like *Adhimansaja, Khataja*, and *Snayu Arma* in patients with robust *Kapha Prakriti* and good *Netra Bala*. This review integrates classical *Ayurvedic* knowledge with modern pharmacological insights, highlighting the individualized, multi-targeted mode of action of these eye drops as safe, non-invasive alternatives in pterygium management.

KEYWORDS: Pterygium, *Arma, Ayurvedic* eye drops, *Nayansukha Varti*, *Pippalayadi Anjana*, Non-surgical management.

INTRODUCTION

Pterygium, referred to as *Arma* in Ayurvedic literature, is a fibrovascular growth of the conjunctiva extending onto the cornea, potentially causing irritation, astigmatism, and visual impairment.[1,2] Its prevalence is higher in tropical and subtropical regions, with ultraviolet exposure, chronic irritation, and oxidative stress recognized as key contributors to its pathogenesis.[3,4] Conventional management primarily involves surgical excision; however, recurrence rates remain significant, and pharmacological interventions are limited by side effects and poor tissue-targeted efficacy.[5,6] For patients unwilling or unsuitable for surgery, non-invasive therapeutic options are particularly valuable.

Ayurveda emphasizes preventive and restorative ocular care, recommending classical formulations such as *Nayansukha Varti (Chakradutta)* & *Pippalayadi Anjana (Yogaratnakara)* for disorders like *Arma*. Ayurveda classifies *Arma* into five types—*Prastari, Sukla, Kshataja, Snayu & Adhimansaja*—which differ in morphology, severity, and prognosis. Therapeutic choice is further guided by *Rogi Pariksa*, including *Prakriti* (constitution), *Satva* (psychological resilience), and *Netra Bala* (ocular strength), to optimize efficacy and tolerability of eye drops.

These formulations contain herbs such as *Pippali, Haritaki, Vibhitaki, Amalaki, Laksha, Lodhra, Saindhava, & Bhringaraja*.[7–14] Classical properties (*Rasa, Guna, Virya, Vipaka, Dosha karma)* suggest actions such as *Sothahara* (anti-inflammatory), *Rasayana* (rejuvenative), *Chaksusya* (vision-promoting), *Raktashodhaka* (blood-purifying) & *Lekhana* (scraping).[7–9] Modern pharmacological studies reveal anti-inflammatory, antioxidant, tissue-regenerative, and immunomodulatory effects, providing a mechanistic rationale for limiting fibrovascular proliferation, oxidative stress, and local irritation associated with pterygium.[10–14]

Incorporation of *Madhu* (honey) as a *Yogavahi* and

preservative enhances ocular bioavailability, stability, and patient tolerability.[15] This review consolidates classical *Ayurvedic* principles and modern pharmacology, highlighting the synergistic mode of action of *Nayansukha Varti* & *Pippalayadi Anjana* eye drops as non-invasive, multi-targeted therapeutic options for managing different types of pterygium in patients seeking alternatives to surgery.

MATERIALS AND METHODS

This review evaluates the mode of action of *Nayansukha Varti* and *Pippalayadi Anjana* eye drops in the management of *Arma* (Pterygium).

LITERATURE SOURCES

➢ *Ayurvedic* Literature Review

A comprehensive review of classical *Ayurvedic* texts was performed to extract formulation details, ingredient properties, and therapeutic indications:

- *Chakradutta (Netraroga Chikitsa)*[7]
- *Yogaratnakara (Netra Roga Adhyaya)*[8]
- *Bhavaprakasha (Netra Roga Adhyaya)*[9]

Relevant *Nighantus* were consulted to identify synonyms, *Rasayana* properties, and additional characteristics of constituent herbs.[7–9] Details such as *Rasa, Guna, Virya, Vipaka, Dosha karma*, and classical therapeutic actions (*Karma*) were systematically extracted.

➢ Modern Literature Review

Electronic databases—including PubMed, Scopus, Google Scholar, and AYUSH Research Portal—were searched for pharmacological studies on the individual herbs and excipients used in the formulations. Keywords included: *"Pippali," "Haritaki," "Vibhitaki," "Amalaki," "Laksha," "Lodhra," "Saindhava," "Bhringaraja," "Madhu,"* "Pterygium," "Ocular fibrovascular proliferation," "Eye drops," *"Ayurvedic* formulations*."*

The search focused on studies reporting anti-inflammatory, antioxidant, immunomodulatory, tissue-repairing, and ocular-protective effects of these herbs, as well as the bioenhancing and preservative role of *Madhu* (honey) in eye drop formulations.[10–15]

➢ Selection Criteria

Studies were selected based on the following criteria:

- **Inclusion Criteria**
  - Research articles published in peer-reviewed journals or authoritative classical texts.
  - Studies reporting on the pharmacological or clinical effects of the individual herbs used in the formulations.
  - Articles providing mechanistic insights linking *Ayurvedic* properties to modern pharmacology.
- **Exclusion Criteria**
  - Studies lacking peer review or published in non-scientific journals.
  - Articles not available in English or Hindi.
  - Research focusing on formulations not related to the management of pterygium.

➢ Data Extraction and Synthesis

Data were systematically extracted and tabulated for each constituent herb regarding:

- Classical properties (*Rasa, Guna, Virya, Vipaka, Dosha karma*).
- Pharmacological activities (anti-inflammatory, antioxidant, immunomodulatory, tissue-repairing).
- Synergistic formulation effects and ocular bioavailability enhancement via *Madhu*.

Findings were integrated to describe the synergistic effects of the complete formulations as non-invasive therapeutic options for managing different types of *Arma* while considering *Rogi Prakriti*, *Satva*, ocular tolerance.

➢ Ethical Considerations

As this study is based solely on literature, ethical approval was not required. All sources were appropriately cited to ensure academic integrity.

RESULTS AND DISCUSSION

1. Classical Perspective

- ***Nayansukha Varti***

Mentioned in *Chakradutta (Netraroga Chikitsa 59/121)*, this formulation is indicated for *Arma*. Base drugs *Pippali* & *Haritaki* are described as *Vata–Kapha samaka, Deepana, Pachana, Chakshusya, Rasayana* supporting reduction of fibrovascular overgrowth.[7,10] In the present modified form, *Madhu* has been added, which serves as a *Yogavahi* (bioenhancer) & preservative.[15]

- ***Pippalayadi Anjana***

Referenced in *Yogaratnakara (Netraroga Chikitsa)*, this polyherbal formulation contains *Pippali, Haritaki, Vibhitaki, Amalaki, Laksha, Lodhra, Saindhava, Bhringaraja*. Collectively, these exhibit *Sothahara* (anti-inflammatory), *Ropana* (healing), *Rasayana* (rejuvenative), *Chakshusya* (eye-strengthening) & *Raktashodhaka* (blood-purifying) properties.[8,12] The inclusion of *Madhu* enhances bioavailability, prolongs shelf life, and improves patient compliance.[15]

2. MODERN PHARMACOLOGICAL INSIGHTS

Table 1: Major Constituents, Pharmacological Actions, and Role of Formulation Components in *Arma* (Pterygium).

Drug	Major Constituents	Pharmacological Actions	Relevance in Pterygium
Pippali	Piperine, Piperlongumine	Anti-inflammatory, antioxidant, immunomodulatory[10,11]	Inhibits fibroblast proliferation, reduces redness
Haritaki	Chebulagic acid, Gallic acid	Antioxidant, wound healing, antimicrobial[11,12]	Prevents oxidative stress on ocular tissue
Vibhitaki	Ellagic acid, Tannins	Antioxidant, anti-fibrotic[12]	Controls fibrovascular growth
Amalaki	Vitamin C, Emblicanin, Gallic acid	Potent Antioxidant, *Rasayana*[12,13]	Protects against UV-induced oxidative stress
Laksha	Laccaic acids, Resins	*Ropana, Rakta-stambhaka*[13]	Restricts vascular proliferation
Lodhra	Symplocosides, Tannins	Anti-inflammatory, astringent[13,14]	Shrinks fibrovascular tissue, reduces congestion
Saindhava	NaCl, trace minerals	Penetration enhancer, *Tridosa-shamaka*[14]	Improves ocular absorption
Bhringaraja	Wedelolactone, Ecliptine	Antioxidant, *Rasayana*[14]	Aids tissue regeneration
Madhu	Flavonoids, Phenolics, Enzymes	Antimicrobial, wound healing, bioenhancer[15]	Acts as Preservative, enhances bioavailability

3. Mechanism of Action in Pterygium

- Anti-inflammatory: *Pippali, Haritaki* & *Lodhra* reduce ocular surface inflammation.[10–14]
- Antioxidant protection: *Triphala (Haritaki, Vibhitaki, Amalaki)* & *Bhringaraja* mitigate oxidative stress, which is a key factor in pterygium progression.[12–14]
- Fibrovascular modulation: Piperine, chebulagic acid, and tannins suppress abnormal fibroblast proliferation and angiogenesis.[10–12]
- *Ropana* (healing) & *Rasayana* (rejuvenation): *Laksha, Amalaki* & *Bhringaraja* enhance tissue repair and maintain ocular health.[13,14]
- Bioavailability enhancement: *Madhu* & *Saindhava* facilitate drug penetration and stability.[14,15]

These mechanisms collectively reduce vascularity, slow down fibrovascular growth, and restore conjunctival tissue integrity in *Arma* (pterygium).

4. INTEGRATIVE PERSPECTIVE

The *Ayurvedic* rationale of *Dosa-samana, Sothahara, Ropana* aligns with modern pharmacological effects such as anti-inflammatory, antioxidant, and anti-fibrotic actions. The modification into eye drops with *Madhu* as preservative and *Yogavahi* ensures patient compliance, safety, and enhanced therapeutic delivery, while retaining classical authenticity.

Thus, *Nayansukha Varti* Eye Drop & *Pippalayadi Anjana* Eye Drop present a holistic, multi-targeted, non-surgical approach for the management of pterygium.

CONCLUSION

This review highlights the *Ayurvedic* rationale behind *Nayansukha Varti* & *Pippalayadi Anjana*, reformulated into eye drops with *Madhu*, for the management of *Arma* (Pterygium). Both exhibit *Lekhana, Shothahara, Rasayana*, and *Chaksushya* effects, supported by alkaloids, tannins, and antioxidants.

- *Nayansukha Varti* Eye Drop**:** Mild yet effective; ideal for *Sukla* (thin, avascular) and *Prastari Arma* (early creeping). Suitable for *Pitta prakriti, Alpa Satva* & low *Netra Bala*.
- *Pippalayadi Anjana* Eye Drop**:** Broader spectrum; effective in *Adhimansaja, Kshataja*, and *Snayu Arma*. Recommended for *Kapha prakriti, Madhyama/Pravara Satva* & high *Netra Bala.*

Rogi Pariksa (Prakriti, Satva, Netra Bala) guides individualized therapy. By integrating disease-specific *(Arma bheda)* and patient-specific considerations, these formulations provide a safe, individualized, non-surgical approach for pterygium. Further pharmacological and clinical research is warranted for broader application.

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- **CONFLICT OF INTEREST**

The author declares no conflict of interest.

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