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Pharmaceutico-Analytical Exploration of Shigruasava for Sustained Therapeutic Reliability

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ABSTRACT:
Background: Shigruasava, an Ayurvedic fermented formulation from Moringaoleifera, is traditionally valued for its anti-inflammatory, digestive, and systemic strengthening effects. Its rich phytochemical profile—including antioxidants, flavonoids, vitamins, and phenolic compounds—suggests potential benefits in enhancing visual clarity and supporting ocular health. Although classical texts describe its role in vision improvement, the fermented dosage form has not been extensively investigated using modern pharmaceutico-analytical approaches, necessitating systematic evaluation to ensure consistency, stability, and therapeutic reliability. **Objectives:**To prepare Shigruasava and conduct comprehensive pharmaceutico-analytical evaluations to establish its physicochemical standards, ensure formulation consistency, and support its sustained therapeutic reliability. **Materials and Methods:** The formulation was prepared following classical SandhanaKalpana procedures, including raw material authentication, vessel fumigation (Dhoopana), decoction preparation, controlled fermentation using natural fermenters, and incorporation of PrakshepaDravyas to enhance stability. Fermentation was monitored via classical Siddhi Lakṣaṇa. The final product underwent organoleptic and physicochemical analyses, including pH, specific gravity, alcohol content, and total solids. **Results:** The prepared Shigruasava exhibited characteristic color, aroma, and taste. Physicochemical parameters—total solids 8.1%, total residue 0.2%, specific gravity 1.02, pH 3.7, and alcohol content 4.47%—were within acceptable limits for Asavaformulations. **Conclusion:**Shigruasava shows promise as an internal ocular tonic, enhancing visual clarity and nourishing eye tissues. Its phytochemical richness supports therapeutic value, warranting further pharmacological and clinical studies.

Keywords: Shigruasava, Moringaoleifera, Ayurvedic fermentation, Ocular health, Phytochemical evaluation, Asava, SandhanaKalpana

I. INTRODUCTION :

According to WHO, about 70% of the Indian population uses conventional and alternative medicines. (1,2)In Ayurveda, Kalpana refers to various dosage forms like Kalka, Vati, Bhasma, Asava/Arishta, Kwatha, and Churna, primarily for internal administration. SandhanaKalpana, a key branch of Ayurvedic pharmaceutics, involves natural fermentation of liquids to enhance potency, stability, and therapeutic efficacy. Classical texts (Charaka Samhita, Sushruta Samhita, AshtangaHridaya) describe this process, and Acharya Sharangadhara notes that Asava–Arishta contain naturally generated alcohol, acting as both medicine and vehicle for absorption.(3) Advantages of SandhanaKalpana include reduction of undesirable sugars, minimized side effects, enhanced bioavailability, better extraction of active compounds, yeast-mediated detoxification of heavy metals and pesticides, decreased plant toxicity, rupture of herbal cell walls, and improved leaching of phytochemicals.(4)SandhanaKalpana is classified into AmlaVargiyaSandhan (acidic) and MadyaVargiyaSandhan (alcoholic) fermentations. MadyaVargiyaSandhan includes Asava and Arishta, which generate ethyl alcohol naturally, contributing to their therapeutic efficacy and preservation.Asava and Arishta have been used for over 3000 years .Asava (fermented infusion) and Arishta (fermented decoction) are superior dosage forms due to palatability, faster action, and higher drug concentration.(5,6)Asava is prepared without boiling using fresh herbal juices (Swarasa, Hima), jaggery, and honey, while Arishta uses decoctions (Kwatha).Fermentation with sugar, Dhataki flowers, and spices enhances extraction of phytoconstituents, bioavailability, stability, and therapeutic potency. These dosage forms optimize active ingredient extraction, improve shelf life and absorption, and provide medicinal and nutritional benefits. Essential components include Drava Dravya (liquid), MadhuraDravya (sweeteners), PrakshepaDravya (spices), and SandhanaDravya (fermenting agents), with naturally occurring alcohol enhancing therapeutic efficacy.(7)Importance of Asavaand Arishta(8–10)These formulations are highly stable with increasing potency over time; alcohol enhances extraction, detoxifies certain phytochemicals, and improves bioavailability. They provide fast therapeutic action, are clear, aromatic, slightly acidic and sweetish, and require suitable vessels. s per Ayurveda Shigru known as synonymMochaka (can use in many diseases)(11)Shigru (Moringaoleifera) is valued in Ayurveda for its anti-inflammatory, analgesic, and Vata–Kapha balancing properties, useful in disorders like Shoola and Shotha.(12)Documented since the Rigveda and in classical texts, it is used therapeutically and as a dietary plant, with preparations such as Kwatha, Swarasa, Kalka, and Beeja Kalka. Nighantushighlight its Krumighna, VidradhiNashak, and Amahara properties, noting that all parts benefit eye health (Raj Nighantu: NilaShigru(13); KaiyadevaNighantu: AushadhiVarga(14); DhanvantariNighantu: KaraviradiVarga(15); BhavaprakashaNighantu: Shweta Maricha seeds(11)). Shigruasava—a fermented preparation from Shigruleaves.Maintaining eye health is vital for visual clarity and overall well-being. Herbal interventions, including leaves, decoctions, and fermented preparations, support ocular function. Among these, Shigruasava, a fermented preparation from Moringaoleifera leaves, strengthens ocular tissues, improves vision, and promotes long-term eye health. While Shigru is beneficial in conditions like Shoola and Shotha, it is also effectively used for eye care.

OBJECTIVES: To prepare Shigruasava and conduct comprehensive pharmaceutico-analytical evaluations to establish its physicochemical standards, ensure formulation consistency, and support its sustained therapeutic reliability.

II. MATERIALS AND METHODS

Materials:

Ingredients	Latin name	Part used	Quantity
Shigru	Moringaoleifera	Patra	5 kg
Dhataki	Woodfordiafruticosa	Pushpa	500g
Jaggery / Gud	-	-	-
PrakshepDravyas			
Twak	CinnamomunZeylanica	Twak	200 gm
Ela	Cardamom	Pods	100gm
Pippali	Piper Longum	Fruit	250 gm

Shigru

Dhataki

Jaggery

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Twak

Ela

Pimpali

Instruments: Vessels, Heating source, Stirring rod, Measuring cylinder, Weighing balance, Cloth (for filtration), SandhanPatra, Thermometer

Methods:

The methodology of the present study involves 4 stages

1. Preparation of ShigruPatraKwatha
2. Preparation of DhatakiPushpaPhanta
3. Preparation of ShigruAsava
4. Addition of PrakshepaDravyas

1. Preparation of ShigruPatraKwatha

- Fresh Shigru (Moringaoleifera) leaves (5 kg) were selected, cleaned, and used for decoction preparation.
- Leaves were thoroughly washed to remove dirt and foreign particles.
- Washed leaves were coarsely crushed (Yavakuta) to facilitate efficient extraction.
- The processed leaves were transferred into a stainless-steel vessel.
- Water was added in 16 times the weight of the leaves (80 litres).
- The mixture was allowed to soak for 1–2 hours to ensure uniform wetting of plant material.
- After soaking, the vessel was heated over a controlled flame.
- The contents were boiled with intermittent stirring until the total volume reduced to one-eighth, yielding 10 litres of ShigruPatraKwatha.
- The decoction was removed from heat and filtered through a clean muslin cloth to obtain a clear and uniform Kwatha.
- The prepared 10 litres of ShigruPatraKwatha was immediately used as the primary liquid medium for the preparation of ShigruAsava.

2. Preparation of DhatakiPushpaPhanta

- 500 g of DhatakiPushpa (Woodfordiafruticosa flowers) were selected, cleaned, and placed in a stainless-steel vessel.
- 4 litres of freshly boiled hot water were added to prepare the classical Phanta (hot infusion).
- The vessel was immediately covered with a clean cloth and kept undisturbed for 4–6 hours to allow extraction of active constituents and natural fermenting microorganisms.
- After the infusion period, the mixture was filtered through a clean muslin cloth.
- A clear 2 litres of DhatakiPushpaPhanta was obtained and used fresh for the preparation of ShigruAsava.

3. Preparation of ShigruAsava

- The previously prepared 10 litres of ShigruPatraKwatha were transferred into a clean SandhanaPatra.
- 6 kg of jaggery (powdered and filtered) was added and stirred thoroughly until completely dissolved.
- 2 litres of freshly prepared DhatakiPushpaPhanta were added to initiate natural fermentation.
- The contents were mixed uniformly, and the mouth of the SandhanaPatra was covered with a clean, tight-fitting cloth to allow anaerobic fermentation while preventing contamination.
- The vessel was kept undisturbed in a warm, shaded area for 30 days.
- Periodic observations were made for classical fermentation signs, such as cessation of froth, subsidence of bubbling, and clarity of the upper layer.
- After confirming complete fermentation, the Asavawas gently decanted to remove the clear supernatant, leaving the settled material behind.

4. Addition of PrakshepaDravyas

- After fermentation, the clear portion of ShigruAsava was carefully decanted and filtered.

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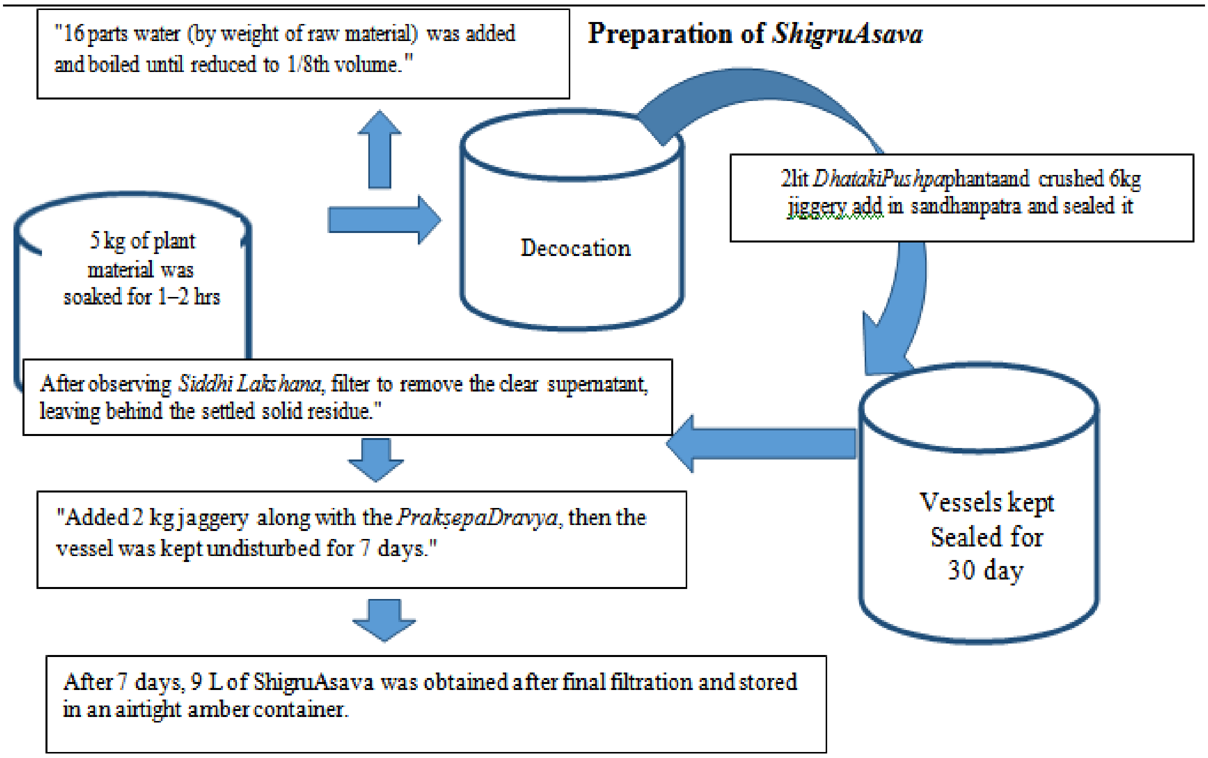
- The filtered Asava was transferred into a clean stainless-steel vessel for further processing.
- An additional 2 kg of jaggery was added to enhance palatability and stabilize the formulation, and stirred until fully dissolved.
- Powdered PrakshepaDravyas were added in the following quantities: Twak200 g, Ela 100 g, Pippali 250 g.
- The mixture was stirred thoroughly to ensure uniform incorporation of aromatic and therapeutic additives.
- The vessel was kept undisturbed for 7 days to allow adequate extraction of volatile and active principles from the PrakshepaDravyas into the fermented liquid.
- Following 7 days of fermentation, the Asava was re-filtered using a clean muslin cloth to produce a clear and homogeneous final product, with a yield of about 9 L.
- The final ShigruAsava was stored in airtight, amber-colored bottles for further evaluation.



Analytical Profiling

ShigruAsava underwent both organoleptic evaluation and physicochemical analysis to assess its overall quality and characteristics

a) Organoleptic properties

According to the Ayurvedic Pharmacopoeia of India, ShigruAsava was evaluated for its color, taste, odor, and texture.

b) Physicochemical properties

The physicochemical evaluation of the prepared ShigruAsava involved measuring total solids, total residue, specific gravity, pH, and alcohol content.

III. RESULT

Organoleptic evaluation

Formulation	Colour	Odour	Taste	Texture
ShigruAsava	Light brown	Characteristic	Bitter	Clear liquid

Physicochemical evaluation

Sr. No.	Parameter	Result	Standard values (as per API)
1.	Total Solids	8.1 %	30%
2.	Total Residue	0.2%	5%
3.	Specific Gravity	1.02	1.01 to 1.20
4.	pH	3.7	3.5 to 4.2
5.	Alcohol Content	4.47%	5 to 10% v/v

IV. DISCUSSION:

ShigruAsava is a novel Ayurvedic fermented formulation that combines the therapeutic potential of Moringaoleifera (Shigru) with classical SandhanaKalpana principles. The self-generated alcohol from microbial fermentation enhances extraction, bioavailability, and tissue penetration of phytoconstituents, while microbial biotransformation increases medicinal potency and naturally preserves the formulation. Shigru leaves, rich in flavonoids, carotenoids, and vitamins, support ocular health through antioxidant, anti-inflammatory, and immunomodulatory effects.The formulation offers efficient extraction of hydrophilic and lipophilic compounds, improved bioavailability of active constituents, natural preservation, synergistic effects from PrakshepaDravyas, and potential benefits in vision support, oxidative damage prevention, and ocular fatigue reduction. The preparation followed classical Ayurvedic methods using ShigruPatraKwatha, jaggery, DhatakiPushpaPhanta, and PrakshepaDravyas. Fermentation progressed normally, indicated by aroma, slight effervescence, and acidic pH. Physicochemical parameters—pH (3.7), specific gravity (1.02), alcohol content (4.47% v/v), total solids (8.1%), and residue (0.2%)—were within acceptable limits, and organoleptic properties were consistent with standards.Shigru (Moringaoleifera) promotes ocular health by pacifying Pitta (Tikta, Kashaya Rasa) to reduce inflammation, improving circulation and clearing channels (Laghu, Ruksha, TikshnaGuna), strengthening eye tissues (UshnaVirya), and nourishing retinal and optic nerve tissues (MadhuraVipaka). Its rich content of vitamin A, beta-carotene, lutein, zeaxanthin, vitamins C and E, flavonoids, and zinc provides antioxidant protection, prevents cataract and macular degeneration, and maintains lens and retinal function, making it a natural Rasayanafor the eyes.Overall, the prepared ShigruAsava is pharmaceutically stable, well-fermented, and demonstrates potential as a natural Ayurvedic formulation for eye care.

V. CONCLUSION:

It can be concluded that Ayurvedic fermented formulations like Asavaoffer notable advantages in extraction efficiency, bioavailability, stability, and therapeutic efficacy. The self-generated alcohol from microbial fermentation acts as a natural solvent and preservative, while biotransformation enhances the potency of the medicinal constituents. Standardization using modern analytical tools is essential to ensure safety, efficacy, and consistency in contemporary manufacturing.Moringaoleifera (Shigru) is a pharmacologically potent and culturally familiar medicinal plant with long-standing use in traditional healthcare. Although widely recognized for supporting eye health, no classical fermented formulation utilizing Shigru leaves has been reported. ShigruAsava thus represents a novel and innovative preparation that addresses this gap.By combining the therapeutic benefits of Shigru leaves with the advantages of SandhanaKalpana, ShigruAsava has the potential to become a valuable addition to Ayurvedic ophthalmic care. Further studies—including phytochemical profiling, standardization, safety evaluation, and clinical trials—are warranted to validate its efficacy and promote its wider clinical and commercial application.

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