

Cassia fistula Linn as a Golden Drug in Ethnomedicine - A Review

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Abstract: *Cassia fistula*, commonly known as the Golden shower Tree or Indian Laburnum, is a widely recognized medicinal plant with a rich history of traditional use in various indigenous healing systems. This review article provided a comprehensive overview of the medicinal uses of *Cassia fistula*, summarizing the phytochemical composition and pharmacological properties that make it a valuable resource in the field of natural medicine. The review begins by discussing the botanical characteristics of *Cassia fistula*, providing insights in to its distribution and cultivation, along with a focus on the various parts of the plant used for medicinal purposes. It then delves into the phytochemical constituents found in *Cassia fistula*, highlighting its secondary metabolites, such as anthraquinones, flavonoids, saponins, and phenolic compounds, which are responsible for its therapeutic effects. The article explores the wide range of pharmacological activities associated with *Cassia fistula*, including its antioxidant, anti-inflammatory, antimicrobial, antidiabetic, hepatoprotective, and immunomodulatory properties. It also discusses potential mechanisms of action underlying its therapeutic effects, shedding light on the pathways and targets affected by its bioactive compounds. The review highlights the importance of standardized extraction and formulation methods to ensure consistent and effective medicinal products derived from *Cassia fistula*. The rich phytochemical composition and proven pharmacological properties make this plant a promising candidate for further research and development of natural therapeutic agents.

Keywords: *Cassia fistula*, anticancer, antidiabetic, laxative

1. Introduction

Cassia fistula, known by various vernacular names such as the golden shower tree, Indian Laburnum, and Amaltas, is a revered botanical entity deeply rooted in traditional healing systems across the globe. This tropical tree, characterized by its striking clusters of bright yellow, pendulous flowers, has been celebrated not only for its ornamental beauty but also for its manifold medicinal properties. In this era of exploring natural remedies and harnessing the therapeutic potential of plants, *Cassia fistula* stands as a remarkable exemplar of nature's pharmacy. Native to the Indian subcontinent, *Cassia fistula* has been an integral part of traditional medicine in South Asia for centuries. Various parts of the tree, including the flowers, fruits, leaves and bark, have found applications in addressing a spectrum of health concerns. While traditional knowledge has long recognized the plant's curative potential, contemporary scientific research is providing substantive evidence to support these age-old claims. The pharmacological potency of *Cassia fistula* is attributed to its rich phytochemical composition, comprising bioactive compounds such as anthraquinones, flavonoids, saponins, and phenolic compounds. These constituents have been the subject of rigorous investigation, shedding light on their diverse therapeutic properties, including antioxidant, anti-inflammatory, antimicrobial, antidiabetic, hepatoprotective, and immunomodulatory activities. This review aims to provide a comprehensive overview of the medicinal uses of *Cassia fistula*, exploring its botanical attributes, phytochemical constituents, and the plethora of pharmacological benefits it offers. These properties have led to its use in the treatment of various health conditions, such as skin disorders, gastrointestinal ailments, diabetes, and liver disorders, among others. Furthermore, the article examines the scientific evidence supporting the traditional uses of *Cassia fistula*, with a particular focus on recent research studies and clinical trials. It seeks to bridge the gap

between traditional knowledge and contemporary science, synthesizing the wisdom of generations with the findings of modern research. By delving into its history and delving into its promising applications in various healthcare domains, this review highlights the potential of *Cassia fistula* as a valuable resource in the realm of natural medicine. Moreover, it underscores the need for further exploration to fully harness its therapeutic potential, standardize its usage, and ensure its responsible incorporation into healthcare practices, all while respecting its traditional roots and cultural significance.

Taxonomic Classification

Kingdom - Plantae
 Division - Mangoliophyta
 Class – Magnoliopsida (Dicotyledons)
 Order - Fabales
 Family - Fabaceae /Leguminosae
 Genus – Cassia
 Species - fistula

Vernacular names

Bengali - Sonali, Soondali, Sondal, Bandarlatti, Rakhalnadi
 English - Indian Laburnum, Purging Fistula, Cassia, Golden flower.
 Gujarati - Garmaalo
 Hindi - Sonhali, Amaltas, Samyaka
 Kannada– Kakkemara, Heggake
 Malayalam – Kanikonna, vishu konna, manjakonna
 Marathi - Bahava
 Tamil - Shrakkonnai, Konai, Irjviruttam, Konnaimaram
 Telegu - Kondrakayi, Raelachettu, Aragvadamu, Koelapenna
 Sanskrit - Nripadruma, Aragvadhoma, Karnikaram
 Urdu –Amaltaas

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Plant Description

A medium sized deciduous tree, 8-15 m in height with greenish grey smooth bark when young, and rough when old, exfoliating in hard scales, leaves 20-40cm long, pinnately compound, leaflets 4-8 pairs, ovate, acute, brightly green glabrous above, paler and silvery-pubescent beneath when young, main nerves numerous; flowers bright yellow in lax pendulous racemes; fruits cylindrical pods, 30-60 cm long, shortly stipitate, nearly straight, smooth, shiny, brownish black; seeds broadly ovate, horizontally immersed in dark coloured sweetish pulp.

Chemical constituents

The plant contains sennosides A and B, rhein and its glucoside, barbaloin, aloin, formic acid, butyric acid, and their ethyl esters and oxalic acid, sap, acetyl acid, iod, thiocyanogen, and unsapon matter, tannins, phlobaphenes, reducing sugars and oxyanthraquinones. Pulp of the pod contains anthraquinone glycosides, sennosides A & B, rhein and its glucoside, barbaloin, aloin, formic acid, butyric acid and their ethyl esters and oxalic acid, presence of pectin and tannin is also reported (Khare, 2007; Agarwal, and Paridhavi, 2005). Seeds give galactomannan free sugars and free amino acids; flowers contain ceryl alcohol, kaempferol, rhein and a bianthraquinone glycoside, fistulin. Leaves contain free rhein, its glycosides- sennosides A & B (Khara, 2007) Leaves and flowers also contain anthraquinone, tannin, oxyanthraquinone, rhein and volatile oils (Gupta, 2010; Chopra et al, 2006). Pulp consists of sugar, gum, astringent matter, gluten, coloring matter and water [Nadkarni, 2009; Agarwal, and Paridhavi, 2005]. Root bark besides tannins contains phlobaphenes and oxyanthraquinone substances Chopra et al, 2006). The plant contains rhein glucoside, rhein, fistulic acid, sennoside A & B (Gupta et al, 2008,)

Pharmacological Activities

The whole plant possesses medicinal properties, the various parts such as flowers, fruits, leaves, and bark have been utilized for their therapeutic activities.

Antimicrobial Activity

Cassia fistula exhibits antimicrobial properties, which can help combat bacterial and fungal infections. It has been used to treat wounds and skin infections (Nirmala et al, 2008; Prashanth et al, 2006; Rajan et al, 2001)

Anti-inflammatory Activity

The plant possesses anti-inflammatory properties, making it useful for reducing inflammation and pain associated with conditions like arthritis and joint disorders. (Morimoto et al 1988; Raju et al, 2005)

Anti-skin disorders Activity

The pulp and leaves of *Cassia fistula* are traditionally used to treat various skin conditions. A paste made from these parts can be applied topically to soothe skin problems like rashes, acne, and itching (Alam et al, 1990; Asolkar et al, 1992)

Hepatoprotective activity

The plant has been investigated for its hepatoprotective properties, which means it may help protect damage caused by various toxins and diseases. (T. Bhakta et al, 2001; 1999)

Antioxidant activity

Cassia fistula contains antioxidants, such as flavonoids and phenolic compounds, which can help protect cells from oxidative damage. These antioxidants contribute to the plant's anti-aging and general health benefits. (P. Sindhuraj et al, 2002)

Anticancer Activity

Laboratory experiments were conducted in rats and the reports are available on the anticancer activity of different extracts of bark and seed of *Cassia fistula*. (Gupta et al, 2000; Muthusamy et al, 2006)

Laxative Activity

The pulp from the matured fruit pods of *Cassia fistula* has strong laxative properties. It is often used as a natural remedy to relieve constipation. This laxative effect is attributed to compounds like anthraquinones in the plant. (M.A. Akanmu et al, 2004)

Anti-diabetic Activity

Some research suggests that *Cassia fistula* may have antidiabetic properties, potentially helping to lower blood sugar levels. The hypoglycemic effect of hexane derived extract of this plant was studied in albino rats and it was found that the extract has marked hypoglycemic activity on normal albino rats. (Theesan et al, 2007; Alam et al, 1990; Asolkar et al, 1992)

Anti-ulcer Activity

Reports are available on the anti-ulcer activity of the ethanol leaf extract of *Cassia fistula* against pylorus ligation induced gastric ulcer in experimental rats (Karthikeyan and Gobianand, 2010)

Hypolipidemic Activity

Laboratory experiments were conducted to test the effect of ethanol fruit extract of *Cassia fistula* on serum lipid metabolism in cholesterol fed rats and it was found that the serum total and LDL cholesterol, triglycerides and phospholipids were reduced significantly after 90 days of study (Gupta & Jain, 2009; El-Saadany et al, 1991)

Mosquito, Pest, and disease control

It is reported that the leaf extracts of *Cassia fistula* inhibited the hatching of eggs and its viability to develop in mosquitos and it is a promising larvicidal and ovicidal agent against them. The extracts also showed activity against different pest and disease-causing organisms in experimental conditions. (P. Sartorelli et al, 2009; Govindarajam et al, 2008; Ashok & Yadav, 2003; Raja et al, 2000; Sharma & Basandraj, 1999; Jaipal et al, 1983)

2. Conclusion

The review of the medicinal uses of *Cassia fistula* illuminates this remarkable botanical entity as a treasure trove of therapeutic potential. The traditional knowledge that has revered this plant for generations finds resonance with modern scientific research, reaffirming the credibility of its healing properties. *Cassia fistula*'s diverse phytochemical composition, including anthraquinones, flavonoids, saponins, and phenolic compounds, underpins its

multifaceted pharmacological activities. Form its antioxidant and anti-inflammatory effects to its antimicrobial, antidiabetic, hepatoprotective, and immunomodulatory actions, this tree offers a broad spectrum of remedies for numerous health conditions. While the historical and contemporary significance of *Cassia fistula* in natural medicine is undeniable, it is essential to exercise caution and responsibility in its use. The laxative properties of some of its components, particularly the pods and seeds, warrant careful dosage considerations and expert guidance. Standardization of extraction and formulation methods is vital to ensure consistency and delicacy in medicinal products derived from this plant. Despite the promising strides in understanding the therapeutic potential of *Cassia fistula*, there remains a need for more extensive research to unlock its full range of applications and mechanisms of action. Clinical trials and in-depth studies are necessary to establish safe and effective dosages for specific health conditions. Furthermore, the cultural and historical significance of *Cassia fistula* should not be overlooked. It stands not only as a source of healing but also as an emblem of tradition and heritage in the region where it has been cherished for centuries.

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