



A TOXICOLOGICAL STUDY ON ANCIENT AND CONTEMPORARY STUDY ON BHALLATAK (*Semecarpus anacardium* Linn.) PLANT

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ABSTRACT

The irritating organic vegetable poison known as bhallataka (*Semecarpus anacardium* Linn.) is included among the Sthavar vanaspatika Vishas in many Ayurvedic text books. The seeds are the most dangerous to humans because of their irritating properties, although all the components are deadly. The Bhallataka nut contains semecarpal and bhilwanol, two poisonous ingredients that also have some therapeutic qualities. It has some local activity similar to that of Sphotjananam (Ushna-Virya) due to its hot potency. Many Ayurvedic formulations use this medication after the appropriate Shodhana (purification), since the prudent use of Asuddha (impure) Bhallataka may result in toxic effects as burning sensation, blister development, ulcer, and other conditions. Several scriptures of Ayurveda detail how to treat the poisonous effects of Bhallataka. Modern toxicology also addresses the postmortem findings, medical and legal aspects, and manifestations of *Semecarpus anacardium* Linn.

KEYWORDS - Bhallataka, *Semecarpus anacardium*, Medico-legal, Toxicology

INTRODUCTION

The branch of Ayurveda known as agad tantra is used to diagnose and treat a variety of poisons, including bites from snakes, insects, spiders, rats, and more, as well as other dangerous substances including plants and minerals. *Semecarpus anacardium* Linn., bhallataka Tree-dhobis nut, often referred to as the marking nut or tree nut, is a member of the Anacardiaceae family. In the Indian system of medicine, it has various medicinal applications. We

are hearing varying views on the properties of the marking nut that are stated in Ayurveda scriptures and text books that is Bhallataka having typical properties, it is used in various diseases, which described in Ayurveda. Preparation of the nut from Bhallataka were used in ancient medicine and still find a place in indigenous medicine.¹

VERNACULAR NAME

English - Marking nut tree., Hindi - Bhilawa, Bhela., Bengali - Bhela, Bhelatuki, Marathi - Bibba, Bhilava, Punjabi - Bhilawa, Bhela, Bhiladar, Arabia - Beladin, Habbul-fahm., Assam - Bhelaguti, Bhala, Bholaguti, Oriya - Bhollataki, Bholai, Balia, Urdu - Baladur, Bhilavan, Tamil - Tatamkottai, Scramkotati, Senkottati, Erimurgi, Telugu - Nallajidi, Nallajidiginga, Bhalatamu., Gujarati – Bhilamu, Kannada - Bhallataka, Godugeru, Karigeri, Malayalam - Chera, Cheru, Alakkucheru.

PLANT EXPLANATION

a deciduous tree of average size that produces a black juice. Petioles, young branches, inflorescences, and leaf undersides are hairy. Obovate, rounded at the apex, cartilaginous at the border, and very coriaceous leaves are present. Flowers are fasciculate and greenish yellow in color. They are grouped in upright, complex, terminal panicles. When ripe, drupes' smooth, glossy, purplish-black, obliquely oval or oblong cups become orange-red. Fruits mature from November to February; flowers bloom throughout the year, primarily in May and June.²

PARYAYA

- Bhallataka
- Tapanā
- Anala
- Taila-bija
- Arushkara, Krimighna
- Vatari, Prthagvija
- Agni
- Dhanurvija
- Sphotaka- bijaka
- Dahana

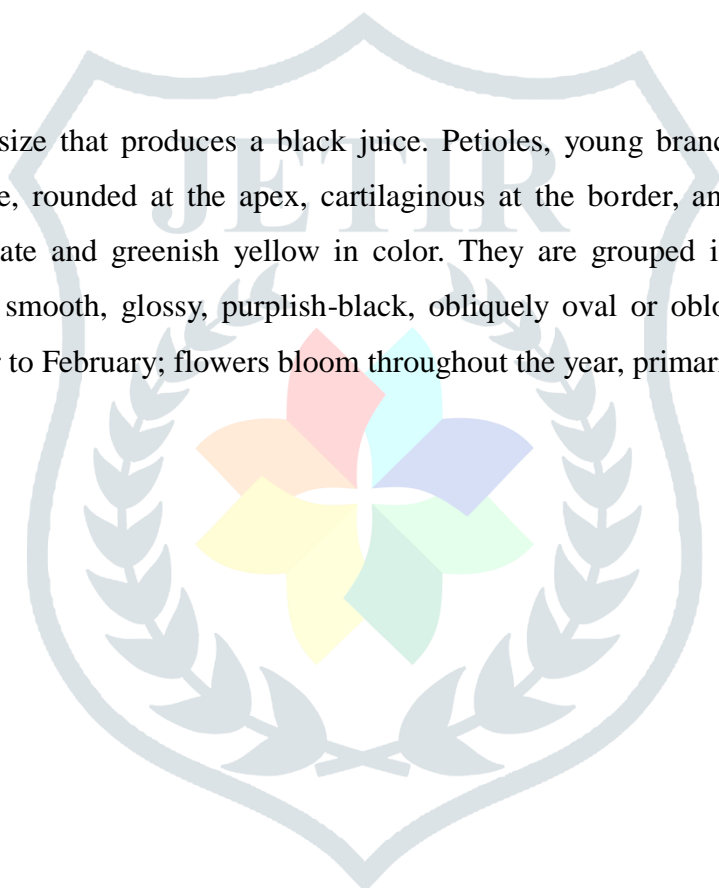


TABLE NO. 1 CHARACTERISTIC OF BHALLATAKA FRUIT IN DIFFERENT NIGHANTU

Characters	Bhavprakash Nighantu	Raj Nighantu	Madanpal Nighantu	Kaiyadeva Nighantu
Guna (Qualities)	Laghu, Snigdha, Teeksna	-	Laghu, Snigdha, Teeksna	Guru, Ruksha
Rasa (Taste)	Madhur, Kashaya	Kashya, Madhur	Madhur, Kashaya	Madhur
Vipaka	Madhur	Madhur	Madhur	Madhur
Veerya (Potency)	Ushna	Koshna	Ushna	Sheeta
Karma (Action)	Agnideepan, Pachan, Chedana, Medhya	-	Deepan, Pachan, Rasayan, Medhya	Sukrala
Dosha- ghnata	Kapha-Vata	Kapha	Kapha-Vata	Pitta
Roga-ghnata	Vrana, Udar, Kustha, Arsha, etc.	Shwas, Anaha, Vibandha, Krimi, etc.	Twakvikar, Urustambha, Switra, Kastaartava	Rakta – Pitta

[Ref - Dr. Deepti Patel, Dr. S. R. Inchulkar, Dr. Yuvraj Kaushik, Dr. N.S. Chauhan. A toxicological review of Bhallataka. J Ayurveda Integr Med Sci 2020;2:209-214.]

CHEMICAL COMPOSITION

Nuts include the bioflavanoids A, B, and tetra hydrobusta, tetra hydromenta, and nalla flavones.

TOXIC PART

FRUIT

Colour - hard, black rind within which brownish, oily juice known as Bhallataka oil is present.

Weight - 1.5 to 3.5 gm

Oil - Colour: Brownish, oily

MEDICINAL DOSE

- Kalka - 3-6 gm
- Taila - 10-20 drop

FATAL DOSE - 5-10gm (pulpy juice) & 140-150 grain

FATAL PERIOD - 12-24 hour

PHARMACOGNOSY

The fruit is kidney-shaped, laterally flattened, drupaceous, dark brown, often 2.5 to 3 cm long, obliquely ovoid, smooth, and shiny green. It also has a fleshy pear-shaped receptacle. When ripe, the nut turns black and the container turns orange. Epicarp, mesocarp, and endocarp are the three types of pericarps. As the fruit ages, the pericarp reveals a single layer of epidermal cells that radially elongate and become lignified. The pericarp has distinctive glands that develop as tiny protuberances in the epicarp and release oil globules as a result of pressure put on them by the mesocarp cells. The mesocarp is a large zone that is between 30 and 40 layers thick. It is mostly made up of parenchymatous cells, lysigenous cavities, and fibrovascular bundles. In each parenchymatous cell, calcium oxalate rosette crystals are dispersed. They get bigger as the fruit ripens and exude an unpleasant, irritating, yellowish oily fluid. The endocarp is made up of two separate layers, the most prominent of which is the prismatic layer. It is significantly elongated, columnar, compactly organized, thick-walled, and lignified, with significantly thickened lateral walls. The cells of the outer layer are comparable to those of the prismatic layer while being shorter and thinner.³

TOXICOLOGICAL DESCRIPTION

Oral administration of *S. anacardium* nuts is possible with milk, ghee, peanut oil, etc. By using such delivery methods, toxic consequences are not seen. On the other hand, anabolic effects come about. To achieve therapeutic results without toxicity, traditional Ayurvedic and Siddha procedures should be strictly adhered to. The range of dose from 300 to 9000mg in a graduated way has been stated in a number of papers. Ghosh et al. conducted toxicology experiments on one Siddha preparation of *S. anacardium* (coded as SKx) and discovered that rats did not experience any deleterious effects or death up to an oral dosage of 2000mg/kg. Even when the extract was given at a high dose of 1000mg/kg, the histological investigations on the liver, lung, kidney, and heart did not demonstrate any significant pathological abnormalities. The animals didn't exhibit any physiological abnormalities or weight loss, and they appeared healthy and active. Hematological results were mostly normal. The overall WBC count was impacted by the extract, however the RBC count and hemoglobin % were unaffected. Vaishnav et al. found that rats and rabbits received the LD50 dosage of 40g/kg. The drug's hazardous side effects include vomiting, diarrhea, and

body-wide edema as well as skin ulcers and vesication. In the summer, it should be taken with caution and in smaller amounts.⁴

THERAPEUTIC EXPLANATION

- 120 rheumatoid arthritis patients received an oral milk decoction of almonds daily for 27 days. In 65% of the patients, very excellent symptom alleviation was seen. Compared to men, women experience toxicity symptoms more frequently.⁵
- Clinical studies of the medication Bhallataka Vati (*semecarpus anacardium*) on patients with Amavata have produced amazing results.⁶
- Clinical studies have indicated that the combination therapy of the three medications, namely Bhallataka (*semecarpus anacardium*), Gourakh (*Dalbergia lanciolaria*), and Guggulu (*Commiphora mukul*), in osteoarthritis, frozen shoulder, and sciatica, has superior results than the individual drugs.⁷
- Clinical studies have demonstrated that the combination therapy using the three medications, namely Guggulu (*Commiphora mukul*), Bhallataka (*semecarpus anacardium*), and Gourakh (*Dalbergia lanciolaria*), has demonstrably improved the condition of patients with rheumatoid arthritis.⁸
- A study was done on Bhallataka (*semecarpus anacardium*) to see how effective it is for sciatica. Bhallataka seemed promising, and the ideal dose was discovered to be 4g daily. This dosage was discovered to be quite beneficial in Gridhrasi.⁹

CLINICAL INTERPRETATION

INGESTION OF ORAL INTAKE

- Excessive salivation,
- Dizziness
- Nausea
- Severe abdominal pain
- Cramps
- Watery purgation,
- Occasionally with blood spots
- Mucus
- Excessive thirst
- Oligourea
- Anurea
- Burning in the upper GIT, Chest, Mouth,
- Blackish blister with acrid serum in GIT Part

APPLICATION ON EXTERNAL SURFACE

- Fever
- Painful Micturation with dark urine
- Painful blackish blister
- Eczematous eruption with intense stinging

TOXICITY OF BHALLATAK

According to Charaka Samhita, contact of Bhallataka fruits or blossoms with the body is one of the causes of Agantuja shotha. The juice of the Bhalataka tree causes severe Daha and Vrana if it comes into touch with the body. It causes a severe burning sensation on the face when it comes into touch with Shotha and Visarpa. Some people exhibit signs of sensitivity to Bhallataka, including black urine, rashes all over the body, red spots, blister diarrhea, fever, bloody urine, burst blisters, and even Unmada. You may also discover oligouria, murky urine, and irritation in the penis and anus.¹⁰

THERAPEUTIC MANAGEMENT OF BHALLATAK TOXICITY

- White albumen of coconu juice from Chinch leaf is given to consume when toxicity manifestations become apparent and Bhallataka medicine is stopped. Ghee, lead lotion, and coconut oil are administered externally.¹¹

*Bibhitaka (*terminalia belerica*) is the particular antidote for Bhallataka's toxicity. The decoction of powder mixture made with fruit rind and bark from *Terminalia belerica* is useful for systemic effects as well as abrupt responses. Medications that reduce Pitta, such as milk, clarified butter, and other medications with cold efficacy, may also be utilized.¹²

MEDICO -LEGAL ASPECT OF BHALLATAK TOXICITY

- Quacks may accidentally poison patients by giving them juice inside.
- Homicide and suicide by poisoning are uncommon.
- The juice may be injected into the vagina as retribution for adultery.
- The juice is applied to skin to induce lesion-stimulating bruises in order to support a fake assault claim.
- The juice could be hurled against the body to harm it.
- The bruised nut is put to the cervicalos during illegal abortion.
- Fraudulent people employ juice to induce ophthalmia.

DISCUSSION

Since the dawn of civilisation, semecarpus anacardium have been used to cure ailments all across the world. The extensive review of the literature revealed Semecarpus anacardium to have a wide range of pharmacological actions. has a prestigious reputation among herbs with a range of biological potentials, and there is a lot of room for new areas of research. The fruit extract has a wide range of activity, including qualities that are antibacterial, anti-cancer, anti-inflammatory, anti-atherogenic, antioxidant, and hair growth promoter. For the prosperity and survival of humans, more work must be put into studying Semecarpus anacardium's traditional usage and validating its activities and mechanisms of action.¹³

Oil made of anacardic acid and cardol is contained in the Semecarpus anacardium nut shell liquid found in the fruit's pericarp. Bhilawanols, semecaduflavanone, and arachid acid are further chemical elements that have been identified. These are the chemical components that cause toxicity and inflammation. The medicine Bhallataka should only be taken after cleansing, according to Ayurveda. Purification is crucial in minimizing side effects during internal administration.¹⁴

CONCLUSION

Semecarpus anacardium is an irritating organic vegetable toxin and is included among the Sthavar Vanaspathic Upavishas in several Ayurvedic texts. Bhallataka (Semecarpus anacardium) is known by its synonyms Shophahetu, Shophakrita, and Vranakrita, which all suggest that it produces ulceration and inflammation. Semecarpus anacardium has a Laghu, Ruksha, and hot potency that is akin to poison. Therefore, the review article's main focus is on how Semecarpus anacardium (Bhallataka) is treated both locally and systemically, as stated in both modern and ayurvedic traditions.

CONFLICT OF INTEREST -NIL

SOURCE OF SUPPORT -NONE

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