

PHARMACOLOGICAL REVIEW ON *CASSIA FISTULA* LINN (AMALTAS)

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ABSTRACT

Cassia fistula belonging to the family Fabaceae commonly known as Golden Shower, Amaltash. This plant is used in folk medicine to cure burns, constipation, convulsions, diarrhea, dysuria and epilepsy, to cure leprosy, skin diseases and syphilis. *Cassia fistula* have a rich source of tannins, flavonoids and glycosides. Pharmacological activities include antidiabetic, antibacterial, antifertility, anti-inflammatory antioxidant, hepatoprotective, antitumor, antifungal activities. This article aims to provide a comprehensive review on Taxonomy, Botanical description, phytochemical constituents and pharmacological activities.

Keywords: Pharmacological activities, Antidiabetic, Antioxidant, Antimicrobial.

INTRODUCTION

Cassia fistula L., (Fabaceae, Caesalpinioideae), a very common plant known for its medicinal properties is a semi-wild in nature. It is distributed in various regions including Asia, South Africa, China, West Indies and Brazil¹. *Cassia fistula* is a deciduous, medium sized tree up to 24 m in height and 1.8 m in girth, cultivated almost throughout India. The tree is one of the most wide spread in the forest in India, usually occurring in deciduous forests throughout the greater part of India, ascending up to an altitude of 1,220 m in the sub Himalayan tract and outer Himalayas. It is common throughout Gangeetic valley, particularly abundant in Central India and South India². It is planted as an ornamental tree in homesteads and along the roadside. Many biologically important compounds were isolated and identified from different parts of the plant³. The present review of the *Cassia fistula* is based on botanical characters, Taxonomy, Phytochemical constituents and Pharmacological activity.

TAXONOMY

Kingdom : Plantae
Subkingdom : Tracheobionota
Super Division : Spermatophyta
Division : Mangoliophyta
Class : Magnoliopsida
Sub Class : Rosidae
Order : Fabales
Family : Fabaceae
Genus : *Cassia*
Species : *fistula*

VERNACULAR NAMES

English : Golden shower, Indian laburnum
Sanskrit : Saraphala, Survanaka, Argwadha, Rajtaru
Urdu : Amaltas
Bengali : Amaltas, Sondal, Sonali.

BOTANICAL DESCRIPTION

It is a deciduous tree with greenish grey bark, compound leaves, leaflets are each 5-12 cm long pairs. A semi-wild tree known for its beautiful bunches and also used in traditional medicine for several indications. The leaflets are 4-8 pairs, opposite, dark-green and shining above. Leaves 23-40 cm long; main rachis pubescent; stipules minute, linear-oblong, obtuse, pubescent. Leaflets 4-8 pairs, ovate or ovate-oblong, acute, 5-12.5 by 3.8- 9.5cm, bright green and glabrous above, paler and silvery pubescent beneath when young, the midrib densely pubescent on the underside, base cuneate; main nerves numerous, close, conspicuous beneath; petiolules 6-10 mm long, pubescent or glabrous⁴. Flowers are bright yellow in colour, appears in graceful hanging clusters⁵. Flowers in lax racemes 30-50 cm. long; pedicels 3.8- 5.7 cm. long, slender, pubescent and glabrous. Calyx 1 cm long divided to the base, pubescent; segments oblong, obtuse. Corolla 3.8 cm across, yellow; stamens all antheriferous.

A fruit is cylindrical pod and seeds many in black, sweet pulp separated by transverse partitions. The long pods which are green, when unripe, turn black on ripening after flowers shed⁶. The pods are 40-70 cm long and 20-27mm in diameter, straight or slightly curved,

smooth but finely striated transversely, the striations appearing as fine fissures. The rounded distal ends bear a small point marking the position of the style. The dorsal suture appears as a single vascular strand and the ventral suture as two closely applied strands. Internally the pod is divided by thin, buff coloured, transverse dissepiments at intervals of about 0.5cm. Each compartment contains one seed which is flat, oval, reddish brown with a well marked raphe. The seed contains a whitish 8mm. long, slightly less in breadth, and 5mm thick⁴.

endosperm in which the yellowish embryo is embedded⁷. Pulp is dark brown in colour, sticky, sweet and mucilaginous, odour characteristic, and somewhat disagreeable⁸. Drug occurs in flat or curved thick pieces; outer surface smooth to rough with warty patches; greenish grey to red; inner surface rough, reddish with parallel striations; fracture, laminate; odour, sweet and characteristic; taste, astringent⁹. Seeds broadly ovate.



Fig. 1: *Cassia fistula* [A] Leaves [B] Fruits

PHARMACOLOGICAL STUDY

Anti-Fungal Activity

4-hydroxy benzoic acid hydrate obtained from the extracts of the flower of *Cassia fistula* (an ethnomedicinal plant) showed antifungal activity

against rhizophyton mentagrophytes (MIC 0.5 mg/ml) and Epidermophyton floccosum (MIC 0.5 mg/ml)¹⁰.

Wound Healing

Infection is the major problem to treat the wound. Antibiotic resistance by the pathogenic microorganism renders drug ineffective. The alcohol extract of *C. fistula* leaves was analyzed for antibacterial effect against *Staphylococcus aureus* and *Pseudomonas aeruginosa*. *Cassia fistula* treated rats showed, better wound closure, improved tissue regeneration at the wound site, and supporting histopathological parameters pertaining to wound healing, and thus confirming efficacy of *Cassia fistula* in the treatment of the infected wound¹¹.

Antipyretic activity

The *Cassia fistula* pod was found to be devoid of antipyretic activity in experimental models. The pods extracts showed a marked antipyretic effect by causing a reduction in yeast-induced fever. The extract caused a better hypothermal activity against yeast-induced pyrexia in rats. Subcutaneous injection of yeast induces pyrexia by increasing synthesis of prostaglandin and is used to screen¹².

Antioxidant activity

The antioxidant properties of 90% ethanol extracts of leaves, and 90% methanol extracts of stem bark, pulp and flowers from *Cassia fistula*. The antioxidant activity power was in the decreasing order of stem bark, leaves, flowers and pulp and was well correlated with the total polyphenolic content of the extracts. Thus, the stem bark had more antioxidant activity¹³.

Anti ulcer activity

The ethanol leaf extract (ELE) of *Cassia fistula* Linn. (Caesalpinaceae) was evaluated for anti ulcer activity against pylorus ligation - Induced gastric ulcer¹⁴.

Antimicrobial activity

The leaves, stem bark and fruit pulp showed antibacterial activity. The fruit pulp was the most potent in this respect. The activity might be due to the presence of flavonoids. The solvent ether extract of the fruit pulp possess the maximum activity and when compared to chloramphenicol, the activity of 1 gm of this

extract was found to be more than that seen with 100-g of chloramphenicol¹⁵.

Anti-fertility

Cassia fistula reversibly suppresses fertility in male rats. Withdrawal of extract restored all the altered parameters, including organ weights, fertility, circulatory level of hormones and tissue biochemistry, to control levels after 120 days¹⁶. Oral administration of aqueous extract of seeds of *Cassia fistula* to mated female rats from day 1-5 of pregnancy at the doses of 100 and 200 mg/kg body weight resulted in 57.14% and 71.43% prevention of pregnancy, respectively, whereas 100% pregnancy inhibition was noted at 500 mg/kg bw¹⁷.

Anti-leishmaniatic activity

The effectiveness of *Cassia fistula* in the treatment of leishmaniasis, the efficacy of concentrated boiled extract and hydroalcoholic extract of *C. fistula* on leishmaniasis was compared with intralesional injection of Glucantime (meglumine antimonate) in this study. Results indicate that the *C. fistula* fruit gel increases the efficacy of intralesional meglumine antimonate for the treatment of cutaneous leishmaniasis. Combination therapy with intralesional meglumine antimonate and *C. fistula* fruit gel should be considered for the treatment of acute cutaneous leishmaniasis¹⁸.

CONCLUSION

The extensive literature survey revealed that *Cassia fistula* is an important medicinal plant. This plant is used by traditional medical practitioners for the treatment of various diseases. Phytochemical and Pharmacological reviews on plants will give valuable information which will assist the scientists in getting more advanced knowledge about a plant species.

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