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Review Article

A REVIEW ON CASSIA FISTULA

Sanjay Singh Bhandari \*<sup>1</sup>, Kunal Khurana<sup>1</sup>, Ankur Balyan<sup>1</sup>, Mahaveer Prasad Kabra<sup>2</sup>,  
Kapil Negi<sup>3</sup>

<sup>1</sup>Department of Pharmacology, M.D.U. Rohtak, Haryana

<sup>1</sup>Department of Pharmacology, Kota College of Pharmacy, Kota (Raj.)

<sup>2</sup>Department of Pharmacology, UTU, Dehradun, Uttarakhand

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ABSTRACT

*Cassia fistula* (Fabaceae–Pea family) has traditional medicinal value eg. used in cooling, purgative, anthelmintic, emetic, diuretic, depurative, skin diseases, burning sensation, dry cough and bronchitis etc. the various plants parts such as roots, flower, seeds are used to solve above purpose. The chemical constituents, kaempferol, rhein, bianthroquinone glycoside, alkaloids, gkutin, pectin, calcium, oxalates, flovefin and anthraquinone obtained from the different parts of the plant. Hepatoprotective, antioxidant, hypoglycemic, antibacterial, anti-inflammatory activity was reported for *Cassia fistula*.

**KEY WORDS:** *Cassia fistula*, Traditional medicinal, Glycoside, Antibacterial

INTRODUCTION

**C***assia fistula* (Fabaceae–Pea family) has traditional medicinal value eg. used in cooling, purgative, anthelmintic, emetic, diuretic, depurative, skin diseases, burning sensation, dry cough and bronchitis etc. the various plants parts such as roots, flower, seeds are used to solve above purpose. The chemical constituents, kaempferol, rhein, bianthroquinone glycoside, alkaloids, gkutin, pectin, calcium, oxalates, flovefin and anthraquinone obtained from the different parts of the plant. The reported activity hepatoprotective, antioxidant, Hypoglycemic, antibacterial, of *Cassia fistula* showed good medical profile.

**Biological Description:**

The new leaves normally appear during March–July in India. The flowers appear mainly from April to July, although some trees flower as late as October, especially during dry years. The long cylindrical pods develop rapidly and reach their full length by October and they ripen during December–March. The ripe pods start falling during May.

**Botanical Description:**

*Cassia fistula* is a medium sized deciduous tree, 10 m tall with a straight trunk to 5 m, 1 m diameter and spreading branches. Stem bark pale grey, smooth and slender when young and dark brown and rough when old. Leaves alternate, pinnate, 30–40 cm long, with 4–8 pairs of ovate leaflets, 7.5–15 cm long, 2–5 cm broad, entire, the petiolules 2–6 mm long. Flowers bright yellow in terminal, drooping racemes, 30–60 cm long; calyx oblong, obtuse, pubescent; corolla with five subequal, obovate, shortly clawed petals, to 3.5 cm across;

\* For Correspondence:  
Sanjay Singh Bhandari  
Department of Pharmacology,  
M.D.U. Rohtak, Haryana  
E-mail: bhandarisanjay001@gmail.com  
Mob. No: 09672625112

stamens 10, upper three with erect filaments. [1]

**Chemical Constituents:**

Amaltas seed contains 24 % proteins, 51 % carbohydrates and about 4.5 % fats. Flowers contain various organic substances like ceryl alcohol, kaempferol, rhein and bianthroquinone glycoside. Leaves possess organics like rhein, rheinglucoside and

sennoside. The fruit pulp contains anthraquinone, glucose 60%, alkaloids, gkutin, pectin, calcium, oxalates, certain acids and water. Stem bark contains lupeol, beta sitosterol and hexacosanol. It also contains tannins which are about 10 to 20 %. Besides all these the root bark contains flovefin and anthraquinone. Leaves and flowers have glycosides. [1]

**Plant Profile:**

**Taxonomy:-**

Kingdom	<u>Plantae</u> – Plants
Subkingdom	<u>Tracheobionta</u> – Vascular plants
Superdivision	<u>Spermatophyta</u> – Seed plants
Division	<u>Magnoliophyta</u> – Flowering plants
Class	<u>Magnoliopsida</u> – Dicotyledons
Subclass	<u>Rosidae</u>
Order	<u>Fabales</u>
Family	<u>Fabaceae</u> – Pea family
Genus	<u>Cassia L.</u> – cassia P
Species	<u>Cassia fistula L.</u> – golden shower



*Cassia fistula*

**Botanical Name :** *Cassia fistula*  
**Classical Names :**  
**Sanskrit :** Araghvadh  
**English :** Purging cassia, Goldan Shower Tree  
**Indian :** Amaltas  
**Plant Parts Used :** Leaves & Fruits

#### **Medicinal Uses:**

- [Roots are astringent, cooling, purgative, febrifuge and tonic. it is useful in skin diseases, burning sensations and syphilis.
- Bark is laxative, anthelmintic, emetic, febrifuge, diuretic and depurative. It is useful in boils, leprosy, ringworm affection, colic, dyspepsia, constipation, diabetes, strangury and cardiac problems. Leaves are laxative, antiperiodic and depurative.
- It is useful in skin diseases, burning sensation, dry cough and bronchitis. Fruits are sweet, cooling, purgative, carminative, anti-inflammatory, diuretic and ophthalmic. It is used in flatulence, colic, dysentery, inflammations and intermittent fever.
- It is also used in cardiac disorders, strangury, ophthalmopathy and general debility. Pulp from fruits called "Cassia Pulp" is a well known Laxative. Bark of tree is rich in tannins. Flowers are bitter, acrid, cooling, emollient, purgative and are useful in vitiated condition of pitta, burning sensation, leprosy and skin diseases. It is also useful in cardiac disorders, intermittent fever and general debility.

#### **REPORTED ACTIVITIES**

Kumar et al. carried out a study to determine the antioxidant activity of selected medicinal plants namely *Albizia amara*, *Achyranthes aspera*, *Cassia fistula*, *Cassia auriculata* and *Datura stramonium* by inhibition of lipid peroxidation technique. The highest inhibition of lipid peroxidation activity was observed in *A. amara* (96%) followed by *C. fistula* (89%) and *C. auriculata* (89%). The potency of protective effect of *A. amara* was about 4 times greater than the synthetic antioxidant butylated hydroxyl toluene (BHT). The total

alkaloid content varied from  $24.6 \pm 0.18$  to  $72.6 \pm 2$  mg g<sup>-1</sup> in the extracts. Flavanoid contents were between  $23.15 \pm 0.2$  and  $63.3 \pm 0.6$  mg g<sup>-1</sup> in the methanolic extracts of these plants. Our study indicates that the antioxidant activity of *A. amara* could be harnessed as a drug formulation. [2]

Gupta et al. studied the effect of 50% ethanolic extract of *Cassia fistula* Linn. (Family: fabaceae) legume was assessed on serum lipid metabolism in cholesterol fed rats. Oral feeding of cholesterol (500 mg/kg b.wt./day) dissolved in coconut oil (0.5 ml/rat/day) for 90 days caused a significant ( $P < 0.001$ ) elevation in total and LDL-cholesterol, triglycerides and phospholipid in serum of rats. [3]

Pradeep et al. studied hepatoprotective and antioxidant effect of *Cassia fistula* Linn. leaf extract on liver injury induced by diethylnitrosamine (DEN). Wistar rats weighing  $200 \pm 10$  g were administered a single dose of DEN (200 mg/kg b.w., i.p.) and left for 30 days. For hepatoprotective studies, ethanolic leaf extract (ELE) of *C. fistula* Linn. (500 mg/kg p.o.) was administered daily for 30 days. [4]

Bhakta et al. Hepatoprotective activity of the n-heptane extract of *Cassia fistula* leaves was investigated in rats by inducing hepatotoxicity with carbon tetrachloride:liquid paraffin (1:1). The extract has been shown to possess significant protective effect by lowering the serum levels of transaminases (SGOT and SGPT), bilirubin and alkaline phosphatase (ALP). [5]

Bhakta et al. studied Hypoglycemic activity of *Cassia fistula* Linn. by using leaf (Methanol

extract) in alloxan-induced diabetic rats. [6]

Bahorun et al. observed Polyphenolics abundantly present in both in vivo and in vitro extracts may prove to be very important, non-toxic chemopreventive agents against various oxidative stresses. [7]

Luximon et al. *Cassia fistula* harvested at different stages of growth were determined using the Trolox equivalent antioxidant capacity (TEAC) and ferric-reducing antioxidant power (FRAP) assays. The antioxidant activities were strongly correlated with total phenols (TEAC  $r = 0.989$ ; FRAP  $r = 0.951$ ) in all organs studied, and with proanthocyanidins (TEAC  $r = 0.980$ ; FRAP  $r = 0.899$ ) in reproductive organs including fruits. [8]

Vimalraj et al. evaluate antibacterial activity aqueous and alcoholic extract of stem bark of *Cassia fistula*. The bacterial isolates tested include: *Staphylococcus aureus* (MTCC 740), *Bacillus subtilis* (MTCC 441), *Escherichia coli* (MTCC 443) and a few field isolates of *Staphylococcus aureus*, *Bacillus anthracis*, *Escherichia coli*, *Pasteurella multocida*, and *Salmonella typhi*. Disc diffusion and Minimum Inhibitory Concentration (MIC) studies were carried out to assess the antibacterial effect. [9]

Raju Ilavarasan et al. observed Anti-inflammatory and Antioxidant activities of the aqueous (CFA) and methanolic extracts (CFM) of the *Cassia fistula* Linn. bark assayed in wistar albino rats. The extracts were found to possess significant anti-inflammatory effect in both acute and chronic models. Both extracts exhibited significant antioxidant activity in DPPH, Nitric oxide and Hydroxyl radical induced invitro assay methods. [10]

Bhakta et al. evaluate hepatoprotective activity of the n-heptane extract of *Cassia fistula* leaves was investigated in rats by inducing hepatotoxicity with carbon tetrachloride:liquid paraffin. [11, 12]

Singh et al. Wound healing activity of the leaf extracts deoxyelephantopin isolated from *Elephantopus scaber* Linn. [13]

Shivananda et al. evaluation of the Wound-

healing Activity of Ethanolic Extract of *Morinda citrifolia* L. Leaf. [14]

Shivananda et al. evaluate wound healing activity of *Allamanda cathartica*. L. and *Laurus nobilis*. L. extracts on rats. [15]

Ghosh et al. Screened ethanolic (50% v/v) extract of the leaves of *Tagetes erecta* Linn. (Family – Asteraceae) was screened for wound-healing activity on adult albino rats by Excision wound model and Incision wound model respectively. The studies on excision wound model revealed significant wound healing activity of the extract, which is comparable with the reference control nitrofurazone. In the incision model, the tensile strength of the extract treated group is found to be highly significant ( $p < 0.001$ ) on 12th post wounding day when compared with controls. [16]

Dubey et. al. Adult male rabbits injected with alloxan (50 mg/kg i.p.) were divided into two groups of nine each. One group received placebo and the other group an aqueous suspension of D-400, at the dose of 1 gm/kg body weight orally daily for 36 weeks. Blood glucose, blood urea and serum creatinine were estimated initially and at every 6-weekly intervals. At the end of 36 weeks D-400 significantly prevented the rise in blood urea and serum creatinine levels as compared to the control. Although a rise in blood sugar was noticed in both the groups, the level of blood sugar after 36 weeks was significantly lower in the D-400 treated group. [17]

Vetrivel et al. studied is to determine the hepatoprotective effects of *Cassia tora* against carbon tetra chloride induced liver damage in albino rats. The efficacy of the treatment was estimated by the serum level marker enzymes: serum glutamatic oxaloacetic transaminase, serum glutamate pyruvate transaminase and lactate dehydrogenase. The treatment also included the estimation of enzymatic antioxidants: superoxide dismutase, glutathione peroxidase, glutathione-S transferase and catalase; non-enzymatic antioxidants: vitamin C and vitamin E. The results of this study revealed the remarkable increase of marker enzymes in induced rats and decreased level in cassia torra treated

ones. Furthermore, the level of enzymatic and non-enzymatic antioxidant level were elevated in treated rats compared to induced ones. [18]

## CONCLUSION

The reported activity hepatoprotective, antioxidant, Hypoglycemic, antibacterial, of *Cassia fistula* showed good medical profile. The further research on this plant may help to find out new medicinal activity.

## REFERENCES:

1. <http://ida.lib.uidaho.edu:2104/science>.
2. Kumar S, Sucheta V, Sudarshana DP, Latha S. Antioxidant activity in some selected Indian medicinal Plant. *African Journal of Biotechnology*. 2008(12);1826-1828.
3. Gupta M, Mazumder UK, Rath N, Mukhopadhyay DK. Activity of ethanolic extract of *Cassia fistula* L. seed against Ehrlich Ascites Carcinoma. *J. Ethnopharmacol*, 2000;(72): 151.
4. Kannampalli RM, Kuppannan SK. Effect of *Cassia fistula* Linn. leaf extract on diethylnitrosamine induced hepatic injury in rats. *J. Ethnopharmacol*. 2006; 177-179.
5. Bhakta T, Banerjee S, Mandal SD, Mait TK, Saha BP, Pal M. Hepatoprotective activity of *Cassia fistula* leaf extract. *Phytomedicine*. 2001; (8): 220–224.
6. Bhakta T, Mukherjee PK, Saha K, Pal M, Saha BP. Hypoglycemic activity of *Cassia fistula* Linn. (*Leguminosae*) leaf (Methanolextract) in alloxan-induced diabetic rats. *J. Ethnobot*. 1997;(9) :35.
7. Theeshan BVS, Neergheen OI. Phytochemical constituents of *Cassia fistula*. *African Journal of Biotechnology*. 2005; (13):1530-1540.
8. Luximon RA, Bahorun T, Soobrattee MA, Aruoma OI. Antioxidant activities of phenolic, proanthocyanidin, and flavonoid components in extracts of *Cassia fistula*. *Phytomedicine*. 1999; (3):122-123.
9. Ranjith T, Vimalraj PK, Pal M, Saha BP. Antibacterial effect of *Cassia fistula* extract on pathogenic bacteria of veterinary importance. *Tamilnadu J. Veterinary & Animal Sciences*. 2009; (3): 109-113.
10. Raju SV. Antioxidant activity of *Cassia fistula* leaf extract. *Journal of Ethnobotany*. 1999;(1):198-200
11. Muthusamy SK, Ramasamy S, Harinarayanan V, Raghavan KP. Wound healing potential of *Cassia fistula* on infected albino rat model. *American Journal of Clinical Pathology*. 2005;(2) :13.
12. Bhakta T, Pulok K, Mukherjee K, Mukherjee S, Banerjee SC, Mandal TK, Maity M, Saha BP. Evaluation of hepatoprotective activity of *Cassia fistula* leaf Extract. *Phytomedicine*. 1998; 22 -25.
13. Singh SDJ, Krishna V, Mankani BK, Manjunatha SM, Vidya YN. Wound healing activity of the leaf extracts and deoxyelephantopin isolated from *Elephantopus scaber* Linn. *Indian J pharmacol*. 2005;(37):238 – 242.
14. Shivananda B, Nayak S, Sandiford AM. Evaluation of the Wound-healing activity of ethanolic extract of *Morinda citrifolia*. *Oxford Journal*. 2007; (6):351 - 356.
15. Nayak S, Poorna N, Steve S, Vidyasagar AA. Evaluation of wound healing activity of *Allamanda cathartica*. L. and *Laurus nobilis*. L. extracts on rats. *Complementary and Alternative Medicine*. 2006; (6):12–17.
16. Ghosh TA, Bose GK, Dash TK. Wound healing activity of *Tagetes erecta* Linn. leaves. *Pharmainfo.net*. 2004; (2):14 – 19.
17. Dubey GP, Dixit SP, Singh A. Alloxan-induced Diabetes in rabbits and effect of a herbal formulation D-400. *Indian Journal of Pharmacology*. 1994; (26): 225-226.
18. Vetrivel AV, Shanmugavali N, Sunitha CG. Hepatoprotective effect of *Cassia tora* on  $CCl_4$  induced liver damage in albino rats. *Indian journal of Science and Technology*. 2009(2):41-44.

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