



Review Article

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Therapeutic Significance of *Semecarpus Anacardium* Linn.: A Review

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ABSTRACT

Semecarpus anacardium Linn. is well known vegetable irritant poison in Ayurved. The properties of Bhallataka (*Semecarpus anacardium*) is used in various diseases. But without detoxification process of *Semecarpus anacardium* it should not get used, otherwise it may harmful to the human body. The nut of Bhallataka (*Semecarpus anacardium*) contains some biological active compounds such as bhilwanols, phenolic compounds, bhilvanoids, minerals, vitamins and amino acids. With the help of all these contains number of researches have been completed and proved their specific properties like antiarthritic, antimicrobial, antihelmenthic, antioxidant, anticancer etc.

Keywords: Bhallataka, *Semecarpus anacardium*, Therapeutic uses, recent advances.

INTRODUCTION

As per Ayurveda, Bhallataka (*Semecarpus anacardium*) is included in the group of Sthawar Vanaspatic Visha (vegetable poison). Since ancient time it has been using as a household remedy. In ancient scriptures of Ayurveda, medicinal properties of Bhallataka have been described, but in some Nighantu's (minor text books of Ayurveda) we are getting different of opinions of properties of Bhallataka. It is commonly used in all over the India, to mark on cloth for the purpose of identification, that's way it's known as marking nut also. The fruit, sap, stem & seeds of *Semecarpus anacardium* are also used for waterproofing, timber, paint, food & medicine. We are getting different of opinions on the properties of *Semecarpus anacardium* which is stated in Ayurved scriptures and text books. That's way according to typical properties it is used in various diseases, which is described in Ayurveda.

This article is based on a review of Ayurveda scriptures and text books related to the subject. Related materials on Therapeutic Significance, recent advances other relevant topics have been collected. The different of opinions on the properties of Bhallatak (*Semecarpus anacardium* Linn.) have been presented in tabulation form. The main Ayurveda texts Charak Samhita, Sushruta Samhita, Astang Sangraha, Bhavaprakash, Nighantu Raj Nighantu, Shaligram Nighantu, Kaiyadeva Nighantu and available

commentaries on these are used in this study. The information of recent advances on related topic have been collected though internet.

Literature review

Properties of Bhallatak (*Semecarpus anacardium* Linn.) according to various scriptures of Ayurveda has been mentioned in tabulation form in Table 1.^{1,2,3,4}

Medicinal Doses

Oil-10-20 drops; Fruit- 1-2 gm in kshirpaka form; Kalk-3-6gm⁵

Phytochemistry / Chemical constituents

The most significant components of the *S.anacardium* Linn. are bhilwanols, phenolic compounds, biflavonoid, sterols, anacardoside, semecarpetin, nallaflavanone, jeediflavanone, semecarpufllavanone, gallufllavanone, anacarduflavone, bhilawanol-A, bhilawanol-B,amentoflavone, tetrahydroamentoflavone, semicarpol, anacardic acid, tetrahydrobustaflavone, Otrimethyl biflavanone A1, O-trimethyl biflavanone A2, O-tetramethyl biflavanone A1, O-hexamethyl bichalcone A, O-dimethyl biflavanone B, O-heptamethyl bichalcone B1,O-hexamethyl bichalcone B2 and Otetramethyl biflavanone C.⁶

Table 1

Characters	Bhavaprakash Nighantu	Raj Nighantu	Shaligram Nighantu	Kaiyadeva Nighantu
Guna (Qualities)	Laghu (Light to digest), Snigdha (unctuous), Teekshna (piercing)	-	Laghu, Snigdha, Teekshna	Guru (heavy to digest), Ruksha (dry)
Rasa (taste)	Madhura (sweet), Kashaya (astringent)	Kashaya, Madhura	Madhura, Kashaya	Madhura
Vipaka	Madhura (undergoes sweet taste conversion after digestion)	-	Madhura	Madhura
Veerya (potency)	Ushna (hot)	Koshna (look warm)	Ushna	Sheeta (cold)
Karma (action)	Agnideepana (improves digestive secretion) Pachana (helps to digest), Chedana (excision function), Bhedana (incision function), Medhya (beneficial to brain)	-	Agnideepana, Pachana, Chedana, Bhedana, Medhya	Shukrala (creates sperm)
Doshagnata	Kapha, Vata (alleviates kapha & vata dosha)	Kapha	Kapha, Vata	Pitta (alleviates pitta dosha)
Rogaghanata	Vrana (wound), Udar (ascitis), Kushtha (skin disorders), Arsha (Haemorrhoides), Grahani (Inflammatory bowel disease), Gulma (Abdominal mass), Shophna (Inflammation), Anaha (Flatulence), Jwar (Fever), Krimi (Helminthiasis)	Shwasa (Asthma), Anaha, Vibandha, Shula (Pain), Adhmana (gases in abdomen), Krimi (Helminthiasis)	Vrana, Udar, Kushtha (skin disorders), Arsha, Grahani, Gulma (Abdominal mass), Shophna, Anaha, Jwar, Krimi (Helminthiasis)	Raktapitta (bleeding disorders)

Bruhatrayee (Major Ayurveda Samhita)

Charaka, Sushruta, and Vagbhatta are the main treatises of Ayurveda have described diverse Bhallataka preparations.

In Charaka samhita fifty 'mahakashayas' has been described in sustra-sthan. Out of these 'mahakashaya', Bhallataka (*Semecarpus anacardium* Linn) has mentioned in 'Deepaneeeya mahakashaya,'⁷ 'Kushthaghna mahakashaya'⁸ and 'Mutrasangrahaniya mahakashaya,'⁹ In Charaka Samhita, 10 different types of Bhallataka preparations have been described in 'Rasayana adhyaya'¹⁰ which are following -

'Bhallataka Sarpi' (medicated ghee prepared by boiling with Bhallataka). 'Bhallataka Kshir' (medicated milk prepared by boiling with Bhallataka). 'Bhallataka Kshoudra' (preparation of Bhallataka mixed with honey). 'Guda Bhallataka' (preparation of Bhallataka by adding or boiling with jaggery). 'Bhallataka Yush' (soup prepared by boiling other drugs with Bhallataka). 'Bhallataka Taila' (medicated oil prepared by boiling with Bhallataka). 'Bhallataka Palala' (preparation of Bhallataka by adding with palala). 'Bhallataka Saktu' (preparation of Bhallataka by adding with roasted corn flour). 'Bhallataka Lavana' (preparation of Bhallataka by adding salt). 'Bhallataka Tarpana' (preparation of Bhallataka by adding roaster corn flour mixed with large quantity of water)

In Sushrutta Samhita and Ashtanga Samgraha it is indicated that, the use of about 1000 nuts of Bhallataka during the schedule of one therapeutic course of 'Vardhaman prayog' (gradually increasing count).^{11,12}

Therapeutic Uses

As 'Rasayana'- For this purpose, Bhallataka Kshira, Bhallataka Kshudra & Bhallataka Taila are different

Pharmacological preparation of Bhallatak (*Semecarpus anacardium* Linn.) are mentioned in Charaka Samhita.¹³

Arsha-

'Bhallataka Kwatha' has potent efficacy to cure 'Arsha'. It is given to patient early in the morning but before consuming this, entire oral cavity is coated with ghee (butter). Patient should consume cooked rice mixed with ghee (butter) and milk diet during this period.¹⁴

Bhallataka is highly praised to treat the piles specially vata and kapha types (non bleeding piles).¹⁵

'Kushtha- Kwatha' of Bhallataka (*Semecarpus anacardium* Linn), Abhaya (*Terminalia chebula*) and Vidanga (*Embelia ribs*) or only Bhallataka taila cures all types of kushtha.¹⁶

'Jwaraghna'- Bhallataka should give with Guda (jaggery) to prevent Jwara (Fever).¹⁷

'Pleehodara'- Modaka is prepared by equal proportions of Bhallataka (*Semecarpus anacardium* Linn), Abhaya (*Terminalia chebula*), Jeeraka (*Cuminum cyminum*) and guda (jaggery) cures Pleehodara within seven days.¹⁸

'Pleehavidhi' (enlargement of Spleen), Pandu (anaemia), Shwasa (asthma), Kasa (cough) –in all these condition vati (tablet) is prepared from equal quantities of Bhallataka churna (powder), Haritaki churna (powder of Terminalia chebula), Tila churna (powder of sesame seed) and guda cures above diseases.¹⁹

'Visha Anjana Chikitsa'- If vishayukta anjana (collyrium is poisoned) then the flowers of Bhallataka are rubbed in milk which is used as counter – collyrium.²⁰

Bhallataka Formulations

1. 'Bhallatakadi Modaka'- It is used in Pleeha (Splenomegaly)²¹ and Pittaj Arsha (Haemorrhoids).²²
2. 'Bhallatakavaleha Brihada'- It cures Arsha (Haemorrhoids) and all diseases.²³

3. 'Bhallatakadi Kwatha' - It cures Urustambha (Stiffness in muscles of thighs).²⁴
4. 'Bhallataka Ghrita Prathama' - It cures gulma (Cystic growth), Pleehavridhi (Splenomegaly), Pandu (Anemia), Shwasa (Asthma), Grahani (Irritable Bowel syndrome), Kas (Cough).²⁵
5. 'Bhallataka Ghrita dwitiya' - It cures Gulma and Raktagulma (Cystic growth).²⁶
6. 'Bhallatakadya Taila' - It cures Nadivrana (Sinus) and Apachi (Benign growths).²⁷
7. 'Bhallatakadi Lepa' - It cures Indralupta (Alopecia).²⁸
8. 'Amrita Bhallataka' - It acts as nervoin tonic, rejuvinate the body and cures kustha (Skin diseases).²⁹
9. 'Maha Bhallataka Guda' - It cures Shwitra (Vitiligo), Kustha (Skin disease), Visphota (Blisters), Pama (Scabies), Vatarakta (Gout), Udavarta, Pandu (Anaemia), Krumi (Worms), Arsha (Piles), Kas (Cough), Shwas (Asthma), Bhagandar (Fistula), Amavata (Rheumatoid arthritis).³⁰
10. Sanjivani Vati - It cures Ajirna (Indigestion), Gulma (Cystic growth), Visuchika (Cholera), Snake bite and Sannipata.³¹
11. 'Bhallataka Rasayana' Balvardhac (Increases power of body), it cures raktalpatha (anaemia).³²
12. 'Bhallatakarishtha' - It cures Dropsy, Abdominal enlargement, Rectal fistula, Duodenal diseases, Parasites, Leprosy, Diabetes, Emaciation and Kikkasa (stretching of the skin).³³

Recent Advances of *Semecarpus anacardium* Linn.

Amavata / antireumatic activity: Amavata is considered to be a long standing Vatic disease and associated with a chronic gastro-intestinal disorder i. e. Agnimandya. For this purpose a Naimittika Rasayana - Amrita Bhallataka, was tried clinically in a series of patients. After the course of the therapy, a significant reduction in the severity of pain, swelling, tenderness, and stiffness of the joints was recorded and showed a trend of fall in E.S.R, decrease in T. L.C. that suggestive of anti-inflammatory effect of this drug which indicates a clear inhibition of the activity of the disease process. The effect of Amrita Bhallataka was evaluated on reduction in the level of psychological disability with an improvement in the level of immediate memory span.

Amrita Bhallataka improved D-xylose absorption pattern in patients of 'Amavata' after the course of the therapy also supports the Rasayana effect of this drug and exhibits the fundamental mode of action of this drug which appears to be more relevant to the patho-physiology of Amavata (Rheumatoid Disease). The drug may improve the gastro-intestinal functions, may rectify 'Mandagni' (low gastric secretion) leading to better digestion, absorption and metabolism, thus preventing the formation of 'Ama' (Undigested food material) which is the essential cause of production of Amavata (Rheumatoid Disease) disease. Therefore the drug 'Amrita Bhallataka' is a classical 'Naimittika Rasayana' for the treatment of Amavata (Rheumatoid Disease), because it is not only imparts the Rasayana effect but also

controls the process of Amavata by attacking directly the source of Ama (Undigested food material) formation.³⁴

In the second clinical study, 60 patients of amavata were registered. All these 60 patients divided in three groups. In group I (20 patients) were given Bhallatakadi Churna, in group II (20 patients) were given Eranda tail, and in group III (20 patients) were given Bhallatakadi Churna along with Eranda taila.

A significant reduction in the time duration of morning stiffness, shotha, (inflammation) sparshaasahatva, (tenderness) rheumatoid arthritis titer, CRP, ESR were observed; however the grip strength was significantly increased. The improvement was statistically significant in all three groups, but comparatively group III shown more significant relief.³⁵

Anti-inflammatory and anti-arthritis activity: In rats and mice, these activities of *Semecarpus anacardium* Linn milk extract and chloroform extract have been documented. Cyclooxygenase inhibitory flavanoides from the ethyl acetate extract of the stem bark³⁶ and biflavanoides, tetrahydroamentoflavone (THA) from the seeds have been documented. *S. anacardium* extract can inhibit pro-inflammatory cytokines production in mononuclear cells of normal individuals and rheumatoid arthritis patients.³⁷ Further, nut extracts have been demonstrated immunomodulatory activity on the compounds of immune system in adjuvant induced arthritis.³⁸

Anti-oxidant activity: Recent study shows that nut and leaves extract of *S. anacardium* have anti-oxidant potential.³⁹ present study was investigated antioxidant activity of the aqueous extract of nuts of the medicinal plant *Semecarpus anacardium* in AKR mouse liver during the development of lymphoma. Antioxidant action has been monitored by the activities of antioxidant enzymes catalase, superoxide dismutase and glutathione transferase. The effect of *S. anacardium* has been also studied by observing the activity of LDH (lactate dehydrogenase), the aqueous extract had been found to be more effective than doxorubicin, a classical anticarcinogenic drug, with respect to its action on antioxidant enzymes and LDH in the liver of mice with developing lymphomas.⁴⁰

Anthelmethic activity: The anthelmethic activity of different extracts of nuts of *Semecarpus anacardium* were evaluated separately on adult Indian earthworm (*Pheritima posthuma*). It was found that petroleum ether, chloroform extract of *S. anacardium* (PESA and CESA, respectively) showed better anthelmethic activities than ethanol (EESA) and aqueous (AESA) extract of it. The anthelmethic effects of PESA and CESA at 10 mg/ml and EESA at 20 mg/ml concentration are comparable to that of the effects produced by the reference standards, albendazole (10 mg/ml) and piperazine citrate (10 mg/ml). So, the activity reveals concentration dependent nature of all the four different extracts. Potency of these

extracts were found to be inversely proportional to the time taken for paralysis/death of the worms.⁴¹

Anti- cancer Activity: The study was determined the anticancerous efficacy of Ayurvedic preparation made of *Semecarpus anacardium* (SA) nuts. Five groups of rats had been used for the study. 1st group served as water control. For 13 weeks Hepatocellular carcinoma (HCC) had been induced in II, III and IV group's animals using N-nitrosodiethylamine as inducing agent followed by phenobarbitone as promoter. 2nd group of animals were kept untreated as hepatocellular carcinoma control. 3rd group of animals were treated with Ayurvedic milk extract of *Semecarpus anacardium* nuts at dose mentioned in 'Ashtangahridaya', an authentic book of Ayurveda for 49 days and 4th group of animals had been treated with one reference drug doxorubicin as at dose of 1mg/kg twice a week for 7 weeks. 5th group of animals had been kept as drug (SA nut milk extract) control for study the effects of nut milk extract on normal rats.

After completion experiment liver enzymes, HCC marker (alpha-2 macroglobulin) had been increased HCC control group and were decreased in *Semecarpus anacardium* nut milk extract treated group. The Ayurvedic drug has been shown positive correlation with the action of doxorubicin. Either alone or along with chemotherapy, this study demonstrated the efficacy of *Semecarpus anacardium* nut milk extract for the treatment of hepatocellular carcinoma.⁴²

Antidiabetic activity: In diabetes, glucose produced by gluconeogenesis and glycogenolysis which plays an important role in aggravating hyperglycemia and altered mitochondrial function is associated with impaired energy production. This study concentrating on the effect of *Semecarpus anacardium* metabolism of carbohydrate and production of energy in diabetic rats. In this study diabetes had been induced by the administration of Streptozotocin at a dose of 50mg/kg.b.wt. Three days later *Semecarpus anacardium* at a dose of 300mg/kg.b.wt had been administered for 21 days. At the end of this animal experiment enzymes activities of glycolysis, TCA cycle, gluconeogenesis, and glycogen were assayed in the liver and kidney of the experimental animals. In Glycolysis and TCA cycle enzymes levels increased and decreased in gluconeogenesis cycle. The PI3K and AKT also increased in the skeletal muscle. These effects indicates the hypoglycemic and the antioxidative activity of *Semecarpus anacardium*. The results of the study revealed that *Semecarpus anacardium* is able to restore the altered activities of the enzymes involved in carbohydrate metabolism of carbohydrate and production of energy.⁴³

Antispermatic activity: *S. anacardium* fruit extract administration resulted in spermatogenic arrest in albino rats. The sperm motility and density were reduced significantly. The RBC and WBC counts, haemoglobin, haematocrit, blood sugar and urea were found to be within the normal range in the whole blood. The protein, cholesterol and glycogen in the testes and the fructose in

the seminal vesicle were significantly decreased after the treatment. The fruit extract feeding caused marked reduction in the number of primary spermatocytes, secondary spermatocytes and spermatids. The number of mature Leydig cells was also decreased and degenerating cells increased proportionately.⁴⁴

DISCUSSION

The bases of life on earth are plants and for thousands of year's plants and herbs cultures around the world are used to treat illness and maintain health. *Semecarpus anacardium* Linn is one of the best, versatile and most commonly used herbs as a household remedy, medicinal and non-medicinal purposes like marking of cloth, hair dye etc. since ancient times. In Ayurveda, Bhallataka (*Semecarpus anacardium* Linn) is included under 'Upavisha Dravya' (semi poisonous drugs)⁴⁵ and in modern classification of poisons; it is categorized under irritant vegetable organic poison. As per Govt. rules and regulations this poisonous medicinal plant comes under control of Drugs and Cosmetic Act 1940. Though it is toxic in nature, it is most valuable plant in the world of Ayurveda and modern era also. In all three major ancient scriptures of Ayurveda, the medicinal properties and formulations of Bhallataka have been described. But in some nighantu's (minor text books of Ayurveda) we are getting different of opinions on properties of Bhallataka (*Semecarpus anacardium* Linn). The fruits, nut, their oil and seeds are used to treat wide range of diseases like skin diseases, tumors, malignant growths, fever, haemoptysis, intestinal parasites etc. Various advances of *Semecarpus anacardium* Linn is reported on cell lines and animal experimental. In this modern era all these advances have given great value to *Semecarpus anacardium*. Due to its toxic activities, it should not get used before detoxification process. The most common detoxification method involves rubbing of *Semecarpus anacardium* nut with brick powder and then washing the nut with warm water.⁴⁶

In the pharmaceutical industry natural products play an important role in drug development programs. Day by day our traditional medicine knowledge is decreasing and this article gives basic information of bhallataka (*Semecarpus anacardium* Linn.) which would be very helpful in future. Most of the people don't know the importance and proper use of *Semecarpus anacardium* Linn. Specially this plant found only in forest area and quantitatively this plant is decreasing day by day so it is need to aware its importance to society, otherwise it will become rare and we will loss one of the important plants from earth and in future we will get only description of this plant in the dictionary of Indian medicinal plants.

CONCLUSION

In this article *Semecarpus anacardium* Linn. related information has been collected in one bunch. Though it is important medicinal plant, many physicians and pharmaceutical units avoiding use of Bhallataka based preparations due to its toxic nature. But this article will be

helpful to physicians, pharmaceutical companies, and Ayurved students they can use Bhallataka after proper shodhan (detoxification) process. Therapeutic significance of *Semecarpus anacardium* Linn would provide fundamental concepts which eventually would be helpful in developing herbal medicine.

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