Indian Journal of Health Care, Medical & Pharmacy Practice Vol 4; Issue 2, July-Dec 2023, ISSN 2583-2069

Review Article

Pharmacological and Pharmacognostical Studies of *Cassia fistula* Linn

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Doi: https://doi.org/10.59551/IJHMP/25832069/2023.4.2.80

Received: 8 Nov, 2023, Decision for Acceptance: 28 Nov, 2023

Abstract:

This study aims to present an extensive and up-to-date review of pharmacological activities, Pharmacognostical studies and traditional medicinal uses of Cassia fistula. The golden shower tree Cassia fistula (Amaltas), which is 8–15 meters tall, is a member of the Leguminosae family. Reddish brown roots, compound leaves with three to eight leaflets each, cylindrical pods, and ovoid seeds are all characteristics of the Cassia fistula stem. Alkaloids, flavonoids, proteins, lipids, and carbohydrates are among the ingredients of Cassia fistulas bioactive. It has a greater impact on treating various illnesses and has antifungal, antibacterial, analgesic, hepatoprotective, and anti-inflammatory properties, among others. A variety of activities have been reported to be present in it, including anthelmintic, antibacterial and wound healing activities. Therefore, the purpose of this article is to present a thorough analysis of the phytochemical constituents, pharmacological characteristics, and pharmacognostic qualities of Cassia fistula.

Keywords: Cassia fistula, Anthelmintic Activity, Anti-leishmaniatic activity, Clastogenic effect, Sedative effect and Anti-anxiety effect, Traditional uses

Introduction:

Natural plants are a gift from nature with significant medicinal value. They support human health and well-being. The plants with a broader range of distribution greatly aid in the treatment of various illnesses. Here, some conventional therapies include Unani homoeopathy, Ayurveda, and Siddha. Traditionally, a wide variety of plants are assessed and employed. The Cassia fistula is one of them. The flowering plant Cassia fistula is a member of the leguminous family (Fabaceae), subfamily Caesalpiniaceae, and is often referred to as Amaltas. It is one of the 400 species that make up the genus Cassia. It is extensively distributed throughout the world's tropical nations, including Mexico, Brazil, East Africa, Thailand, Sri Lanka, Egypt, Mauritius, India, China, and Ceylon. Many

diseases have traditionally been treated with cassia fistula.

Distribution:

Cassia fistula L., a member of the Leguminosae family, is also referred to as pudding pipe tree, India laburnum, purging cassia, Golden Shower in English, and Amaltas in Hindi. The plant is deciduous. Its lovely yellow flowers make it a popular ornamental tree. About 25 to 30 feet tall. It is found throughout the world's subtropical zones, from India to the West Indies. It can be found as a forest 1300 meters up in the outer Himalaya.

Botanical Description

The pinnate, alternating leaves have a length of 1 to 1.5 m. Leaflets measuring 2.5–3 cm in width and 7–15 cm in length. The brown, septate, cylindrical fruit of Cassia fistula is pendulous. The fruit measures roughly 25 to 45 centimeters in length and 1-3 centimeters in diameter. Being deciduous indicates that they lose their leaves once a year. The colour of the seeds is reddish brown, and their texture is lenticular. The colour of the stem bark is brown.

Common Names

Cassia Kunth

Sonalu

Amaltaas

Sondal

Kaniyar

Golden Shower

Sonhali

Bahava

Common Uses

Cassia fistula has commonly been used to treat a variety of conditions, including leukoderma, tuberculosis, metabolic disorders, laxatives, purgatives, and abdominal lumps. Its uses include hematemesis, a broad range antimicrobial agent, skeletal features, burn treatment, menstrual disorders, and uterine, depression, dysuria, and pest control. Its extract also has scavenging properties against free radicals. The root has laxative and purgative properties. The extract from leaves can be used to treat erysipelas, rheumatism, black wart fever, ringworms, eczema, and act as an antitussive and wound healer. Oral sores, swollen throats, and jaundice can all be effectively treated with seeds. The mildly sweet seeds are used as a laxative, cooling agent, and cure for biliousness, skin conditions, and swollen throats. Bark is used as an antidiabetic, antioxidant, and anti-inflammatory medication. Pulp has been utilized for hepatoprotective, and disorders of the abdomen and urinary tract. Pods are a laxative, an antipyretic, and a treatment for diabetes mellitus. Fruit extracts are used as purgatives, antifungal medications, and estrogenic and antiestrogenic drugs. It also goes by the name "disease killer." Additionally effective against tuberculosis is cassia fistula.

Synergistic Effect

There is a synergistic effect between Cassia fistula and Solanum xanthocarpum. They exhibit anti-inflammatory properties even at very low drug concentrations. Traditionally, amoxy-cassia, or

Cassia fistula, was used to boost the host's immunity. Fluconazole and Cassia fistula exhibit synergistic effects.

Pharmacognostic Studies

Every aspect of Cassia fistula has been thoroughly studied. The ornamental, deciduous Cassia fistula tree has golden, yellow flowers. Trunk/stem is straight. The bark is pale when young and turns black as it ages. The leaf is pinnate.

Fruit

Leguminous, smelling strongly, and containing a few seeds. When it ripens, the green pod turns black, according to visionaries. The pods ripen when the flowers shed. The colour of mucilaginous pulp is dark brown. It has a distinct smell and is sticky and sweet. Secondary metabolites, also known as phytochemicals, are thick, flat, or curved particles. They have smooth interior surfaces and rough exterior surfaces. Grey to red hues with reddish specks and distinct flavour are displayed. Pods are elongated. The pods have internal divisions into segments. There is one seed in every segment. Every seed is embedded transversely in a dark, sweet pulp. The ovoid, thick, broad, yellow embryonic seeds are encased in a white endosperm.

Root

The root is reddish-brown. Its exterior is rough and features lenticels arranged horizontally. The inner, light pink bark is easily visible by rubbing off the outer bark. The irregular, yellow-colored porosity of the wood is one of its characteristics.

Stem

The young stem's outer layer is compact, 0.2 inches thick, smooth, greenish to pale grey wood with porosity and off-white colour. The older stem's exterior is rough and dark brown or greyish white.

Wood

Three ways can be used to discuss wood. Timber, heart wood, and sap wood. Timber is used to make agricultural tools and carts because it is brittle, shiny, and small in size. It is capable of splitting. Heartwood exhibits colour variation, ranging from a yellowish red to a brick red to a brownish red hue with darker streaks. Annual rings have a unique appearance. Sap wood has a dirty white colour.

Phytoconstituents of *Cassia fistula*

Extract of this plant contains leinoleic acid, saponin, Citronelol, alloin wax, phenolic compounds, free sugar, free aminoacids, anthroquinone,gum cardiac glycosoids, alkaloids, glycosoids, kemferol, emodinII, iron, galactoman, calcium, phosphate, resins, tannins, steroids, terpenoids, rhein.

Roots

Roots extract of cassia fistula have flavanoids, 3-Ogentiobioside, rhonthocyanadin, Flavan 3-ol derivatives, 7- methylphysicon, betulinic acid and Bsitosterol, rhamnetein. Bark of Root contains oxyanthroquinone and phloba phenes.

Flower

Flower extract of cassia fistula have volatile oil, oxyanthroquinone glycosoids, phenolic compounds, potassium, Anthroquinone, Bsitosterol, B D Glucoside and triterpenes, calcium, iron, , rhein, tannins, manganese. A bianthraquinone, isoflavanoids, glycoside, fistulin together with kaempferol and rhein, proanthocyanadins, catechins tannins, fistulic

acids, anthrones, senosides, alkaloids, Aurantiamide acetate,.

Pulp of flowers, pulp powder and pods

Pulp of flowers, pulp powder and pods extract of cassia fistula having the phytochemicals are rhein, 3, 4, trihydroxy-6 methoxy 5, 3,-7-O-beta-Dgalactopyranosoid-(12)-O-alpha-L-rhamnopyranosy.24- 5-(2-hydroxy phenoxymethyl)furfural, 2′S, and four other new compoundsmethyl 7-hydroxy-5-hydroxyBenzyl-2-hydroxy3,6- dimethoxybenzoate, -2-(2′-hydroxypropyl) chromone, and four additional compounds—two oxy anthroquinon, 5-hydroxy methylfurfural, (2S)7-hydroxy-2-(2-hydroxy propyl)-5-methyl chromone, lysine, glutamic acid, amino acid, steroid, and flavanoids.4. a polar compound that contains sitosterol, triacontane, and 16-hentriacontanol 5- nonatetracontanone, 2-hentriacontanone, tetramer, alloin, leucoppelargonidin tonic, and an oil (likely an isoprenoid unit). Proathocyanadins, phenolic compounds, sennosides, anthrones, L1 (Hexane), sennosides A and B, barbaloin, aloin, formic acid, butyric acid, oxalic acid, ethyl ester, tanin, and pectin are examples of secondary metabolites. In addition, pulp contains water, colouring material, gum, astringent mater gluten, sugar, albuminous starch, and calcium oxalate. Nonatetra contanone, 2- hentriacontanone, Beta-hydroxy-17-norpimar, triacontane, 16-hentriacontanone, and B sitosterol, kempferol, dihydrokaepferol, quercetin derivatives are found in the pods extract. An anthraquinone derivative, 3- formyl-1-hydroxy-8-methoxy-anthraquinone, was isolated. Aspartame, Potassium, calcium, iron, manganese, glutamic acid, aspartic acid, and the amino acid 1,8-dihydroxy-3-anthraquinone carboxylic acid are all found in edible fruit tissue. Epiafzelechin and epicatechin, two proanthocyanidins that contain flavan-3-ol, were found in pods with other common flavan-3-ols and proanthocyanidins like catechin, epicatechin, procyanidin B-2, and epiafzelechin alloin and tonic. Tannins, Terpenoids, flavanoids, steroids alkaloids, and anthroquinone.

Leaves

Volatile oils, steroids, anthroquinone, flavonoids, rhein and triterpenoids, are present in leaves of *cassia fistula*. These include 3-O-B-Dglucopyranoside biflavonoids, aloe-emodin, sennosides, rhein, chrysophanic, and sennosides; (-)-epiafzelechin and two triflavonoids combined with (-)- epiafzelechin, (-)-epicatechin, and procyanidin, Hentriacontanoic, heptacosanoic, nonacosanoic, and triacontanoic acids are present in the cuticular wax of leaves. Limonene, eugenol, camphor, phytol, linalool, and 4-hydroxybenzyl alcohol. 7- Hydroxy-2-(2'- hydroxypropyl)-5-methylchromone, 5-hydroxymethylfurfural, and benzyl 2- hydroxy-3,6- dimethoxybenzoate are also found in *cassia fistula*.

Seeds

Other common compounds found in the seed oil included 3-(6-hydroxy-3,7-dimethyl-octa-2,7- dien yl)-4-methoxy-phenol,5-(4,8-dimethyl nonyl)-5-methyldihydro-2(3H)-furanone, tetra methyl-hexadeca-1,6,10,14-tetraen-3-ol, and 2,5-furandione, 3-dodecenyl. Vernolic, malvalic, stetculic, and cyclopropenoid fatty acids are all

present in the seed oil.3 Seeds are high in glycerides, containing significant amounts of linoleic, oleic, stearic, and palmitic acids as well as trace amounts of myristic, caprylic, and galactomannan carbohydrates. 12 oxy anthroquinone, chrysophanein, and crysophanol.12,18 Napins, a protein with antifungal properties, are found in seeds.

Bark

5, 7, 3', 4'-tetrahydroxy-6, 8-dimethoxyflavone-3-O-α arbinopyranoside and 5, 7, 4'-trihydroxy-6,8,3'-trimethoxyflavone-3-O-α-L-rhamnosyl (1→2) are two flavanol glycosides.A xanthone glycoside and -O-β-D-glucopyranoside, Phlobaphenes, oxyanthraquinone, flavanoids, hexacosanol, B-sitosterol, lupeol, L1 (hexane), L2(CHCL3), L3CHCL3, L4, and tannins are present. α-L-rhamnosyl(1→2), 1,8-dihydroxy-3, 7-dimethoxyxanthone-4-O-O-β- Dglucopyranoside flavanoids, proanthocyanadin, and phenolic compounds.3,24 Twenty-seven substances, comprising three sterols, stigmasterol, βsitosterol, and oleic acid, as well as eight long-chain hydrocarbons, palmitic acid, stearic acid, oleic acid, linoleic acid, heptacosyl eicosanate, and glyceryl-1-tetraeicosanoate; From the bark, the following compounds were isolated and identified: β-sitosteryl-3-O-Dglucopyranoside, one triterpene, lupeol; eight anthraquinones, chrysophanol, emodin, physcion, citreorosein, rhein, rhein methyl ester, ziganein; 1,4,5-trihydroxyanthraquinone; two coumarins, isoscopoletin, scopoletin; three aromatic compounds, isovanillic acid, vanillic acid, and 2,4-dihydroxybenzaldehyde; and two chromones, 2,5-dimethyl-7-hydroxychromone, 2,5-dimethyl-7-methoxychromone.

Flower pollens

Methionine, glutamic acid, phenylalanine, and proline, lipid, free amino acid and carbohydrate were observed.

Medicinal Studies:

1. **Anthelmintic Activity** Irshad M et al.,(2010) had studied the Anthelmintic Activity of C.fistula fruit pulp and seeds extracts. To test this activity, Pheretima postnuma worms are used, and both extracts exhibit a significant effect at a concentration of 100 mg/ml. As a reference medication, piperazine citrate is taken at a dosage of 10 mg/ml. The paralysis and worm death caused by pulp and seeds had correlation coefficients of 0.9976 and 0.9986, respectively.
2. **Antibacterial Activity** Yadav RN et al., (2003) isolated compound which showed antimicrobial activity against Escherichia coli, Bacillus subtilis, Staphylococcus aureus, Klebsiella pneumoniae, Aspergillusniger and Fusarium oxysporum. Ali MA et al., (2004) reported that the antibacterial and antifungal activities of C. fistula and M.ferrea extracts were tested on 14 bacteria and 6 fungi. C. fistula extracts showed stronger antibacterial activity than M. ferrea. Vimalraj TR et al., (2009) studied the antibacterial activity of the aqueous and alcoholic extract of stem bark of C. fistula. Using the disc diffusion method, an aqueous extract of C. fistula demonstrated

significant activity against S. aureus but not against the other tested bacteria. When compared to aqueous extract, alcoholic extract exhibited higher inhibition against S. aureus. An S. aureus field isolate that was resistant to chloramphenicol could also be affected by the alcoholic extract derived from C. fistula. The alcoholic and aqueous extracts' respective zones of inhibition ranged from 7.0 to 12.0 and 7.0 to 11.6 mm. The alcoholic extracts' minimum inhibitory concentrations (MICs) against S. aureus ranged from 0.78 to 6.25 mg/ml.

3. **Antifertility activity** Rajesh Yadav et al., (2009) investigated that petroleum ether extract of seeds of Cassia fistula was screened for the antifertility activity in proven fertile female albino rats at the doses 100, 200 and 500 mg/kg b.wt./day. Laparotomy on day 15 of pregnancy confirmed that oral administration of the extract to mated female rats on days 1–5 of pregnancy led to a dose-dependent decline in the fertility index, number of uterine implants, and live foetuses. When tested in immature bilaterally ovariectomized female albino rats, the extract (100 mg/kg b.wt.) showed weak estrogenic activity; however, when administered in combination with estradiol valerate (0.1 mg/kg b.wt.), it showed slight antiestrogenic activity. Haematological parameters and blood sugar levels were within normal limits. Because of its anti-implantation activity, the petroleum ether extract of Cassia fistula seeds has the potential to terminate pregnancies, according to the study's findings.
4. **Antifungal activity** Padma Singh et al., (2006) tested the leaf extract of Cassia fistula for antifungal activity against Candida albicans. The leaves of Cassia fistula were extracted using methanol, diethyl ether, and acetone. The paper disc diffusion assay was used to measure the antifungal activity. The maximum activity was demonstrated by the methanol extract, up to 21 mm, which was comparable to the antifungal antibiotic clotrimazole.

   Duraipandiyan V et al., (2007) evaluated the hexane, chloroform, ethyl acetate, methanol and water extracts from the flower of Cassia fistula were tested against bacteria and fungi. For Gram-positive organisms, all of the extracts demonstrated antibacterial activity with minimum inhibitory concentrations (MIC) ranging from 0.078 to 2.5 mg/ml. Pseudomonas aeruginosa was the only Gram-negative bacteria that showed susceptibility to the extracts. Chromatographic methods were used to fractionate the crude extract of ethyl acetate. Through the use of X-ray crystallography, the identity of the isolated crystal—4-hydroxy benzoic acid hydrate—was established. Against Trichophyton mentagrophytes (MIC 0.5 mg/ml) and Epidermophyton floccosum (MIC 0.5 mg/ml), it demonstrated antifungal activity.
5. **Anti-inflammatory and Antioxidant activities Rasdeep Kour et.al 2023** The traditional medicinal uses of Cassia fistula L. as an anti-inflammatory, hepatoprotective,

antifungal, antibacterial, antimutagenic, and wound healing agent are well known. The current study set out to ascertain the cytotoxic, genoprotective, and antioxidant potential of several C. fistula bark fractions, including methanol (CaMM), hexane (CaMH), chloroform (CaMC), and ethyl acetate (CaME). CaMM demonstrated the highest level of radical scavenging activity among all the fractions examined in the antioxidant DPPH assay. The IC50 values for the superoxide anion radical scavenging assay and the nitric oxide radical scavenging assay were 18.95, 29.41, and 13.38 µg/ml, respectively. The highest concentration of flavonoids (36.96 mg rutin equivalent/g dry weight of fraction) and phenolics (130.37 mg gallic acid equivalent/g dry weight of extract) was found in the CaMM fraction.

6. **Nayan R.Bhalodia et.al 2011** has been assessed by *In vitro* method Antioxidant activity for phytochemical fraction of plant, viz hydro alcohol extract of *Cassia fistula* seeds. The present study was aimed to investigate the antioxidant activity of extracts of dried seed powder of *Cassia fistula* Linn.

   Raju Ilavarasan et al., (2005) reported that Anti-inflammatory and Antioxidant activities of the aqueous (CFA) and methanolic extracts (CFM) of the C. fistula bark were assayed in wistar albino rats. It was discovered that the extracts had a strong anti-inflammatory effect in both acute and chronic models. In rat liver and kidney homogenates, Cassia fistula bark extracts significantly inhibited lipid peroxidation that was started by CCl 4 and FeSO 4. In invitro assay methods induced by DPPH, nitric oxide, and hydroxyl radicals, both extracts demonstrated noteworthy antioxidant activity. In liver and kidney homogenates, both extracts demonstrated a dose-dependent protective effect against lipid peroxidation and the production of free radicals. Therefore, it can be said that the bark extracts from Cassia fistula (CFA & CFM) have strong anti-inflammatory and antioxidant qualities.

   Siddhuraju P et al., (2002) investigated 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 positively correlated with the total polyphenolic content of the extracts and decreased with stem bark, leaves, flowers, and pulp. The presence of prooxidants like reducing sugars and chrysophanol, which outweigh the antioxidant compounds in the extracts, may be the cause of the low antioxidant activity in the flower and pulp fractions. As a result, the stem bark exhibited higher antioxidant activity in terms of its capacity to reduce, inhibit peroxidation, and scavenge O2 and DPPH radicals.

   Manonmani G et al., (2005) reported that aqueous extract of Cassia fistula (Linn.) flowers (ACF) was screened for its antioxidant effect in alloxan induced diabetic rats. In the heart tissues of diabetic rats treated with ACF, there was a noticeable decrease in peroxidation

products, such as conjugated dienes, hydroperoxides, and reactive substances containing thiobarbituric acid. After receiving ACF treatment, the reduced activities of important antioxidant enzymes in diabetic rats, including glutathione reductase, superoxide dismutase, catalase, and glutathione peroxidase, returned to a nearly normal range. These findings imply that ACF exhibits encouraging antioxidative activity in rats with alloxan- induced diabetes.

7. **Anti-leishmaniatic activity** Sartorelli P et al., (2007) examined that the hexane extract from the fruits showed significant antileishmanial activity against the promastigote form of Leishmania L.chagasi. A sterol called clerosterol was isolated via bioguided fractionation and subsequently examined in various models. Intracellular amastigotes showed high susceptibility, with an IC50 of 18.10µg/mL, while promastigotes showed an inhibitory concentration 50% (IC50) of 10.03µg/mL. When the cytotoxicity of clerosterol on mammals was assessed, it was found to be 3.6 times less toxic than pentamidine, the standard drug.
8. **Antimicrobial Activity** Aneja et al., (2011) had studied the evaluation of antimicrobial potential of Cassia fistula flowers, leaves and bark extracts against Staphylococcus aureus, Pathogens that cause otitis externa include Proteus mirabilis, Escherchia coli, Pseudomonas aeruginosa, Acinetobacter sp., and Candida albicans. These pathogens are compared with ear drops that are readily available locally. While leaf extract demonstrated activity against four tested bacteria and aqueous extracts were unable to demonstrate any antimicrobial activity, organic flower and bark extracts demonstrated activity against all tested ear pathogens. Acetonic flower extract, followed by bark extract and leaf extract, was found to be the most effective organic solvent against S. aureus out of the three that were tested. With a minimum inhibitory concentration (MIC) of 6.25 mg/ml, the herbal ear drops demonstrated smaller inhibition zones than the acetonic flower extract.
9. **Antiparasitic activity** Sartorelli P et al., (2009) discovered that 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, determined using spectroscopic techniques. The 50% effective concentration (EC50) value of this compound against Leishmania (L.) chagasi promastigotes was 18.96µg/mL. This substance's EC50 value against peritoneal macrophages indicated that it was cytotoxic. It was 42.58µg/mL. Biochanin A also demonstrated anti-Trypanosoma-cruzi activity, with an EC50 value of 18.32µg/mL and 2.4 times greater efficacy than benznidazole.
10. **Antipyretic activity** Bhakta T et al., (2001) examined the methanol extract of buds of C. fistula for its antipyretic action on normal body

temperature and yeast-induced pyrexia (fever) in rats. In both models, the extract exhibited noteworthy efficacy at 200 and 400 mg/kg. Up to three hours after administration, the extract significantly lowered the average body temperature at a dose level of 200 mg/kg. It significantly lowered body temperature up to six hours after administration at a dose of 400 mg/kg. The extract demonstrated dose-dependent reduction of body temperature up to 4 hours at both dosage levels in the model of yeast-provoked elevation of body temperature. The outcomes are similar to those of the common antipyretic drug, paracetamol.

11. **Antitumor activity** Vasudevan K et al., (2008) investigated the chemopreventive efficacy of Cassia fistula bark extracts in 7, 12-dimethyl benz(a)anthracene (DMBA) induced hamster buccal pouch carcinogenesis. Oral administration of Cassia fistula bark extract to DMBA painted animals completely prevented the formation of oral squamous cell carcinoma. In DMBA-painted animals, the bark extract also improved the levels of antioxidants, detoxification enzymes, and byproducts of lipid peroxidation. These findings imply that the bark extract from Cassia fistula has a significant chemopreventive effect during the DMBA-induced oral carcinogenesis. This is most likely because the extract contains one or more strong anticarcinogenic principles that work in concert with one another to prevent oral cancer. Cassia fistula's antilipid peroxidative, antioxidative, and detoxification agent modulation during DMBA-induced oral carcinogenesis may also contribute to its chemopreventive potential.

    Gupta M et al., (2000) studied the 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. In the EAC tumour hosts, ME treatment resulted in longer life spans as well as smaller tumour volumes and fewer viable tumour cells. Studies on the treated tumour cells' cytology have shown a decrease in mitotic activity as well as the emergence of intracytoplasmic vacuoles and membrane blebbing. Following ME treatment, improvements have also been seen in the haematological parameters, such as the tumor-bearing mice's bone marrow cell count, red blood cell count, and haemoglobin content. The current study's findings imply that the ME of C. fistula seed has antitumor properties.

12. **Clastogenic effect** Mukhopadhyay MJ et al., (1998) Anthraquinone glycosides of Cassia fistula were investigated for their ability to induce a clastogenic effect on the bone marrow cells of Swiss albino mice. Chromosome aberrations and the frequency of aberrant cells were the endpoints that were screened for. There was no discernible increase in the number of chromosomal abnormalities or aberrant cells following oral administration of these anthraquinones at doses comparable to those found in leaf and pod extracts. The findings suggest that rhein and anthraquinone

sennoside B have weak genotoxicity. Rhein and pure sennoside B had weak clastogenic properties. Weak clastogens were also found in crude extracts of C. fistula (leaves and pods), which each contained sennoside B and rhein. Compared to the levels induced by the same concentration of pure sennoside B, the CA/cell and % DC were lower. Pods or leaves of C. fistula can be used as an alternate source of sennosides because these phytolaxatives do not act as strong clastogens.

13. **CNS activities** Mazumder UK et al., (1998) showed that the methanol extract of seeds ofC. Fistula was tested for different pharmacological actions in mice. The sedative effects of diazepam, meprobamate, sodium pentobarbitone, and chlorpromazine were all markedly enhanced by the extract. In a dose-dependent manner, it also increased the analgesia brought on by pethidine and morphine. Mice's behavior was also affected by the extract.

Conclusion:

Ayurveda, Siddha, Unani, homoeopathy, and other traditional systems aid in the thorough examination and research of medicinal herbs. Cassia fistula is a significant herb in medicine. This flowering plant, also referred to as Amaltas, is a member of the Leguminosae family. The current paper is a recent review of C. fistula's pharmacognostical research and traditional uses. Nearly every part of A Cassia fistula is rich in phytochemicals, and it has been observed to exhibit a variety of activity, Laxative activity, Leukotriene inhibition activity, Sedative effect and Anti-anxiety effect and Wound healing activity. Since nontoxic plant products are increasingly being used in traditional medicine across the globe, it is important to focus on developing modern drugs derived from C. fistula in order to control a variety of diseases. Hence, the active principles needs to be isolated and can formulate to treat various ailments by performing clinical trial studies to understand the molecular mechanism of action, in search of lead molecules from natural resources.

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Cite this article Garg R *et al,* Pharmacological and Pharmacognostical Studies of Cassia Fistula Linn. Indian Journal of Health Care, Medical & Pharmacy Practice.2023; 4(2) 107-118.