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Review Article

A REVIEW ON *ADHAKI* (*Cajanus cajan* Linn.) WITH SPECIAL REFERENCE TO *NIGHANTUS*

Indu Singh[1]*, Jyotirupa Priyadarshini Samal[1], Suresh Kumar Jaiswara[2]

*[1]PG Scholar, [2]Associate Professor, Department of Dravyaguna Vijnana, Institute of Post Graduate Ayurvedic Education & Research at Shyamadas Vaidya Shastra Pith, Kolkata, West Bengal, India.

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ABSTRACT

Adhaki (*Cajanus cajan* Linn), commonly known as pigeon pea or red gram, is an important food crop in India and has also been traditionally valued for its medicinal properties. In Ayurvedic literature, *Adhaki* is described in different Samhitas and Nighantus, where its various properties and therapeutic applications have been documented. Traditionally, different parts of the plant, particularly the leaves and seeds, have been used in conditions such as *Rakta Vikara* (blood disorders), *Grahani* (Irritable bowel syndrome) and *Yakrit Vikara* (liver disorders). The present review was undertaken to compile the information on *Adhaki* mentioned in different *Nighantus* (lexicon) with particular emphasis on its nomenclature, synonyms, varieties, classical classification, *Rasapanchaka*, therapeutic indications, along with its morphological and microscopic characteristics, phytoconstituents and physicochemical standards to bridge the gap between traditional and modern literature. Relevant information was gathered from Ayurvedic Samhitas, Nighantus, pharmacopoeial literature, standard medicinal-plant references and published research studies. Modern experimental studies have reported antioxidant, anti-inflammatory and hepatoprotective activities of different parts of C. cajan. Experimental investigations have demonstrated improvement in biochemical markers of hepatic injury, oxidative stress and histopathological changes following treatment with C. cajan extracts. Its reported phytoconstituents, including flavonoids, isoflavonoids, stilbenes, tannins, saponins and terpenoids, may contribute to these biological effects. However, further well-designed pharmacological, mechanistic and clinical studies are required to establish its therapeutic potential and support its standardized use in evidence-based healthcare.

INTRODUCTION

Adhaki commonly known as *Arhar* or Pigeon pea, its seeds is a staple in every Indian household as *Arhar dal*, but its leaves have also been traditionally consumed in the decoction form for the treatment of *Rakta vikara* in India. Its seeds are already known for its Hepatoprotective activity. Pigeon pea plant protein extracts can up regulate and counteract the inflammatory process, minimize the damage to the liver, delay disease progression and reduce its complication in liver.[1]

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Ethanopharmacological Importance

Adhaki being a forage crop has been utilized as an important remedy for various ailments. The Garo tribal community of Bangladesh utilizes it for the treatment of diabetes and as an energy stimulant. In Chinese folk medicine pigeon pea leaves are used to staunch blood, as an analgesic and to kill the parasites.

The leaves of *Adhaki* (*Cajanus cajan* Linn. of Fabaceae family) are astringent, sweet, diuretic, laxative, cooling, anti-inflammatory, anodyne, and are useful in oral ulcers, odontalgia, gingivitis and inflammations. The seeds are astringent, acrid, sweet, cooling, anthelmintic, constipating, alexeteric, febrifuge and expectorant. They are useful in vitiated conditions of pitta, intestinal worms, oral ulcers, tumours, bronchitis, cough, vomiting, haemorrhoids, fever and cardiac diseases. The *Adhaki* leaves and its seeds when applied as a poultice over the breast, it may induce lactation.[2]

Contemporary experimental studies provide scientific support for some of the traditional medicinal claims of *Adhaki*. Kundu et al. reported that a methanol-aqueous fraction of Cajanus cajan leaves protected rats against alcohol-induced hepatic injury, with reduction of elevated liver marker enzymes and improvement in antioxidant enzyme activities. The study also indicated restoration of UDP-glucuronosyltransferase activity and Nrf2-associated cytoprotective mechanisms.[3] Sarkar et al. demonstrated that a 70% methanolic leaf extract provided antioxidative protection against iron-overload-induced liver damage in mice, reducing hepatic iron accumulation, lipid peroxidation, protein carbonyl and hydroxyproline levels while improving antioxidant status and serum biochemical parameters.[4] Nwaechefu et al. subsequently demonstrated hepatoprotective activity of *C. cajan* leaf extract against CCl_4-induced liver injury, associated with reduction of hepatic enzyme abnormalities, oxidative stress and inflammatory markers, together with improvement in histopathological changes.[3] Protein fractions obtained from C. cajan seeds have also demonstrated protective effects against acetaminophen-induced hepatic damage, with improvement in biochemical and histopathological parameters.[5] These findings provide experimental support for further investigation of *Adhaki* in hepatobiliary disorders.

MATERIALS AND METHODS

An extensive literature review has been carried out related to *Adhaki* (*Cajanus cajan* Linn.) which include Ayurvedic texts, various *Nighantus* as well as modern textbooks along with various journals from PubMed, Google Scholar, Research Gate etc. The information has been collected and presented in a systematic way.



Fig. 1: *Adhaki*- Whole Plant



Fig. 2: *Adhaki*- Leaves with Flowers



Fig. 3: *Adhaki*- Flowering



Fig. 4: *Adhaki*- Shrub

Table 1: Taxonomical classification[6]

Kingdom	Plantae
Phylum	Tracheophyta (Vascular plants)
Class	Magnoliopsida (Dicotyledons)
Order	Fabales
Family	Fabaceae (Pea family)
Subfamily	Faboideae
Genus	Cajanus
Species	Cajan

Table 2: Various regional names of *Adhaki*

Sanskrit	Tuvari
Assamese	Ruharmah
Bengali	Adar, Aaharee, Arhar ,Tur
English	Pigeon Pea, Red Gram
Gujarati	Tuvar, Tuvera, Tur, Tuver
Hindi	Arahad, Arahar
Kannad	Togari, Tovaree, Togari, Kari Uddu, Togaribele
Malayalam	Thuvara, Tuvara
Marathi	Toor, Toori, Tura
Oriya	Harada, Kandulagachha
Punjabi	Arhar
Tamil	Tovarai, Thovary, Adagi Tuvari, Thuvarai,Tuvarai, Thovarai
Telugu	Kandulu, Kadulu
Urdu	Arhar

Table 3: Sanskrit Synonyms of *Adhaki* (*Cajaus cajan* Linn.) in various Nighantus

S.No.	Synonyms	BPN	DN	KN	MPN	NA	RN	SN	SGN
1.	*Tuvari*	+	+	+	+	-	+	+	+
2.	*Kalavrintta*	-	-	+	-	-	-	-	-
3.	*kulatthak*	-	-	+	-	-	-	-	-
4.	*Kulatthaacakraka*	-	-	+	-	-	-	-	-
5.	*Rebhuj*	-	-	-	-	-	-	-	-
6.	*Karabhi*	-	-	-	-	-	-	-	-
7.	*Tamravarna*	-	-	+	-	-	-	-	-
8.	*Calapaha*	-	-	+	-	-	-	-	-
9.	*Sanapuspika*	+	-	-	-	-	-	-	+
10.	*Karavirabuja*	-	+	-	-	-	+	+	+
11.	*Vrittabija*	-	+	-	-	-	+	-	+
12.	*Pitapuspa*	-	+	-	-	-	+	-	-
13.	*Mrittalak*	-	-	-	-	-	-	+	+
14.	*Mrittal*	-	-	-	-	-	-	+	+
15.	*Kakshi*	-	-	-	-	-	-	+	+
16.	*Surashtraj*	-	-	-	-	-	-	+	+
17.	*Varya*	-	+	-	-	-	+	+	+
18.	*Mritshna*	-	-	-	-	-	-	-	+
19.	*Tuvarika*	-	-	-	-	-	-	-	+

Types of *Adhaki* [7]

Adhaki is of three types which are as follow:

a) *Sveta Adhaki*

b) *Rakta Adhaki*

c) *KrishnaAdhaki*

Sveta Adhaki

श्वेततुवरीगुर्वीवातपित्तप्रकोपदा अम्लपिपित्तकराग्राहिण्यपथ्याध्मानकारिणी ॥ (Sh.Ni.)

White variety of *Adhaki* is heavy *Vatapitta prakopa, Amlapitta karak, Malarodh, Pathya* and *Adhamankarak*.

Rakta Adhaki

रक्तातुतुवरीरुच्याबल्यापथ्याज्वरापहा । पित्तसन्तापादिनानारोगनाशकरीमता ॥ (Sh.Ni.)

Rakta variety of *Adhaki* is *Ruchikarak, Pathya, Jvaranasak, Santapa roga hara*.

Krishna Adhaki

कृष्णातुतुवरीबल्याचाग्निदीप्तिकरामता । पित्तदाहप्रशमनीऋषिभिः परिकीत्तिता || (Sh.Ni.)

Krishna Adhaki is *Balyakarak, Agni pradipak, Pitta, Daha samak*.

Table 4: classical Categorization[8]

S.No.	Classics	Categorization
1.	*Caraka samhita*	*Simbidhanya*
2.	*Susruta samhita*	*Mugdadi varga*
3.	*Ashtanga hridaya*	*Ahara varga*
4.	*Bhavaprakash nighantu*	*Dhanya varga*
5.	*Dhanwantari nighantu*	*Suvarnadi varga*
6.	*Kaiydeva nighantu*	*Dhanya varga*
7.	*Priya nighantu*	-
8.	*Madanpala nighantu*	*Dhanya varga*
9.	*Nighatu adarsh*	-
10.	*Raj nighantu*	*Salyadi varga*
11.	*Shaligram nighantu*	-
12.	*Sodhala nighantu*	*Simbidhanya varga*

Morphological descriptions[9]

Adhaki is an erect shrub, about 1.5 to 3 meter in height with many branches bearing silky hair.

Leaves: Leaves are compound, pulvinate, with oblong-lanceolate leaflets, having entire margin and densely silky pubescence beneath the leaves.

Flowers: Flowers are yellow in colour and having inflorescence in terminal panicles or corymbose racemes.

Fruits: Fruits are pods, tipped with the persistent lower half of the style.

Seeds: Seeds are dicotyledonous and vary in colour from yellow and red to brown or black.

Habitat: It is cultivated throughout the India as a major pulse.

Macroscopic Structure

Its roots are stout, branched, cylindrical, tapering having a number of secondary roots and rootlets, surface rough due to transversely running light brown lenticels, cream to light yellow externally, dirty white internally. Fracture is hard and fibrous with characteristic odour and tastes, acrid.

Microscopic Structure

Mature root shows 3-7 layers of cork of rectangular, tangentially elongated, thin-walled cells, interrupted at certain places by lenticels. Secondary cortex consists of outer 3-7 layers of thin-walled, somewhat tangentially elongated parenchymatous cell, followed by a row of oval to elongated stone cells, thick-walled, elliptical, with wide lumen, some adjoining parenchymatous cells containing prismatic crystals of calcium oxalate; in the inner region strands of isolated or groups of 2-12 lignified fibres. Secondary phloem consists of sieve elements, fibres and phloem parenchyma, traversed by phloem rays; phloem fibres lignified, variable in size with pointed tips and wide lumen scattered throughout phloem region in single or in groups. Some stone cells, mostly in groups and possessing yellowish contents, also found scattered in inner phloem, phloem rays cells rectangular to rounded in inner phloem region, rounded to tangentially elongated in outer phloem, cambium consisting of 4-6 rows of thin-walled, narrow, tangentially elongated colourless cells. Xylem occupies bulk of root and composed of vessels, tracheids, xylem parenchyma having pitted walls occur in small groups of 2-3 and also as occasionally isolated units in larger groups of 4-7. Fibers are short with wide lumen and pointed tips.

Major Phytoconstituents[10]

Leaves are rich in flavonoids and stilbenes. They also contain saponins, conspicuous amount of tannins, and moderate amount of reducing sugars, resins and terpenoids. Chemical studies reveal 2-2' methyl cajanone, 2-hydroxy genistein, isoflavones, cajain, cahanones which anti-oxidant properties. Roots are also found to possess genistein. It also contains hexadecanoic acid, β-sitosterol, pinostrobin, longistylin a and longistylin c.

Table 5: *Rasapanchaka* of *Adhaki* from various *Nighantu*

Rasa Panchaka	**BPN[11]**	**DN[12]**	**KN[13]**	**MPN[14]**	**RN[15]**	**SN[16]**	**SGN[17]**
Rasa	*Madhura, Kasaya*	*Kasaya Madhur*	*Kasaya, Madhur*	-	*Kasaya Madhur*	-	*Kasaya*
Guna	*Laghu, Ruksha*	*Laghu*	*Laghu, Sita Ruksha*	*Laghu*	*Guru*	*Laghu Ruksha*	*Laghu, Ruksha*
Virya	*Sita*	*Sita*	*Sita*	*Sita*		-	-
Vipak	*Madhura*	*Katu*	*Katu*	*Katu*	-	-	-
Karma	*Kaphapitta samak*	*Kapha Pitta samak Vatakar*	*Grahi, Vatakarak, Visakar, Kaphapitta nasak* **Leaves** *Tridosa samak, Pathya, Krimi nasak*	*Kaphahar, Visaghna, Raktadosahara*	*Kapha Pittahara*	*Meda Kapha nasak*	*Vata karak*

BPN- Bhavaprakash Nighantu, DN- Dhanavantari Nighantu, KN- Kaiyyadeva Nighantu, MPN- Madanpala Nighantu, RN- Rajanighantu, SN- Shankar Nighantu, SGN- Shaligram Nighantu.

Table 6: Therapeutic Indication of *Adhaki* from various Nighantus

Diseases	**BPN**	**DN**	**KN**	**MPN**	**NA**	**RN**	**SN**	**SGN**	**PN**
Raktapitta	-	-	-	-	-	-	+	+	-
Meda-kapha nasak	-	+	-	-	-	-	+	+	-
Mukha vrana	-	-	-	-	-	-	-	+	-
Gulma	-	-	-	-	-	-	-	+	-
Jvara	-	-	-	-	-	+	-	+	-
Aruchi	-	-	-	-	-	+	-	+	-
Kasa	-	-	-	-	-	-	-	+	-
Hrid roga	-	-	-	-	-	-	-	+	-
Krimi nasak	-	-	+	-	-	-	-	+	-
Mutra sangrahik	_	+	-	-	-	-	+	+	-
Vishgna	-	-	-	+	-	-	-	-	-
Grahini	+	-	+	-	-	-	-	+	-
Yakrit vikara	+	-	-	-	-	-	-	-	-
Kamala	+	-	-	-	-	-	-	-	-
Rakta vikara	+	-	-	+	-	+	-	-	-
Daha	-	-	-	-	-	+	-	-	-

Table 7: Physio-chemical study of *Adhaki* (as per Ayurvedic Pharmacopoeia of India)

Parameters	**Standard Value**	**Reference**	
Foreign matter	Not more than 2 %	Part I Vol III	Appendix 2.2.2.
Total ash	Not more than 3.5 %	Part I Vol III	Appendix 2.2.3.
Acid-insoluble ash	Not more than 0.7 %	Part I Vol III	Appendix 2.2.4.
Alcohol-soluble extractive	Not less than 2 %	Part I Vol III	Appendix 2.2.6.
Water-soluble extractive	Not less than 4 %	Part I Vol III	Appendix 2.2.7.

RESULTS AND DISCUSSION

Adhaki (*Cajanus cajan* Linn.) has long been recognized in Ayurveda not only as an important dietary legume but also as a valuable medicinal plant. The present review brings together evidences from classical Ayurvedic texts and contemporary scientific literature, demonstrating its diverse therapeutic potential. Although widely cultivated as pigeon pea for nutritional purposes, accumulating research suggests that different parts of the plant possess significant pharmacological activities that support many of its traditional uses.

Classical Ayurvedic literature classifies *Adhaki* under *Shamidhanya Varga* and recommends its use in the management of disorders such as *Rakta Vikara, Yakrit Vikara, Kamala, Grahani, Krimi, Mukhavrana, Daha,* and *Jwara*. Interestingly, these traditional indications correspond closely with findings from modern pharmacological studies, which have reported antioxidant, anti-inflammatory, hepatoprotective, antimicrobial, antidiabetic, and wound-healing properties. This agreement between traditional knowledge and experimental evidence strengthens the medicinal significance of *Adhaki*.

The biological activities of *Adhaki* can largely be attributed to its rich phytochemical composition. Studies have identified several bioactive constituents, including flavonoids, isoflavonoids, stilbenes, tannins, saponins, terpenoids, β-sitosterol, genistein, cajanin, cajanone, pinostrobin, and longistylins. These compounds possess well-established antioxidant and anti-inflammatory properties, which may explain the plant's protective effects against oxidative stress and tissue injury. By scavenging free radicals, reducing lipid peroxidation, and modulating inflammatory pathways, these phytochemicals contribute to the preservation of cellular integrity, particularly in hepatic tissues.

Overall, the available evidence indicates that *Adhaki* is a medicinally important plant with considerable therapeutic potential, particularly in the management of liver disorders and oxidative stress-related diseases. Integrating traditional Ayurvedic knowledge with modern scientific research may facilitate the development of standardized, evidence-based herbal formulations. Further multidisciplinary investigations are warranted to validate its traditional claims and establish its role in contemporary healthcare.

CONCLUSION

Being a rich source of protein and a most important forage crop, *Cajanus cajan* Linn. is the most widely used and cultivated crop in India. It has also been used traditionally in many parts of the World for its innumerable medicinal properties but still its identity as a medicinal plant is not established. To date, several flavonoids, isoflavonoids, tannins and protein fractions have been isolated from its different parts and their medicinal uses have been established, but many bioactive constituents and pure compounds have so far been neglected by phytochemists and pharmacologists. A large amount of work has been done only on extracts and not the isolated fractions which shows scope for further study in this direction. The present review article aims at focusing the attention of research scholars on the unexplored and untouched areas related with *Cajanus cajan* Linn. and may act as an important step towards the establishment of *Cajanus cajan* Linn. Millsp. as an important phytomedicine.

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***Address for correspondence**
Dr. Indu Singh
PG Scholar
Department of Dravyaguna Vijnana, Institute of Post Graduate Ayurvedic Education & Research at Shyamadas Vaidya Shastra Pith, Kolkata.
Email: isingh27794@gmail.com

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