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Amaltas (*Cassia fistula linn.*) - A medicinal and pharmaceutical plant

Review Article

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Abstract

Today, interest in medicinal plants has increased dramatically. The description of these plants in ancient texts is very detailed, but in scattered form. We only discovered a few details in the *Nighantus (*an ancient pharmacopeia about medicinal plants). One should go through all available *Ayurvedic* texts for information on any medicinal plant. *Amaltas (Cassia fistula linn.)* has been popular since ancient times as a frequent remedy of choice for *Ayurvedic* physicians due to its various therapeutic properties. These properties are laxative, antibacterial, antipyretic, anti-inflammatory, smooth muscle stimulating, hepato-protective, analgesic, hypoglycaemic, anticancer, abortifacient, anti-colic, anti-infertility, oestrogens, etc. useful in the treatment of diseases such as skin diseases, heart problems, gout, blood diseases, diabetes mellitus, herpes, feverish conditions, etc. It grows in Indian habitat abundantly, and deciduous woodlands of south India. Its concentrate mostly contains alkaloids, tars, flavonoids, rhein glucoside, fisulic corrosive. It also possesses the properties such as hypo-glycemic, laxative, anti-bacterial, antipyretic, anti-inflammatory, smooth muscle stimulant, hepato-protective, analgesic, anticancer, abortifacient, anti-colic, antifertility, estrogenic, etc. It has vast therapeutic importance, but not enough addressed by Ayurvedic point of view, even though many therapeutic potential references from classical *Ayurvedic* texts are available. Hence, an attempt was made to review its therapeutic potential through this article, which will guide the researchers and scholars for further study. The focus of the current review is on the literature review and the analysis of the medicinal, nutritional utility and pharmacological effects of *Amaltas.*

Key Words: *Cassia fistula linn., Amaltas,* Medicinal and pharmacological values of *Amaltas.*

Introduction

Nowadays interest in medicinal plants has increased considerably. Portrayals of such plants in antiquated texts are in fastidious detail; however, it is in dispersed structure. Despite the fact that in *Nighantus* (antiquated pharmacopeia about restorative plants), we have tracked down restricted subtleties. You should go through all available Ayurvedic texts for information on any medicinal plant. *Amaltas* (*Cassia fistula linn.*) belonging to the family Leguminosae, (1) is a medium-sized tree and its various parts are used in *Ayurvedic* medicines and home remedies for common ailments. It can be found in large quantities in forest tracts throughout the majority of India, rising up to an altitude of 1220 m in the sub-Himalayan tract and outer Himalaya in *Kumaon*, as well as in the upper gangetic plain of Bengal, central India, and deciduous forests of south India. (2) It is called as '*Amaltas'* or *'Aragvadha'*. The other popular names in in Hindi are *amaltas, girimala, sonhali, bandarlauri*. In Punjabi, it is recognized as *kaniar, alash, karangal, ali,* kiar. Its Marathi popular names are bahava*, chimkani, bava* and *boya*. In Kannada it is known as *kakke mara* and *kakke* called as *garmala* in Gujarathi and *sonali, amaltas, sundali* and *bandarlati* in Bengali, *sunaru* in Assam. Also in Malyalama, it is famous as *konna* and *kanikkonna* and *sarakonnai, arakkuvadam, aragvadamu* and *konnai* in Telagu; *khiyar-shanpur, Amaltas* in Urdu and *katha-ul-hind* in Arab; while it is popular as riding pipe, golden shower, drumstick, purging cassia, purging fistula, Indian laburnum, and pudding pipe in English. (3) This shows its popularity in every corner of India. *Ayurvedic* physicians are using it for management of different diseases from centuries. Many *Ayurvedic* medicines contain *Cassia fistula linn.,* such as *aragvadha ghrita*, (4) *siddharthaka snana*, (5) *mahakalyanaka guda*, (6) *panchagavya ghrita*, (7) etc. The facts about this medicinal plant from the classics as well as the earlier study done by other researchers have been organised in this review under subjects including pharmacological effect, therapeutic action, nutritional utility, etc.

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Material and methods

This review paper is based on reading and understanding numerous scientific papers regarding

Amaltas (*Cassia fistula linn.*) that have been published in both National and International research journals, scientific books, classical texts of Ayurveda etc. Based on its therapeutic use and functional importance, published data and scientific information on *Amaltas* have been collected and evaluated from a variety of sources.

Aims and objective

To review the pharmacological effect, therapeutic action and nutritional utility from various scientific papers and classical texts of Ayurveda.

Etymology

Amaltas means drumstick tree. *Aragvadha* meaning in *Sanskrit* is that 'which kills the disease'. (8) *Cassia* is the Greek term *kasia*, which was derived from the Hebrew word for the plant; *fistula* is Latin for tube, pipe, or reed; the traditional name for laburnum is *aragvadha*. (9) Thus, it means a plant with tubular fruits and it has significant therapeutic uses.

Synonyms

Rajanighantu has compiled a list of this plant's 19 synonyms.(10) In addition to helping with verse recitation in *Sanskrit*, synonyms provide information about the identification, description, characteristics, and potential medical applications of a given plant. Some of which are given as:

1. *Amaltas* - drumstick tree
2. *Arogyshimbi* – pod of health
3. *Avaghataka* – clears mala
4. *Arevat* – has cathartic property
5. *Chaturangula* – its units are of 4 digits
6. *Deerghaphala* – has lengthened pods
7. *Karnikara* – petals of florets are similar to *champa*
8. *Kandughna* – mollifies itching
9. *Kritamala* – flourished with flowers
10. *Pragraha* – it is simple to hold.
11. *Rajavriksha* – an attractive tree
12. *Shampaka* – a boon
13. *Suvarnaka* – a golden hue
14. *Svarnat* – golden spray
15. *Vyadhighata* – wards for illnesses

Table 1: Categorization in different classical texts of *Ayurveda*

Classical texts of *Ayurveda*	*Varga*	According to action
Charaka Samhita	*Kushthaghna,* (11) *kandughna,* (12) *phalini -virechana,* (14) *tiktaskandha* (15)	*Virechana* (13) (purgation)
Sushruta Samhita	*Samshamana,* (16) *aragvadhadi,* (17) *shyamadi* (18)	*Adhobhagahara* (19) (purgation)
Ashtanga Sangraha Samhita	*Aragvadhadi,* (20) *shyamadi,* (21) *tiktaskandha* (22)	*Virechana upayogi* (23) (useful for purgation)
Ashtanga Hridaya Samhita	*Aaragvadhadi,* (24) *shyamadi* (25)	*Virechanakara* (26) (purgative)
Bhavaprakasha Samhita	*Haritakyadi varga* (27)	
Rajanighantu	*Prabhadradi varga* (28)	
Dhanvantari nighantu	*Guduchyadi varga* (29)	
Kaiyadeva nighantu	Aushadhi varga (30)	

***Ayurvedic* pharmacological properties**

In contemporary pharmacology, a drug's activity is based on its active ingredient; however, in *Ayurveda,* the drug's mode of action is based on five principles known as '*Rasapanchaka*'. (31) *Amaltas* possesses *madhura rasa* (sweet taste), *sheeta veerya* (cool potency), *madhura* (sweet) *vipaka* and *Guna* (properties) such as *guru* (heavy), *snigdha* (unctuous) and *mridu* (soft). (32) Due to these properties, *Aragvadha* is described as useful in diseases like *amavata* (rheumatoid arthritis), *vatarakta* (gout), *kandu* (purities), *kushtha* (skin diseases), *kamala* (jaundice), *mutrakrichhra* (dysuria), *raktapitta* (blood disorders), *hridroga* (cardiovascular diseases), etc. (33)

Table 2: Action of *Cassia fistula linn.* emphasized in *Ayurveda* classics

Action (34)	**Efficacy**	**Effect on *Dosha***
Shothara (anti-inflammatory)	*Kushthaghna* (35) (useful in skin diseases)	*Pittashamaka* (46) (balances *Pitta Dosha*)
Vedanasthapana (pain killer)	*Hridroga* (36) (cardiovascular diseases)	*Kaphashamaka* (47) (balances *Kapha Dosha*)
Anulomana (laxative)	*Jvaraghna* (37) (anti febrile)	*Anilashamaka* (48) (balances *Vata Dosha*)
Shreshtha Mridu Virechaka (best mild laxative)	*Upadansha* (38) (syphilis)	
Raktashodhaka (blood purifier)	*Aamavata* (39) (rheumatoid arthritis)	
Kapha Nissaraka (removing Kapha)	*Udavarta* (40) (upward or backward or reverse movement of *Vata Dosha*)	
Mutra Janana (producing Mutra)	*Shula* (41) (pain)	
Ama Sanshodhana (eliminates Ama)	*Pramehaghna* (42) (anti diabetic)	
Daha Prashamana (reduces burning sensation)	*Udara* (43) (ascites)	
	Visarpa (44) (herpes)	
	Vatarakta (45) (gout)	

Pharmacological actions

Antimicrobial action

Cassia fistula solvent extracts were evaluated against two gramme positive, two gramme negative, and three fungi, respectively, for their antibacterial and antifungal properties. *Cassia fistula* crude extracts showed moderate to strong effectiveness against the majority of the tested microorganisms. Staphylococcus aureus, Streptococcus pyogenes, Escherichia coli, and Pseudomonas aeruginosa were the tested bacterial strains, whereas Aspergillus niger, Aspergillus clavatus, and Candida albicans were the examined fungus strains. It was discovered that the extracts' antibacterial activity was dose dependant. The *Cassia fistula*'s antibacterial properties were brought about by the presence of different secondary metabolites. As a result, these plants can be used to identify bioactive natural compounds that could be employed as starting points for the creation of novel pharmaceutical research activities. (49) The TLC bioautography and time-kill research against Staphylococcus epidermidis were applied to the ethanol extract. The results demonstrate the broad-spectrum efficacy of the leaf extracts and point to potential applications for treating infectious illnesses. (50) *Cassia fistula*'s anticandidal action and its impact on ergosterol biosynthesis. (51) Fruit pulp from Cassia fistula Linn. has been reported to have effective in vitro antibacterial and antifungal properties. (52)

Anti- inflammatory action

The fact that both combinations of the extracts of *Solanum xanthocarpum* and *Cassia fistula* went below the additivity line, as shown by the isobolograms, suggests synergistic interactions between them. The interaction indices for both combinations were found to be less than 1, reiterating the synergistic effects of the combination. (53)

Hepato-protective action

Administering the ethanolic leaf extract orally (ELE) of *Cassia fistula* for 30 days to ethanol + Most of the parameters tested were reversed in the DEN-treated rats, which was comparable to the conventional hepato-protective medication silymarin. The modifications in the hepatotoxicity and oxidative stress indicators were dramatically improved. (54) The results point to an antioxidant and free radical-scavenging property of *C. auriculata* as the likely mechanism of nephron-protection by this plant against cisplatin- and gentamicin-induced kidney injury. (55) It works well for liver toxicity. (56)

Anti-oxidant action

Rats that had been given alloxan to cause diabetes were used to test the antioxidant effects of aqueous *Cassia fistula Linn.* floral extract (ACF). In the heart tissues of ACF-treated diabetic rats, a notable reduction in peroxidation products, including thiobarbituric acid reactive compounds, conjugated dienes, and hydroperoxides, was seen. Upon receiving ACF treatment, diabetic rats' lowered activity of critical antioxidant enzymes such superoxide dismutase, catalase, glutathione peroxidase, glutathione reductase, and glutathione were restored to almost normal range. These findings imply that ACF exhibits promising anti-oxidative action in rats with alloxan-induced diabetes. (57)

Outcome regarding chikungunya

A promising larvicidal, ovicidal, and repellent agent against the chikungunya virus' mosquito vector was *Cassia fistula*'s crude extract. (58)

Outcome on fistula - in - ano

The *Aragvadhadi sutra* plays an effective role in the treatment of fistula - in - ano. (59)

Efficacy in diabetes mellitus

In a study, the extract and fraction of the *cassia fistula* were found to have favourable hypoglycaemic effects. (60)

Anti- toxin action

In India, people with snake bites have historically been treated using *Calotropis gigantea Linn* and *Cassia fistula Linn*. The hemolysis, procoagulant, and oedema-forming properties of hydroalcoholic extract of dried leaves of *Calotropis gigantea* Linn and *Cassia fistula Linn* were examined in relation to cobra (Naja-Naja) venom. The hydroalcoholic extract significantly reduced the activity that causes hemolysis, procoagulation, and oedema. Comparing *Calotropis gigantea Linn* extract to *Cassia fistula Linn*, a dose-dependent neutralisation of Naja-naja (Indian cobra) venom was observed. According to the current investigation, the hydroalcoholic extract of dried leaves of *Calotropis gigantea Linn* and *Cassia fistula Linn* contains substances that counteract the effects of cobra (Naja-Naja) venoms. (61)

Nutritional benefits

An excellent source of iron (Fe) and manganese is found in the edible fruit tissue of Indian laburnum fruit (Mn). Aspartic acid, glutamic acid, and lysine make up a significant portion (15.3, 13.0, and 7.8%) of the pulp's total amino acids. The same amino acids, 16.6% aspartic acid, 19.5% glutamic acid, and 6.6% other, are present in the seeds (lysine). It also has a high energy level, which could help people who need to eat enough calories increase their daily energy needs. (62)

Conclusion

Since ancient times, the *Ayurvedic* medical system has used *Amaltas (Cassia fistula linn.)* as a treatment for a variety of ailments, including *visarpa* (herpes), *kushtha* (skin diseases), *jvara* (fever), *vatarakta* (gout), *raktapitta* (blood disorders), *hridroga* (heart problems), *madhumeha* (diabetes mellitus), etc. Almost all of these properties' utility has recently been revalidated using relevant experimental models, though other properties must still be ruled out. Numerous plant parts that are laxative, antipyretic, hepatoprotective, anticancer, antibacterial,

abortifacient, analgesic, antifertility, hypoglycemic, smooth muscle stimulant, anti-colic, and so on demonstrate the plant's versatility as well as its nutritional benefits.

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