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BHALLATAKA AS RASAYANA: A CLASSICAL AYURVEDIC REJUVENATIVE PARADIGM INTERPRETED THROUGH MODERN BIOMEDICAL PERSPECTIVES

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ABSTRACT

Bhallataka (Semecarpus anacardium Linn.), one of the principal *Rasayana Dravya* in *Ayurveda*, has been extensively described in classical texts for its *Ayushkara* (life-promoting), *Medhya* (intellect-enhancing), and *Agnivardhaka* (digestive fire–stimulating) properties. Traditional *Rasayana Chikitsa* aims to delay ageing, enhance immunity, and maintain psychosomatic balance. To explore the concept of *Bhallataka Rasayana* in classical Ayurvedic literature and correlate its rejuvenative claims with contemporary biomedical evidence. A systematic review of Ayurvedic texts including *Charaka Samhita*, *Sushruta Samhita*, and *Ashtanga Hridaya* was undertaken to identify references to *Bhallataka Rasayana*. Parallelly, modern experimental and clinical studies on Semecarpus anacardium were analyzed through electronic databases to elucidate pharmacological correlations. Semecarpus anacardium has a wide spectrum of pharmacological activities, according to the thorough assessment of the literature. It is highly valued among herbs and has a wide range of biological potentials. It also presents many opportunities for brand-new study fields. The fruit extract exhibits a variety of effects, including antibacterial, anti-cancer, anti-inflammatory, anti-atherogenic, anti-oxidant, promoter of hair growth, and many more. These mechanisms

validate the *Rasayana* claims of *Dhatu Poshana* (tissue nourishment), *Vyadhi-kshamatva* (disease resistance), and *Jara Nivarana* (anti-ageing).

KEYWORDS: Antioxidant, Ayurveda, Bhallataka, Immunomodulator, Semecarpus anacardium, Rasayana, Rejuvenation.

INTRODUCTION

Bhallataka (Semecarpus anacardium Linn.), commonly known as the Marking Nut Tree, is one of the most potent and versatile medicinal plants described in Ayurveda. *Bhallataka* consists of mature fruit of Semecarpus anacardium Linn. (Family Anacardiaceae), a medium sized tree found in moist deciduous forests all over the country. The fruits, their oil and the seeds have great medicinal value, and are used to treat the wide range of diseases. Internally, *Bhallataka* is widely used in a vast range of diseases because of its multifarious properties. It is renowned for its profound *Rasayana* (rejuvenative and restorative) properties and occupies a distinct place in the Ayurvedic pharmacopeia.

Across these classical treatises, the drug's *Tikshna* (intensely potent) and *Ushna* (hot potency) attributes are well-acknowledged, along with cautionary references to its toxic principle, Bhilawanols (Urushiol derivatives). Consequently, *Shodhana* is considered indispensable to convert *Bhallataka* from a potentially harmful substance into a safe, nectar-like *Rasayana* capable of promoting vitality, immunity, and longevity.

Word Rasayana is derived from "*Rasasya Ayanam Rasayanam*" which means the way of obtaining a good Rasa is Rasayana.[1] *Acharya Dalhana* has explained that the methods which improve youth and enhance longevity by attaining best quality body tissues are termed as *Rasayana*.[2]

Ayurveda approaches the philosophy of prevention and preservation as the first step to the treatment. To achieve this goal day to day regimen is advised with seasonal changes and diet changes, along with the implication of *Rasayana*.[3]

The fruits, their oil and the seeds have great medicinal value, and are used to treat the wide range of diseases. Internally, *Bhallataka* is widely used in a vast range of diseases because of its multifarious properties.

Recent pharmacological investigations have substantiated these classical insights. Experimental and clinical studies report immunomodulatory, anti-inflammatory, antimicrobial activity that align closely with its traditional indications.

Moreover, *Bhallataka* demonstrates anticancer potential in leukemia, breast, lung, and liver cancers, and exhibits neuroprotective and memory-enhancing activity corresponding to its *Medhya Rasayana* (nootropic) role described by *Vagbhatta*.

Its influence on *Medo Dushti* (lipid-metabolic disorders) also parallels observed hypolipidemic, cardioprotective, and anti-atherogenic effects in modern studies.

Thus, *Bhallataka* serves as a compelling example of how traditional Ayurvedic wisdom harmonizes with contemporary biomedical research, underscoring its dual identity as both a *Rasayana* drug and a multifunctional therapeutic agent—a bridge between ancient rejuvenation therapy and modern integrative medicine.

PROPERTIES AND ACTION

Rasa: Madhura, Katu, Tikta, Kashaya

Guna: Laghu, Snigdha, Tikshna

Virya: Ushna

Vipaka: Madhura

Karma: Dipana, Kaphahara, Pachana, Vatahara, Chedi, Bhedi, Medhya

IMPORTANT FORMULATIONS

Amrita Bhallataka Leha, *Sanjivani Vati*, *Bhallataka Rasayana*, *Bhallataka*di *Modaka.*

RASAYANA (REJUVENATIVE) APPLICATIONS

Rasayana is an Ayurvedic rejuvenation therapy which aims towards the establishment of normal physiology and immune response at the macro to micro-cellular level of each tissue (called *Dhatu*). *Rasayana* therapy strengthens healthy tissues and normal cells and significantly reduces chances of disease spread and progression.[4]

Hence, application of external source of antioxidants could therefore compensate for the increased oxidative stress. Synthetic antioxidants such as butylated hydroxytoluene and butylated hydroxyanisole have recently been reported to be dangerous for human health.[5]

Thus, the search for effective, nontoxic natural compounds with anti oxidative activity has been intensified in recent years.

In *Charak Samhita, Bhallataka* (*Semecarpus anacardium)* is described as *Rasayana* i.e. rejuvenating medicine. Scientific evidences also show the anticancer activity of *Bhallataka* (*Semecarpus anacardium*).[6]

In the *Chikitsa Sthana*, ten distinct formulations are described such as *Bhallataka Ksheera*, *Bhallataka Kshaudra*, *Bhallataka Taila*, *Bhallataka Sarpi*, *Guda Bhallataka*, *Bhallataka Lavana, Bhallataka Tarpan*a and *Bhallataka Yusha-Palala-Saktu*. Its proper and methodical administration results in *Rasayana* effect, promotes *Medha* (intellect), *Ajara* (delays ageing) and enhance *Agni* (digestive fire), alleviates *Kapha*.

Kalpa Prayoga of *Bhallataka Ksheera* up to 30 doses is said to bestow longevity of 100 years (*Shatayu*) without senility.[7]

Rasayana* Perspective in *Ashtanga Hridaya

According to *Ashtanga Hridaya*, *Bhallataka Swarasa* obtained through the *Patana Vidhi* (distillation process) and administered along with *Madhu* (honey) and *Ghrita* (ghee) functions as a potent *Rasayana*, enhancing digestive capacity (*Agni*) and maintaining *Strotas* (body channels) in a clear and unobstructed state. A structured *Kalpa* regimen involving the administration of one thousand purified *Bhallataka* fruits over seven weeks is described as a rejuvenative therapy that alleviates *Prameha, Krimi, Kushtha*, *Arsha*, and *Medo Dosha* (disorders related to fat metabolism).

The *Swarasa* extracted by the *Patala Yantra* method, when used as a *Rasayana* with one-eighth part *Madhu* and two parts *Ghrita*, is referred to as *Amrita Bhallataka Rasayana*, known to improve *Smriti* (memory), *Medha* (intellect), and *Dirghayu* (longevity).

An oil formulation prepared from 300 well-processed *Bhallataka* fruits along with *Shilajatu* and *Tarkshya* is indicated for both internal administration and external application. When used with eleven different *Anupanas*—including *Amlakshukti, Dadhi, Taila, Guda, Payasa, Ghrita, Yavashukti, Tila, Makshika, Mamsa Rasa*, and *Mudga—Bhallataka* exhibits *Param Medhya* (supreme intellect-promoting) and *Ayushkara* (life-promoting) properties.

When administered following *Kuti Praveshika* or *Vatatapika Rasayana* protocols, *Bhallataka* strengthens *Agni*, alleviates *Kaphaja* disorders, and relieves *Vibandha* (constipation). During the *Rasayana* course, substances such as *Kulattha, Dadhi, Shukta, Taila, Abhyanga*, and *Agnisevana* are contraindicated. Through appropriate *Shodhana* (purification), the natural *Teekshna* (sharp) property of *Bhallataka* is converted into *Amrita* (nectar-like form), making it safe and highly effective for rejuvenative therapy.[8]

The *Vidangadi Rasayana*, composed of *Vidanga*, *Bhallataka*, and *Shunthi* (Zingiber officinale) taken with *Madhu* and *Sarpi*, is mentioned to delay *Jara* (ageing) and enhance *Lavanya* (complexion and radiance).[9]

Bhallataka is regarded as an *Agrya Aushadha* (drug of choice) for *Arsha* (piles) — भल्लात्कोऽर्शःसु[10] — and *Shuddha Bhallataka* combined with *Guda* (jaggery) is indicated for the management of *Vishama Jwara* (intermittent fever).[11]

PHARMACOLOGICAL ACTIVITY

Anti-inflammatory Activity: Sushma studied an anti-inflammatory activity of ethanolic extract of fruit nuts of *Semecarpus anacardium* plant in albino rats by carrageenan induced rat paw edema model. Ethanolic extract of *Semecarpus anacar-dium* fruit nut exhibited a dose dependent anti-inflammatory activity.[12]

Ramprasath investigated that *Semecarpus anacardium* significantly decreased the carrageenan-induced paw edema and cotton pellet granuloma.[13]

Satayavati and Bajpai reported the anti-inflammatory activity of Semecarpus anacardium for both immunological and non-immunological origin (Satyavati GV, et al., 1969).[14] Premlatha have been reported Semecarpus anacardium for im-munemodulatory potency, anti-oxidative, membrane stabilizing, tumor marker regulative, glucose level restoring and mineral regulation prop-erties of nut extract in hepatocellular carcinoma and found potent effect against hepatocarcinogen aflatoxin B1.[15]

Salvem observed that ethyl acetate extract of SA led to the isolation of major ac-tive principle, Tetrahydroamentoflavone (THA), a biflavonoid. The in vitro cycloxygenase (COX-1)-catalyzed prostaglandin biosynthesis assay of THA gave an IC50 value of 29.5 µg (COX-1) and 40.5% inhibition at 100 g/mL (COX-2). The in vivo carrageenan-induced paw edema

assay resulted in dose-dependent anti-inflammatory effect and the activity was comparable to the ibuprofen (Selvam C and Jachak SM, 2004).[16]

Bhitre pre-pared the methanolic, ethanolic, chloroform, ethyl acetate and petroleum ether extracts of fruit nuts of Semecarpus anacardium and studied the an-ti-inflammatory activity using the technique of carrageenan-induced paw oedema in albino rats. The extract showed significant anti-inflammatory activity comparable to aspirin (Bhitre MJ, et al., 2008).[17] Crude ethanolic extract of SA nuts was studied by singh for its anti-inflammatory activ-ities in vitro using peripheral blood and synovial fluid mononuclear cells of healthy individuals and Rheumatoid Arthritis (RA) patients. Semecarpus anacardium extract shows inhibition of the spontaneous and LPS-induced production of pro inflammatory cytokines IL-1beta and IL-12p40 but had no effect on TNF-alpha and IL-6 production, both at protein and mRNA level. The crude extract also suppressed LPS induced nuclear transloca-tion of transcription factors (Singh D, et al., 2006).[18]

Kalpaamruthaa (KA), an indigenous-modified Siddha formulation, consists of Semecarpus an-acardium nut milk extract and fresh dried powder of Emblica officinalis fruit along with honey. Kalpaamruthaa was found to be nontoxic up to the dose level of 2000 mg/kg. Further, kalpaamruthaa has been reported for its potent antioxidant analgesic, antipyretic and non-ulcerogenic properties. Mythilypriya studied the anti-inflammatory activity of Semecarpus ana-cardium in Adjuvant-Induced Arthritic rat (AIA) model with reference to mediators of inflammation (lysosomal enzymes) and its effect on pro-teoglycans. The activities of various enzymes and levels of plasma protein bound carbohydrate components of glycoproteins were determined and it was found to be elevated in arthritic rats compared to control animals.[19] Antioxidant activity Shanmugam observed that rats treated with Kalpaamruthaa showed nor-mal lipid peroxide level and antioxidant defences of Semecarpus anacar-dium (Arulkumaran S, et al., 2006).[20]

Veena measured antioxidant status in blood, and vital organs (liver, kidney and breast tissue) of control and experimental animals. In cancer condition, Lipid Peroxidation (LPO) was increased and antioxidant levels were decreased when drug (Semecarpus anacardium and kalpaamrutha) administered, it was found that decreased lipid peroxidation and increased antioxidant activity (Verma N and Vinay-ak M, 2009).[21]

Sahoo investigated the antioxidant activity of ethyl acetate ex-tract of stem bark of Semecarpus anacardium. Ethyl acetate extract shown the stronger antioxidant activity (due to presence of highest total phenolic content of 68.67% measured as pyrocatechol equivalent) compared to the other hexane, chloroform and methanol extracts. The isolation of the ethyl acetate extract of Semecarpus anacardium stem bark yielded a bright yel-low solid crystal, which was identified as butein. This compound exhibited antioxidant activity (IC50 values of 43.28 ± 4.34 µg/ml).[22]

Anti-cancer activity: Mathivadhani studied *Semecarpus anacardium* nut extract for inhibitory effect on human breast cancer cell line (T47D). At the molecular level, it showed decrease in Bcl and increase in Bax, cytochrome c, caspases and PARP cleavage, and ultimately by internucleosomal DNA fragmentation.[23] Sugapriya showed restoration of energy metabolism in leukemic mice treated by *Semecarpus anacardium* nut milk extract. *Semecarpus anacardium* treatment was compared with standard drug imatinib mesylate. *Semecarpus anacardium* nut extract administered to leukemic animals which shown result of clearance of the leukemic cells from the bone marrow and internal organs (Sugapriya D, *et al*., 2007).[24]

Neuroprotective Activity: Farooq evaluated the beneficial effects of *Semecarpus anacardium* nuts ex-tract, on Central Nervous System (CNS) mainly for its locomotor and noo-tropic activities. Vinutha studied that loss of cholinergic cells, particularly in the basal forebrain is accompanied by the loss of neurotransmitter acetyl choline (ACh). The *Semecarpus anacardium* is effective in prolonging the half-life of acetylcholine through inhibition of ACh esterase. *Semecarpus anacardium* is useful in treating cognitive decline, improving memory (Fa-rooq SM, *et al*., 2007).[25]

Antiatherogenic effect: Mary observed that the imbalance between the pro oxidants and antioxi-dants is the main cause of development of atherosclerosis. *Semecarpus an-acardium* shows antioxidant property. It has capacity to scavenge the super oxide and hydroxyl radicals at low concentrations (Mary NK, *et al*., 2003).[26]

Memory enhancing effect: *Semecarpus anacardium* improves memory by increasing cholinergic function (Vinutha B, *et al*., 2007).[27] Methanolic extract of the nuts of *Seme-carpus anacardium* possesses nootropic activity. Shodhana of fruits may be attributed to inhibition of cholinesterase activity and shows decreased nootropic activity.[28]

CONCLUSION

The *Rasayana* application of *Bhallataka*, as outlined in classical Ayurvedic texts, finds substantial resonance with contemporary biomedical observations. The herb's diverse pharmacological properties underscore its potential as a phyto-adaptogen and rejuvenative agent in integrative medicine.

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