



A Pharmacognostic And Pharmacological Review On *Cassia Fistula* Leaf.

¹Akash Shelke, ²Pradnya Yede, ³Ritu Deokar.

¹Assitant Professor, ²Student, ³Student.

Department of Quality Assurance Techniques,
Shree Swami Samarth institute of pharmacy, Malwadi (Bota).
India- 422602

Abstract:

The medium-sized deciduous tree *Cassia fistula*, which belongs to the Caesalpiniaceae family, is well-known in Indian traditional medicine. People living in tropical and subtropical regions have historically used this plant to treat a variety of illnesses. For the correct identification of similar looking species, there should be well documented characteristics of plant. The present study laid down the morphological and pharmacological standards of *Cassia fistula* leaflets. The study have some important and easy method for constituent extraction from leaf. The extracts are rich in maximum number of phytoconstituents like alkaloids, flavonoids, glycosides, phenols, tannins and carbohydrates.

The aim of the study is that increase the knowledge regarding this plant and promote the research on it.

Keywords: *Cassia fistula*, medicine, morphology, extraction, leaf.

Introduction:-

Cassia Fistula Linn. also known as the golden shower tree (Bengali name: Sonali or Bandor lathi). The family of *Cassia Fistulae* is Caesalpiniaceae, is widely used for its medicinal properties. Of this children plant is widely used for the main property is laxative Suitable for and pregnant women.^[1] In developing countries 80% population using traditional medicine in primary medical problem^[2,3] plant drugs & herbal Formulation are frequently considered to be less toxic & Free From side effects than Synthetic one Side effects.^[4] In traditional medicine, *Cassia Fistula* is one of the most commonly fistula is used Plant in Unani & Ayurvedic medicines. this Plant has been described to be Useful against skin diseases, liver troubles, tuberculous glands and its use in the treatment of haematemesis, pruritus, leucoderro & diabetes has been suggested.^[5] In modern times, and controlled Clinical trials, commercial preparations have tended to be Standardized extracts of the whole plants. The plants has documented to possess analgesic, anti-inflammatory, antioxidant, antidiabetic as well as hepatoprotective activity. Since many disease conditions commonly treated with *Cassia Fistula* in traditional medical systems are considered self-liming its purported benefits need critical evaluation.^[6-10]

Plant Description:

- Cassia Fistula is moderate size a deciduous tree 10 m. tall, Flowers yellow, leaves alternate, pinnate 30 -40 CM long with 4-8 pairs of Ovate leaflets, 7.5-15 cm long, 2-5 Cm broad, Fruits pendulous, cylindrical, brown, Septate 25-50 cm long 1.5-3 cm in diameter. with 25-100 fistula grows throughout in Bangladesh and in many other Asian countries and is used as traditional herbal medicine in India, China, Hong Kong, Malaysia, Indonesia



Fig. 1: mature plant of *Cassia Fistula*

Taxonomy of *Cassia Fistula*:

- Kingdom: Plantae
- Subkingdom: Tracheobionta
- Super division : Spermatophyta
- Division: Magnoliophyta
- Class: Magnoliopsida
- Subclass: Rosidae
- Order :Fabales
- Family: Fabaceae
- Genus: Cassia
- Species :Fistula

Vernacular Name:

- Bengali :Bundarlata, sonali
- English: Golden Shower
- Gujrati: Garamala
- Hindi: Sonhali, Amultus
- Kannad: kakkemara
- Marathi: Bahava
- Srilanka: Aehaela-gaha ^[11, 12, 13, 14]

Chemical constituents of various parts of *Cassia Fistula*:

Plant Parts	Constituents
Bark	The stem bark contains lupeol, Beta- sitosterol and hexacosanol ^[15]
Leaves	Leaves is contain heptacosynyl-5-hydroxypentadec-2-enoateoctacosan-5 and 8-diol Rhein, chrysophanol and physcion ^[16,17]
Pod	Pod contains Rhein glycoside and ferulic acid, ceryl alcohol, anthraquinone and tannin ^[18,19]
Flower	Flower contain kaempferol , leucopelargonidin tetramer, Rhein, fistulin and triterpene ^[20]
Seed	Seeds contain glycerides with linolic, oleic, stearic and palmitic acid as chief fatty acids. Others :Benzyl-2-hydroxy-3, 6-dimethoxybenzoate and benzyl -2- Beta -o-d-glucopyranosyl-3chrysophenol, chrysopheneinhanein, galactomannan ^[21-23]

Table 1: plant and chemical constituent in *Cassia Fistula*

Morphological Classification of *Cassia Fistula* Linn. Leaves

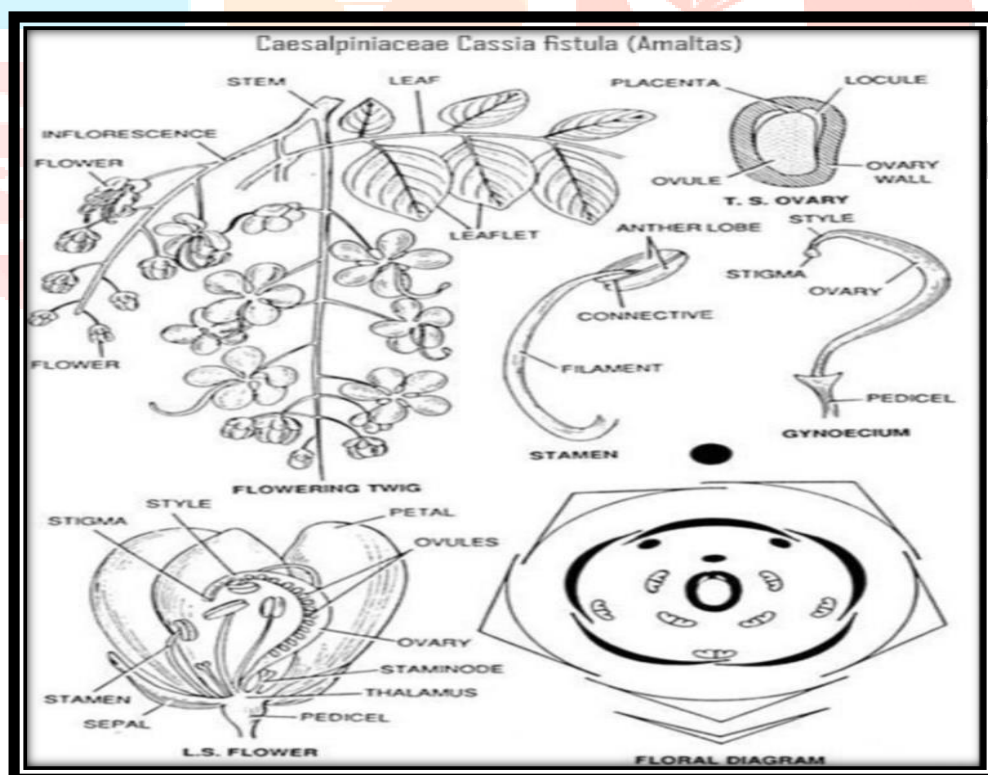


Fig 2: Morphology of *Cassia Fistula* leaves

Morphological characteristics of leaves:

- **Leaves:**
 - They have pinnate, compound, alternate and stipulate leaves. The stipules are modified into thrones.
 - Ramal and cauline, petiolate, stipulate, (stipules caduceus), alternate, paripinnately compound, pulvinus present at the base of leaf.
 - Size :30-40 cm long
- **Leaflets:**
 - 4-8 leaflets, opposite, sub sessile, ovate, entire, reticulate unicostate, glabrous.
 - Size: (7.5 -15 cm X 2-5 cm) long
- **Stomata**
 - **Type of Stomata:** Ventral Epidermis-Paracytic
 - **Stomatal Number:** 329.80 ± 7.54 (320-342)
 - **Trichomes Number:** Dorsal Epidermis=29-34
Ventral Epidermis =90-98
 - **Trichomes:** Dorsal Epidermis and Ventral Epidermis (Unicellular non- glandular)
 - **Palisade Ratio:** 8.33 ± 0.39 (8-9)

Medicinal properties and Uses of *Cassia Fistula* leaves

Leaves of *amaltus* (*Cassia Fistula* linn.)

The leaves of *amaltus* are laxative and used externally as emollient a poultice is used for insect bites swellingrhematism and facial paralysis. Leaves also possess antiperiodic and laxative properties. They are specially used in jaundice, piles, rheumatism ulcer and also externally eruption, ring worm and eczema. Juice of leaves is useful as a dressing, relieving irritation and relief of dropsically swelling. *Cassia Fistula* is a medicinal plant with extensive pharmacological properties as it contains significant amount of metabolites and bioactive compounds. So this plant is used for antioxidant antimicrobial, anti-inflammatory, antidiabetic, antitumor, hepatoprotective, Antipyretic, Purgative, hypolipidemic, antileshmnatic and Larvicidal & ovicidal potential.

- *Cassia Fistula* Leaf Extract inhibited the Growth of *L. donovani*. :
It was found that *C. fistula* treatment reduced the promastigote proliferation in a time and dose-dependent manner. *C. fistula* leaf methanolic extracts incubating. That was determined by incubating the parasites at different concentration.
- Cytotoxicity Evaluation of *C.fistula* leaf Extract-
To evaluate the cytotoxic effect of *C. Fistula* leaf methanolic extract, *C. Fistula* was found Safe and least cyto- toxic OF on human macrophages with a CC15 of 626 ± 39 microgram per ml
- Effect of *C. Fistula* leaf Extract on the Intramacrophagic parasites :
After infection *L. donovani* parasites internalize inside macrophages & transform into amastigotes form. These amastigotes are non-motile & define the parasite pathogenicity. These amastigote phase parasites are in the clinically relevant form, so it is important to check the effect of *C. fistula* extract on them.
- *C. Fistula* Leaf Extract Introduced Apoptosis In Parasites In Vitro :-
Further to evaluate whether *C. fistula* mediated antieishmanial activity was based on apoptosis induction in parasites, we performed the annexin. V/PI apoptosis assay. Parasites were treated with different conc. of methanolic leaf extracts.

The leaves Contain various types of phytochemical is present

Extraction Process of Cassia Fistula Leaves

The extraction of the Cassia Fistula leaves was carried out using known standard procedures. [24] The plant materials were dried in shade and powdered in a mechanical grinder.

1. The powder (25.0 g) of the plant materials were initially defatted with petroleum ether (60-80°C), followed by 900 ml of hydroalcohol by using a Soxhlet extractor for 72 hours at a temperature not exceeding the boiling point of the solvent.
2. The extracts were filtered using Whatman filter paper (No.1) while hot, concentrated in vacuum under reduced pressure using rotary flask evaporator, and dried in a desiccator.
3. The hydroalcoholic extract yields a dark greenish solid residue weighing 5.750 g (23.0% w/w). More yields of extracts were collected by this method of extractions.
4. The extracts were then kept in sterile bottles, under refrigerated conditions, until further use.
5. The dry weight of the plant extracts was obtained by the solvent evaporation and used to determine concentration in mg/ml. The extract was preserved at 2- to 4°C.
6. This crude extracts of hydroalcohol was used for further investigation for potential of antimicrobial properties.

Habitat of *C. Fistula*

Cassia Fistula is a free deciduous forests ranging from tropical to moist through subtropical Forest Zones. THIS Found From up to on Sea level altitude of 1300 m. It is occurs. Dry, Shallow On mountain slopes as well as on better Sites. It is Ornamental plants. In tropical & Subtropical areas. It blooms in late spring / early summer in hot, dry weather

Microscopic Evaluation of *Cassia Fistula* Leaves

In this report, we present the results of the microscopy, seasonal variations and spectrophotometric estimation of hydroxy- anthraquinone glycosides of cultivated Cassia fistula Linn. The total glycoside contents of the morphological parts of this species at different stages of growth are also presented. The study shows that anthraquinone glycosides are concentrated in the leaves (1.75%) and flowers (1.58%) at peak flowering. Notable seasonal variations were observed in the cultivated species. Hydroxyanthraquinones reached peak levels during the months of September (1.08%) and October (2.20%). There was a significant drop ($P < 0.05$) in glycoside content during most part of the rainy season. It has been established that anthraquinone glycosides, rather than the aglycones, are the active forms and hence an estimation of the total glycoside content of a sample is a reliable indication of biological activity. The advantages of using the natural anthraquinone laxative when the glycoside content is highest are discussed. The study has provided useful information on the best period for harvesting the morphological parts of *C. fistula* for drug development. Vascular Bundles are bicollateral. Calcium oxalate prism crystals sheath is present below the vascular bundles. pericyclic fibres are found surrounding the vascular bundle. Ground tissue consists of loosely arranged polygonal parenchymatous cells followed by lower collenchyma and lower epidermis.

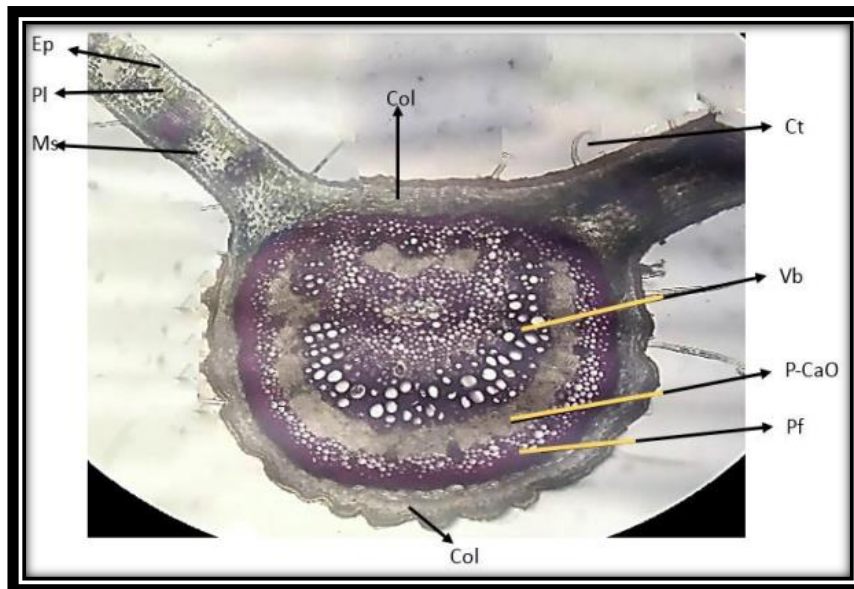


Fig 2: Transverse section of *Cassia fistula* leaflet; lignified cells.

Ct: covering trichome; Col: collenchyma; Ep: epidermis; Ms: mesophyll; Pl: palisade cells; P-CaO: parenchyma with calcium oxalate; Pf: Pericyclic fiber; Vb: vascular bundle

Conclusion

Many research studies it is concluded that *Cassia fistula* is responsible for the various therapeutic potential like antidiabetic, hepatoprotective, anticancer, antibacterial, wound healing, laxative, CNS activity, anti-ucel, anti-inflammatory, antioxidant, it is also useful herbal plants for hepatic disorder & lipolipidic activity. With the help of parts of *C. fistula* plants mainly in leaves. The present study provides in-depth application, morphological preliminary identification and quantification of biologically active phytoconstituents which also provide pharmacopoeia standards for easy identification of the *C. fistula* leaflets. Hence, differentiating it from closely related species.

References

1. Satyavati GV, Sharma M., In Medicinal plant in india, TCMR, New Delhi, 1989.
2. Bailey C. J and C. Day, Diabetes Care. 12, 543, 1989 doi: 10. 2337 / diacare. 12.8.553
3. Grover J.K. Yadav S., & vats V. Medicinal Plants of India with antidiabetic potential. J Ethnopharmacol. 2002, 81:81-100.
4. Bailey CJ, Day C: Traditional treatments for diabetes: Diabetes Care, 1989; 12: 553-564
5. Dutta A, De B. seasonal variation in the Content the Seppo sides and rhein in leaves. And pods of *Cassia fistula*. Indian J. Pharma- Col· 'Sci. 1998; 60: 388-390
6. N.W. Sheikh, R.D. Patel, N.I. upwar, N.K. Maho- bia, M. V. seth, U. R. Panchal, Analgesic Study of methyl alcohol extract of *cassia. fistula* pod, J. Pharmacy Res., 2010; 3(9), 2218-2219.
7. Luximon – Ramma, A., Bahorun, T. soobruttee, M.A. and Aruoma, O. I. Antioxidant activities. Of phenolic, procinthyocyanidin, & flavonoid components in extracts of *Cassia fistula* J Agric Food chem. 2002 So(18): 5042-5047
8. Ilavarasan R, Mallika M. and Venkataraman. S Anti-inflammatory & antioxidant activity Of *Cassia fistula* Linn. Bark extracts AFT. J Trad. CAM, 2005; 2(1): 70-85

9. Malpani S.N et al. Antidiabetic Activity of Cassia Fistula Linn Bark in Alloxan Induced. Diabetic Rats. *Anti.j. Phur. Sci. and Res.* Jan-April, 2010; (2)1 382-385.
10. Bhakta, T., Banerjee, S., mandal. S.C maity, T.K., saba, B.P and pal, M., Hepatoprotective activity of Cassia Fistula leaf extract, *phytomedicine.* 2001; 8(3): 220-224.
11. Ali MA. Cassia Fistula linn: a review phytochemical & pharmacological studies. *Int J' pharm sci Res* 2014; 5: 212530
12. Doblin Sandai, Bassel Al-Hindi, khirun musa, Posline Sandai. Botanical churuden Sties, nutritional properties, therapeutic Potential 4 Safety profile of Cassia Fistula linn: a review update. "EC" *pharmacol Toxicol* 2019, 7:94-106.
13. M. Ashraf Ali Cassia Fistula linn: a review of phytochemical & pharmacological. *Studies. Int. J. pharm. Sci. Res.,* 5.00% 2014, P. 2125
14. K. Gobianand, P. vivekanandan, K. Pradeep, C.VR mohan, S Karthikeyan Anti-inflammatory & antipyretic activities of Indian medicinal plant Cassia Fistula linn. (Golden). Shower) in Wistar Albino rats.
15. Sen AB, shukia YN. Chemical examination OF Cassia Fistula. *J Indian chem. SoC* 1968 45: 744.
16. Singh RS, Singh H, Pandey Hs, Pandey RP... Singh 5. Two new aliphatic compounds. From Cassia Fistula Linn *Indian J chem* 2005 44 2372-4
17. Mahesh VK, Sharma R, Singh RS. Anthraquinone. Hes and Kaempferol from Cassia Fistula species. *J Natpred* 1984; 47: 733-51.
18. Chopra RN, Nayar SL, Chpora Ic. Glossary OF In dian medicinal plants, national institute of resources *Science Communication & information resource.* 2006 P.54
19. Ching Kuo Lee, Ping Hunglee, Yueh Hsiung Kuo. The chemical Constituents From the aril Cassia Fistula linn. *J. Chin chem Soc* 2001:48: 1053-8.
20. Kumar A, Pande CS. KaulRK. Chemical examinati- of Cassia Fistula nowers. *Indian J chem.* 196; 4:460.
21. Abu Sayeed M. Abbas AM, mohal khan GR, Rahman MS. Studies on the characterization and glyceride composition of Cassia Fistula Seed oil. *Bangladesh J Sci Ind Res* 1999; 34:144-8
22. Kuo YH, LeepH, Wein Ys. Four new Compounds from the Seeds OF Cassia Fistula e. *J. Nat prod* 2002 65 1165-7.
23. Lal J. Gupta pc. Partial hydrolysis & the Structure of the galactomannan From Cassia Fistula. Seeds. *planta med* 1976; 30: 378:83.