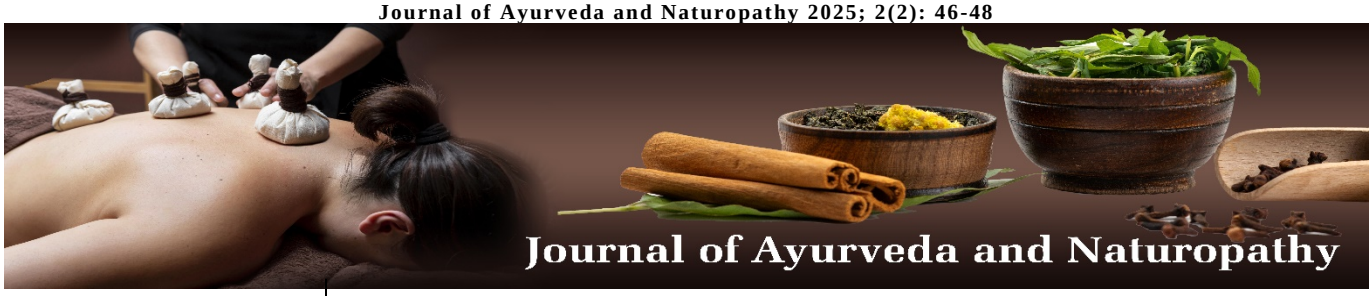

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Therapeutic insights of Avartani (*Helicteres isora*) in classical ayurvedic formulations: A naturopathic perspective

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Abstract
Avartani (*Helicteres isora* L.), commonly called the Indian screw tree, has been acknowledged in Ayurvedic texts as an important medicinal plant used in multiple formulations for gastrointestinal, metabolic, infectious, and inflammatory disorders. Classical sources describe its properties as astringent, light, and cooling, attributing to it actions such as *stambhana* (checking discharges) and *krimighna* (anthelmintic). Modern pharmacological studies confirm the presence of bioactive compounds including tannins, flavonoids, phenolic acids, glycosides, and sterols that confer anti-diabetic, antimicrobial, anti-inflammatory, and antioxidant potential. This review consolidates Ayurvedic references, pharmacognostic data, phytochemistry, and pharmacological validation of *H. isora*, highlighting its integration in classical formulations and its role in naturopathy. From a naturopathic perspective, Avartani represents a plant-based, eco-sustainable, and accessible therapeutic resource that aligns with preventive and holistic health care. The review also emphasizes the need for clinical validation, standardization, and integrative approaches to ensure wider applicability in evidence-based medicine.

Keywords: Avartani, *Helicteres isora*, ayurveda, dravyaguna, naturopathy, phytotherapy, herbal formulations

Introduction

The Ayurvedic system of medicine, one of the oldest surviving medical traditions, emphasizes the use of plant-based remedies in both preventive and curative health care. In this extensive pharmacopoeia, Avartani (*Helicteres isora* L.) is frequently mentioned as a drug of high therapeutic value. Known for its characteristic screw-like twisted fruit, Avartani has been used for centuries in formulations to manage gastrointestinal disturbances, metabolic syndromes, fever, and infections. Ayurvedic treatises describe it as *kashaya rasa pradhana dravya* (predominantly astringent), with *laghu guna* (lightness) and *sheeta veerya* (cooling potency). These attributes justify its traditional indications in conditions such as *atisara* (diarrhea), *pravahika* (dysentery), *prameha* (diabetes-like disorders), *krimi* (intestinal worms), and *jwara* (fever).

Naturopathy, which advocates a return to natural living and emphasizes minimally processed, plant-based remedies, finds resonance in Avartani's wide therapeutic use. Unlike synthetic pharmaceuticals that may produce adverse effects, Avartani offers a safe, eco-friendly, and sustainable approach to health care. It also aligns with the principle of accessible medicine, as the plant is found abundantly in tropical Asia and is easily harvested by rural communities for primary health care.

Modern pharmacological research has added a layer of scientific validation to the empirical use of *H. isora*. Studies have reported significant anti-diabetic, anti-diarrheal, antimicrobial, antioxidant, and anti-inflammatory properties, attributed to its phytoconstituents such as tannins, flavonoids, sterols, phenolics, and glycosides. These findings support its traditional usage while highlighting opportunities for its integration into contemporary medicine. The combination of classical Ayurvedic references, ethnomedicinal use, and modern validation positions Avartani as a candidate for integrative health care in the 21st century.

This review synthesizes information from Ayurvedic texts, pharmacognostic studies, phytochemical analyses, and pharmacological evaluations to provide a comprehensive account of Avartani. It also contextualizes the plant within a naturopathic framework, underscoring its role in preventive health and sustainability.

Botanical and Pharmacognostic Profile

Helicteres isora L., commonly known as *Avartani* in Sanskrit and the Indian screw tree in English, belongs to the family Malvaceae *(*earlier placed under *Sterculiaceae).* The name *Avartani* is derived from the peculiar spirally twisted fruits that resemble a screw or spiral coil, a characteristic that aids its easy identification in the field. The plant is a deciduous shrub or small tree, usually attaining a height of 3-6 meters, distributed abundantly in dry deciduous forests, scrublands, and wastelands across India, Sri Lanka, Bangladesh, Myanmar, and Southeast Asia.

The plant is widely available in states such as Madhya Pradesh, Maharashtra, Rajasthan, and Tamil Nadu, and thrives particularly in areas with dry tropical climates. Its preference for light sandy to loamy soils makes it adaptable to marginal lands, thus increasing its importance as a sustainable medicinal resource.

Pharmacognostically, *Avartani* exhibits several diagnostic features. The bark is grayish-brown, rough, and fibrous. Leaves are simple, alternate, ovate-lanceolate with serrated margins, and covered with stellate hairs. Flowers are reddish-orange, bisexual, and appear in axillary clusters. Fruits are its most remarkable part: long, cylindrical, twisted spirals about 5-10 cm in length, with hard ridges forming screw-like coils. Seeds are numerous, small, black, and reniform.

Microscopical studies of the fruit and bark reveal the presence of thick-walled parenchyma, spiral xylem vessels, lignified sclereids, and calcium oxalate crystals. Powder microscopy shows abundant tannins and mucilage, confirming its identity as an astringent drug. Physicochemical parameters, such as total ash value, acid-insoluble ash, and water-soluble extractives, have been determined in pharmacopoeial studies, aiding in the standardization of crude drug samples.

These pharmacognostic characters not only help in the identification of genuine plant material but also play a crucial role in preventing adulteration and ensuring the therapeutic efficacy of Ayurvedic formulations containing *Avartani.*

Table 1: Botanical and Pharmacognostic Profile of *Helicteres isora (Avartani)*

Parameter	Description
Botanical Name	*Helicteres isora L.*
Family	*Malvaceae (formerly Sterculiaceae)*
Sanskrit Name	Avartani, Mrigashinga
Common Names	Indian screw tree (English), Marorphali (Hindi), Atmorha (Marathi), Idangachakkai (Tamil)
Habit	Deciduous shrub or small tree, 3-6 m tall
Distribution	India, Sri Lanka, Bangladesh, Myanmar, Southeast Asia; thrives in dry deciduous forests and scrublands
Macroscopic Features	Greyish-brown bark; simple serrated leaves; reddish bisexual flowers; distinctive spirally twisted fruits 5-10 cm; small black seeds
Microscopic Features	Presence of lignified sclereids, spiral xylem vessels, calcium oxalate crystals, mucilage cells, abundant tannins
Parts Used	Fruits (chiefly), bark, roots, seeds
Pharmacognostic Markers	Tannins, mucilage, stellate hairs, spiral vessels, screw-like fruit morphology
Physicochemical Parameters	Total ash: ~5-6%; Acid-insoluble ash: ~1%; Water-soluble extractive: ~10-12% (reported in standardization studies)

Classical Ayurvedic References

In *Bhavaprakasha Nighantu*, Avartani is listed under *karpuraadi varga*, noted for its efficacy in *atisara* and *pravahika*. *Dhanvantari Nighantu* highlights its cooling nature and astringent taste, prescribing it in fever and intestinal disorders. *Raj Nighantu* mentions its utility in *krimi* and as a supportive drug in *prameha*.

A few formulations where Avartani is found include:

- **Avartani kwatha**: decoction used in diarrhea and dysentery.
- **Compound churnas**: mixed with *Kutaja* (*Holarrhena antidysenterica*) and *Ativisha* (*Aconitum heterophyllum*) for intestinal disorders.
- **Jwara chikitsa yogas**: Avartani included in fever formulations for its cooling and absorbent properties.

A Sanskrit reference from *Bhavaprakasha* notes:

"Avartani kashaya rasa, sheeta veerya, grahi, atisara pravahika harini."

This highlights its astringent, cooling, and absorptive qualities.

Phytochemistry

Studies have identified multiple bioactive constituents in *H. isora*.

Table 2: Phytochemical Constituents of *Helicteres isora* and Their Reported Pharmacological Activities

Class of Compound	Identified Constituents	Reported Actions
Tannins	Ellagitannins, catechins	Anti-diarrheal, astringent
Flavonoids	Quercetin, kaempferol, rutin	Antioxidant, anti-diabetic
Phenolics	Gallic acid, ferulic acid	Anti-inflammatory, antimicrobial
Glycosides	Steroid glycosides	Antispasmodic, metabolic regulation
Sterols	β-sitosterol	Hypoglycemic, anti-inflammatory
Saponins	Triterpenoid saponins	Antimicrobial, expectorant

The synergistic presence of these compounds explains the multidimensional therapeutic effects attributed to the plant.

Pharmacological Studies

Preclinical and laboratory studies have validated several traditional claims:

- **Anti-diarrheal activity**: Ethanolic extracts reduce intestinal motility and fluid secretion in animal models, supporting its classical use in *atisara*.
- **Anti-diabetic activity**: Studies show reduced blood glucose and improved insulin sensitivity in diabetic rats administered with fruit extracts.
- **Antimicrobial activity**: Extracts demonstrate inhibition against bacterial pathogens like *E. coli*, *Staphylococcus aureus*, and fungal strains such as *Candida albicans*.
- **Antioxidant activity**: High free radical scavenging activity due to phenolic and flavonoid content.
- **Anti-inflammatory activity**: Suppression of carrageenan-induced paw edema and reduction of inflammatory mediators.

Such evidence strengthens the classical Ayurvedic indications and supports its inclusion in integrative approaches.

Therapeutic Applications in Classical Formulations

Avartani is primarily indicated in gastrointestinal disorders. Decoctions and powders are recommended for diarrhea and dysentery, often in combination with *Kutaja*. For *prameha*, formulations incorporate Avartani due to its hypoglycemic properties. Its *krimighna* quality supports use in intestinal worm infestations. In *jwara chikitsa*, it functions as an adjunct herb to reduce systemic heat and inflammation.

From a naturopathic viewpoint, these applications underscore the plant's preventive and curative roles. Its antioxidant and antimicrobial effects contribute to strengthening immunity, while its astringent and cooling properties provide relief in acute gastrointestinal conditions.

Naturopathic Perspective

Naturopathy emphasizes simple, plant-based therapies that harness nature's healing potential without overprocessing or heavy pharmacological intervention. Avartani fits within this philosophy due to its availability, safety, and diverse therapeutic applications. Its role in treating diarrhea, fever, infections, and metabolic disorders makes it suitable for primary care settings, particularly in rural communities.

Furthermore, Avartani aligns with the naturopathic principles of prevention and holistic health. Its antioxidant and immunomodulatory properties enhance resilience, supporting wellness before disease manifests. Eco-sustainability also makes it valuable, as cultivation and use of Avartani pose minimal ecological impact compared to resource-intensive pharmaceuticals.

Discussion

The therapeutic versatility of Avartani demonstrates how classical Ayurvedic wisdom can be validated by modern pharmacological insights. The convergence of textual descriptions, ethnomedicinal practices, and scientific studies highlights the plant's relevance for integrative medicine. While its anti-diarrheal and anti-diabetic effects are well supported, further work is required to standardize formulations, optimize dosage, and evaluate long-term safety. Clinical trials remain scarce, and future research should focus on establishing efficacy through evidence-based protocols.

From a naturopathic perspective, Avartani represents an ideal herbal resource for bridging ancient and modern health systems. It is eco-friendly, widely available, and addresses some of the most common health challenges such as gastrointestinal infections, metabolic disorders, and inflammatory conditions. This makes it not only therapeutically significant but also socio-economically relevant for sustainable health care models.

Conclusion

Avartani (*Helicteres isora*) is a plant with strong Ayurvedic foundations and modern pharmacological support. Its therapeutic uses in gastrointestinal, metabolic, infectious, and inflammatory disorders highlight its multidimensional value. The combination of classical references, pharmacognostic validation, and pharmacological studies demonstrate its suitability for integrative medicine. From a naturopathic perspective, it epitomizes holistic, preventive, and eco-sustainable health care. Future clinical trials and standardization studies will further establish its role in evidence-based Ayurveda and naturopathy.

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