

# Cassia fistula Linn.: A Comprehensive Review on Its Phytochemical Constituents and Pharmacological Properties

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**Abstract:** *Cassia fistula* Linn. (Family: Caesalpinaceae), commonly known as 'Sonali' or 'Bandarlati,' has been widely utilized in traditional medicine for treating various ailments. Native to Bangladesh and other Asian countries, including India, China, Hong Kong, the Philippines, Malaysia, Indonesia, and Thailand, this plant has been recognized for its diverse pharmacological properties. This review provides a comprehensive analysis of the phytochemical constituents and therapeutic potential of *Cassia fistula*. Traditionally, it has been used for managing diabetes, hematemesis, leucoderma, pruritus, intestinal disorders, and as an antipyretic, analgesic, and laxative. The plant's fruits, stem bark, and leaves contain several bioactive compounds, including anthraquinones, flavonoids, flavon-3-ol derivatives, alkaloids, glycosides, tannins, saponins, terpenoids, reducing sugars, and steroids, which contribute to its medicinal properties. Extracts from the fruit and stem bark have demonstrated various pharmacological activities such as antipyretic, anti-inflammatory, antioxidant, antidiabetic, hypolipidemic, hepatoprotective, antimicrobial, antitumor, and antiulcer effects. This review highlights the therapeutic significance of *Cassia fistula* and its potential applications in modern medicine.

**Keywords:** *Cassia fistula*, phytochemicals, traditional medicine, pharmacological properties, bioactive compounds, antioxidant, antimicrobial, antidiabetic, hepatoprotective, anti-inflammatory

## I. INTRODUCTION

*Cassia fistula* Linn, commonly known as the golden shower tree, belongs to the Caesalpinaceae family. Bengali name: Sonali or Bandor Lathi. Widely used for its medicinal properties, particularly as a mild laxative for children and pregnant women. Functions as a purgative due to the presence of wax aloin and also has tonic properties. Used for intestinal disorders like healing ulcers. The World Health Organization (WHO) states that: Over 70% of the global population relies on traditional medicine for healthcare. Around 80% of people in developing countries use herbal medicine for primary healthcare. Plant-based medicines are considered less toxic and have fewer side effects than synthetic drugs. Traditional uses in medicine: *Cassia fistula* is widely used in Unani and Ayurvedic medicine. Treats skin diseases, liver disorders, tuberculous glands, haematemesis, pruritus, leucoderma, and diabetes. Used as an infusion, decoction, or powder alone or with other medicinal plants.

- Scientific studies confirm its properties: Analgesic, anti-inflammatory, antioxidant, antidiabetic, and hepatoprotective activities.
- Critical evaluation required for its benefits as many self-limiting conditions are traditionally treated with *Cassia fistula*.

### Plant Description:

Moderate-sized deciduous tree, up to 10 m tall. Leaves: Alternate, pinnate, 30-40 cm long, with 4-8 pairs of ovate leaflets (7.5-15 cm long, 2-5 cm broad). Flowers: Yellow, pendulous clusters. Fruits: Cylindrical, brown, 25-50 cm



long, 1.5-3 cm diameter, containing 25-100 seeds. Seeds: Lenticular, light brown, and lustrous. Grows in Bangladesh, India, China, Hong Kong, the Philippines, Malaysia, Indonesia, and Thailand.

**Taxonomic Classification:**

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

**Vernacular Names:**

English: Golden Shower Hindi: Sonhali, Amultus Marathi: Bahava Sanskrit: Nripadruma Tamil: Shrakkonnai, Konai Telugu: Kondrakayi, Raelachettu Gujarati: Garmala Punjabi: Amaltaas, Kaniyaar Urdu: Amaltaas

**Traditional Uses:**

Used as a mild laxative (safe for children). Leaves and bark (in high doses) can cause vomiting, nausea, abdominal pain, and cramps. Used for: Tumors (abdomen, glands, liver, stomach, throat) Burns, cancer, constipation, convulsions, delirium, diarrhea, dysuria, epilepsy, hematuria, pimples, glandular tumors Ayurvedic medicine: Seeds: Antibilious, aperitif, carminative, laxative Root: Used for adenopathy, leprosy, syphilis, skin diseases, tubercular glands Leaves: Used for malaria, rheumatism, ulcers Buds: Used for biliousness, constipation, fever, leprosy, skin disease Fruit: Used for abdominal pain, fever, heart disease, leprosy

**Economic Uses:**

Used as firewood in Mexico. Wood: Reddish, hard, durable, suitable for cabinetwork, farm tools. Bark: Used in tanning. Drug: "Cassia fistula" (mild laxative) obtained from the seed pulp.

**Phytochemical Composition**

- Rich in phenolic antioxidants, including anthraquinones, flavonoids, flavan-3-ol derivatives. Seeds: Contain 2% anthraquinones, 24% crude protein, 50% carbohydrates. Leaves: Contain 15.88% protein, 6.65% fat, 20% fiber, 39.86% carbohydrates.
- Bioactive compounds: Fistulic acid, rhein, galactomannan, sennosides A & B, tannins, Emodin, chrysophanic acid, fistuacacidin, barbaloin Lupeol, beta-sitosterol, hexacosanol

**Pharmacological Activities:**

- Antidiabetic: Reduces blood glucose levels (ethyl acetate fraction of bark). Exhibits hypoglycemic and anti-diabetic effects.
- Hypolipidemic: Improves serum lipid metabolism in cholesterol-fed rats.
- Hepatoprotective: Protects against liver damage from carbon tetrachloride, diethylnitrosamine, bromobenzene.
- Antioxidant: Methanol and aqueous extracts show strong antioxidant activity.
- Antipyretic: Methanol extract of buds shows fever-reducing effects.
- Anti-inflammatory: Aqueous extracts of leaves & fruits reduce inflammation.
- Antitussive: Methanol extract reduces cough symptoms.
- Antileishmanial: Hexane extract of fruits shows activity against Leishmania chagasi.
- CNS activity: Methanol extract of seeds exhibits depressant effects in mice.
- Antimicrobial: Antibacterial and antifungal activities observed in leaf & root extracts.
- Antitumor: Methanol extract of seeds reduces tumor size in Ehrlich Ascites Carcinoma (EAC) models.
- Larvicidal & Ovicidal: Effective against Culex quinquefasciatus & Anopheles stephensi.
- Antiulcer: Ethanol leaf extract prevents gastric ulcers.
- Wound Healing: Methanol extract of leaves enhances wound healing.



## II. CONCLUSION

Cassia fistula has multiple medicinal uses, particularly in Ayurveda & Unani medicine. Contains important bioactive compounds such as tannins, flavonoids, glycosides. Effective in treating liver disorders, inflammation, cough, infections, and wounds. Rich in essential oils, volatile components, phytol, and kaempferol. Further scientific research needed to explore its full pharmaceutical potential.

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