ABSTRACT
*Cassia fistula* Linn. commonly known as the Golden Shower, Indian Laburnum. It is native to India, the Amazon and Sri Lanka and diffused in various countries including Mexico, China, Mauritius, South Africa, East Africa, and West Indies. Medicinally it has been various pharmacological activities like antifungal, antioxidant, antimicrobial, anti-inflammatory, anti-tumor, hepatoprotective, hypoglycemic activities. Further, studies reveal the presence of various phytochemical constituents mainly carbohydrates, proteins, fats, secondary metabolites. In traditional medicine, it is used in the treatment of hematemesis, pruritis, intestinal disorders, leucoderma, diabetes, & as antipyretic, analgesic & laxative. Its medicinal properties are recognized in Ayurvedic system of medicine. The herb *Aragvadha* is first mentioned in Charaka Samhita, and the action of *Aragvadha* as *Kandughna* and is *Kusthaghna* also firstly mentioned in the same classic.


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INTRODUCTION
*Cassia fistula* Linn. (family-caesalpinaceae) commonly known as the Golden Shower Indian Laburnum.¹ It is an Indian medicinal plant. It is native to India, the Amazon and Sri Lanka and diffused in various countries including Mexico, Mauritius, South Africa, East Africa, West Indies, China.³ Medicinally it has been various pharmacological activities like antimicrobial, antifungal, antipyretic, analgesic, larvicidal, anti-inflammatory, antioxidant, anti-tumor, hepatoprotective, hypoglycemic activities. *Cassia fistula* is a moderate sized deciduous tree, distributed throughout India. It is 8-15m to 24m in height, with greenish grey smooth bark when young & rough, dark brown when mature. Leaflets 8.12 pair, flowers yellow, long drooping racemes. Pod cylindrical & pulpy. Seeds light brown, hard & shiny. Ayurvedic medicine recognizes the seeds as antibilious aperitif, carminative and laxative.⁴,⁵

**Taxonomical classification**
- **Kingdom:** Plantae
- **Division:** Magnoliophyta
- **Class:** Magnoliopsida
- **Subclass:** Rosidae
- **Order:** Fabales
- **Family:** Fabaceae
- **Subfamily:** Caesalpinaceae
- **Genus:** Cassia
- **Species:** Cassia Fistula

**Other names**
- Hindi: Amaltas
- English: Golden shower
- Gujarati: Garmaalo
- Kannada: Heggake
- Malayalam: Vishnu Konnai, Katkonna
- Marathi: Bahava
- Punjabi: Sumalu
- Tamil: Komare, Konrai
- Telugu: Railkayaa
- Bengali: Sonali, Bandarlatti, Amltas, Rakhalnadi.

**Plant description**
A tropical ornamental tree with a trunks consisting of hard reddish wood, growing up to 40 feet tall. The wood is hard and heavy. It has showy racemes, up to 2" long, with bright, yellow, fragrant flowers. These flowers are attractive to bees and butterflies. The fruits are dark-brown cylindrical pods, also 2' long, which also hold the flattish, brown seeds (up to 100 in one pod) these seeds are in cells, each containing a single seed. Cana fistula is...
a fast-growing, medium-sized, deciduous tree which grows to about 9 meters in height. Leaves are compound, with 4-8 pairs of opposite leaflets. It produces flowers which are golden yellow and hang in flowering bunches of up to 40 cm long earning its common name of "golden shower tree." The ensuing pods are one inch thick, and can reach lengths of 24 inches. *Cassia fistula* is semi-deciduous after flowering. It is an upright, rather narrow tree with an open top, and slightly drooping branches. *Cassia fistula* is a moderate sized deciduous tree, distributed throughout India. It is 8-15m to 24m in height, with greenish grey smooth bark when young & rough, dark brown when mature. Leaves 8 to 12 pair, flowers yellow, long drooping racemes. Pod cylindrical & pulp. Seeds light brown, hard & shiny.

**Botanical description**

**Leaves**
- Leaf arrangement: alternate
- Leaf type: even-pinnately compound
- Leaf margin: entire, undulate
- Leaf venation: pinnate
- Leaf type and persistence: deciduous
- Leaf blade length: 4 to 8 inches
- Leaf shape: elliptic (oval)
- Leaf color: green
- Fall color: no color change
- Fall characteristic: not showy

**Flowers**
- Five bright yellow, widely spaced petals, about 2 inches wide with 10 stamens. Flower cluster held on pendent, terminal racemes.

**Seeds**
- Seeds are oval shape, attach with sticky brown pulp, poisonous.

**Fruit**
- Fruit shape: pod or pod-like, elongated, hanging
- Fruit length: 12 inches or more
- Fruit diameter: 1 inch
- Fruit covering: dry or hard
- Fruit color: purple
- Fruit characteristics: does not attract wildlife; showy.

**PHYTOCHEMICAL STUDIES**

The plant is rich in phenolic antioxidants such as anthraquinones, flavonoids and flavon-3-ol derivatives. *Cassia fistula* the results shows positive for alkaloids, terpenoids, reducing sugars, saponins, tannins, carbonyl, phlobatianin, and steroids. Two new aliphatic compound heptacosanyl-5-hydroxypentadec-2-enoate and octacosan-5,8-diol from the leaves of *Cassia fistula*. Four new compounds, 5-(2-hydroxy phenoxyethyl) furfural (1), (2'S)-7-hydroxy-5- hydroxymethyl-2-(2'-hydroxypropyl) chromone (2), benzyl 2-hydroxy-3,6-dimethoxybenzoate (3), and benzyl 2p-O-D-glucopyranosyl-3,6-dimethoxybenzoate (4), together with four known compounds, 5-hydroxymethylfurfural, (2'S)-7-hydroxy-2-(2'-hydroxy propyl)-5-methylchromone, and two oxyantraquinones, chrysophanol and chrysophaein, were isolated and identified from the seeds of *Cassia fistula*. Roots contain 7- methylphyscien, betulinic acid and sitosterol. The stem bark contains two flanol glycosides and a xanthone glycosides. Sennosides A&B contains highest in new leaves. The secondary metabolites are present in different plant part of *Cassia fistula*. [Fistucacidin (3,4,7,8,4')- pentahydroxyflavan Oxyantraquinone, dihydroxyantraquinone (-) epiafzelechin, (-) epiafzele chin-3-Oglucoside, (-) epicatechin, procyanidin B2, biflavonoids, triflavonoids, rhein, rhein glycoside, sennoside A, sennoside B, chrysophanol, phycin, Kaempferol, leucopelargonidin rhein, fistulin, alkaloids, triterpenes Rhein, volatile oil, waxy and resinous derivatives. 4] Fistic acid, Indoleacetic acid, 3-formyl-1 hydroxy-8- methoxy anthaquinone, 3B-hydroxy- 17-norprimar-8(9)-en-15-one Chrysophanol Rhamnetin-3-O-gentiobioside Proanthocyanidins, flavonoids and Gibberelic acid.

**ANTIMICROBIAL STUDIES**

Antimicrobial activity

Antifungal activity of leaf extract of cassia fistula was reported.

In-vitro Antibacterial Activity observed in Leaf and Root Extract of *Cassia fistula*.

Antibacterial and Antifungal activity from extract of *Cassia fistula* antibacterial activity of *Cassia fistula* was detected and reported.
Hepatoprotective activity
The n-heptane extract of *Cassia fistula* showed significant hepatoprotective activity which was comparable to that of a standard hepatoprotective agent. The ethanolic leaf extract on liver injury induced by diethylnitrosamine (DEN) was investigated and observed that ELE of *Cassia fistula* Linn. Protects the liver against DEN induced hepatic injury in rats.25

Effect of *Cassia fistula* Linn. leaf extract on diethylnitrosamine induced hepatic injury in rats.26

Aqueous Extract Of Fruit Pulp Of *Cassia fistula* Against Carbon Tetrachloride (CCL4) Induced Liver Damage In Albino Rats was reported.27

Ethanol extract of bark of *Cassia fistula* was used in the hepatoprotective activity.28

Antidiabetic activity
Aqueous extract of *Cassia fistula* (Linn.) flowers (ACF) was screened for its antioxidant effect in alloxan induced diabetic rats. And seeds of *Cassia fistula* were investigated for their hypoglycemic activity. They were found to have marked hypoglycemic activity on normal albinos but not on alloxan produced diabetic albino rats.29,30

The mechanism of hypoglycemic and antidiabetic action of hydro alcoholic extract of *Cassia fistula* Linn. in rats.31

The antidiabetic potential of the total alcoholic extract & its ethyl acetate fraction of the bark of *Cassia fistula* was studied in alloxan induced diabetic rats. The ethyl acetate fraction exhibited significant reduction in blood glucose levels than alcoholic extract. The activity was found comparable with standard drug glibenclamide.32

Anti-inflammatory
The anti-inflammatory property of aqueous extract of leaves and fruits of *Cassia fistula* was reported.33

Antitussive activity
The methanol extract of *Cassia fistula* was investigated for its effect on a cough model induced by sulphur dioxide gas in mice. It exhibited significant antitussive activity when compared with control in a dose dependent manner.34

Antiucler activity
The ethanol leaf extract (ELE) of *Cassia fistula* Linn. (Caesalpinaceae) was evaluated for antiulcer activity against pylorus ligation-induced gastric ulcer.35

Wound healing activity
*C. fistula* treated rats showed, better wound closure, improved tissue regeneration at the wound site, and supporting histopathological parameters pertaining to wound healing.36

Antitumor activity
Effects of methanolic extract (ME) of *Cassia fistula* seed on the growth of Ehrlich ascites carcinoma (EAC) and on the life span of tumour bearing mice were studied. ME treatment showed an increase of life span, and a decrease in the tumour volume and viable tumour cell count in the EAC tumour hosts.37

Hypolipidimic activity
The effect of 50% ethanolic extract of *Cassia fistula* Linn. Legume was assessed on serum lipid metabolism in cholesterol fed rats. The effect of 50% ethanolic extract of *Cassia fistula* legume was assessed on serum lipid metabolism in cholesterol fed rats.38

Protease - inhibitory activity
The *Cassia fistula* seed PI is homologous to the family of plant defensins (γ-thionins), which have four disulfide linkages at highly conserved locations. The *Cassia fistula* PI inhibits trypsin and is the first known example of a plant defensin with protease inhibitory activity, suggesting a possible additional function for some members of this class of plant defensive proteins.39

Antilaishmanial activity
Hexane extract from the fruits showed significant antileishmanial activity against the promastigote form of Leishmania L. chagasi.40

CNS activity
The methanol extract of the seed of *Cassia fistula* was tested for different pharmacological actions in mice. A depressant action of ME was also evident from the behavioural studies on mice. These results contribute with novel antiprotozoal compounds for future drug design studies.41

Antiparasitic activity
The fractionation through bioguided antileishmanial activity of the dichloromethane extract of *Cassia fistula* fruits (Leguminosae) led to the isolation of the active isoflavone biochanin A, identified by spectroscopic methods.42

Anti-itching activity
Vicharchika (eczema) is a chronic skin disease with no permanent cure in modern medicine. Raised serum IgE level is the commonest immunological marker for eczema. This study suggests of significant efficacy of Aragvadha on the patients of Vicharchika (eczema).43

REFERENCES


