International Journal of Pharmaceutical Research and Applications
Volume 6, Issue 4 July-Aug 2021, pp: 631-634 www.ijprajournal.com ISSN: 2249-7781

Cassia Tora Linn: Importance and Properties: A Review

Navneet Kumar Verma*, Asheesh Kumar Singh, Amit Kumar Chaurasiya
Buddha Institute of Pharmacy, GIDA, Gorakhpur, UP, India

Date of Submission: 15-07-2021 Date of Acceptance: 30-07-2021

ABSTRACT
Cassia tora Linn. Leguminosae is an annual herbaceous fetid herb which is mostly found in South East Asia and the South West Pacific as an important weed. It is one of the recognized anthraquinone (organic compound) containing plants. Later on there were many sages who prominently worked for Ayurveda such as Athar Vangirasa, Atharveda, Atreya, Agnivasa, Bhila, Jatukarna, Parasana, Harita, Susruta, Charak etc. Besides Ayurveda other traditional system of medicine in India like Siddha, Yoga & nature cure came into existence but ,Ayurveda is the oldest of them all. During the British rule, it was declined to unprecedented level. However, the development of Indian system of medicine has gained considerable attention after the independence. A survey conductedbyWHO indicates that 80% of about 4 billion population in developing countries relied upon the use of traditional medicines, which are mainly derived from the plant material. As per WHO 70% of world's population is dependent on traditionally found medicines for fighting with their health issues as well as disease. Species cassia belongs to one such plant that possesses very wide active constituents. The plant is traditionally well known for the treatment of conditions like hypertension, diabetes, skin disease, cough, pulmonary problems, and stomach problem etc.Interestlingly the genus cassia consists of 580 species of trees, herbs and shrubs.

Keywords: Cassia tora Linn, Leguminosae, herbaceous.

I. INTRODUCTION

Common Name of the Plant

In Hindi chakavat, chakunda,panevar, in Marathi Takla, tankli,tarota; in Bengali Panevar, chakunda; in Tamil tagarai, senavu, vindu;in Rajasthani Chakuada, panwar, pumaria; in Gujarati Kawario, konariya; in Sanskrit chakramarda, dadamari, prishnaparni,tellakasinda; in Jammu haedma; in Madhya Pradesh carota,halbi; in Punjab chakunda, panwar, pawas; in Tripura chakunda,goel-eski in Oriya chakunda. It is also known commonly as sickle Senna due to sickle shape of the plant fruit**.(**Wlth India-Raw materials,II,98;F1 Br Ind,II,263;Kirtikar & Basu,Pl.353.)

Botanical Features

C.tora is a stout, erect, smooth semi woody annual herb one-two meter in height. Leaves 6.0-12.5 cm long,leaflets 3 in pairs, 3-5 cm long, membranous, ovate-oblong, with subulate glands in the last two pairs, showing sleepy movementsat night; The flowersarebright yellowin colors, usually in pairs, on very short axillary peduncles; pods stout 4-angle, 15-25 cm long; seeds green,25-30**.(**Cooke T.,Bot Surv India,1967,447**)**

Occurrence

The plant occurs as a weed spreading up to an altitude of 1450 m in Himalaya regions. Found distributed wildly in UP, Bihar, Rajasthan, Orissa, Maharashtra, Bengal, Punjab and plains of Tamil nadu**.** (Sharma P C et al,Data. Med Plants Ayurveda & Siddha,vol 2,2005,144-188)

Useful Portions of the Plant

Rootlet, Leaflets and Seeds**.** (Acta bot Indica, 1977, 5, suppl., 29)

Spreading & Planting

The plant can be easily cultivatedgrown by means of seeds. (Babbar et al, J med Res, 1982, 76, suppl.,54)

C.tora with flowering twigs and C.tora seeds

Cassia Tora – Seed (Description)

Macroscopical Peculiarities

Color-light brown
Odour-odourless
Taste-bitter
Size-length 3-6 mm
Thickness 2-4 mm
Shape-elongated, ovoid and obliquely pointed
Texture-smooth

Microscopical Aspects (Raghunathan K et al1982,199-213)

Testa:

[A] Outer integument:

Epidermis: single layered, polygonal tubular cells

International Journal of Pharmaceutical Research and Applications
Volume 6, Issue 4 July-Aug 2021, pp: 631-634 www.ijprajournal.com ISSN: 2249-7781

Sub-epidermis: one or two layers of cylindrical collenchyma

[B] Inner integument:

Sclerenchymatous layer-elongated longitudally, sclerieds are lignified; 110-180µ long and 13-16 µ wide, walls are thick with small lumen

Parenchymatous layer-1-2 layered, elongated tangentially.

Pigment layer-single layered, polygonal cells, red brown pigments.

Endosperm-cells are polyhedral, oily globules and aleuronic granules.

Cotyledon-cells are polyhedral.

Seed Powder

Organoleptic qualities

Color-brown

Odor- odorless

Taste-bitter.

Figure.1; Cassia Tora leaves

Phytochemistry

Various authors have reported that different part of the plant contains different constituents. The leaves of the plant contains Emodin, tricontain-1-ol, stigmasterol, β-sitosterol-β-D-glucoside, succinic acid, tartaric acid, uridine, quercetin, isoquercitin (Keneda M et al**,** Chem Pharm Bull,1969;17(3):458-461).Also leaves & seeds contains anthraquinones as chrysophanol, physcion, emodin, rhein, obtusifolin, obtusin, chyrso-obtusin, rubrofusarin, aurantio-obtusin, chysophanic acid-9-anthrone. From seed extract phenolic glycoside like triglucoside, nor-rubrofusarin, gentiobioside torachysone, toralactone (Meena AK et al,2010), and alaterinin have been isolated(Shibata S et al,Chem Pharm Bull,1969;17(3):454-457). The butanol soluble extract of the seeds of the plant contains three naphthopyrone glucosides-cassia side, rubrofusarin-6-o-β—gentiobioside and toralactone-9-o-β-D-gentiobioside (Choi JS et al,Arch Pharm Res.1994;17(6):462-466)**.**Seed extract have also demonstrated the presence of anthraquinones derivative like 1-desmethylaurantio-obtusin and 1-desmethylchryso-obtusin(Zhu L et al Sep purify Technol.,2008;63(3):665-669).The gum extracted from the seeds of cassia tora contains 70% high m.wt. Polysaccharide with a liner chain of 1, 4-β-D-mannopyarnose linked to 1,6-linked α-D-galactopyranose unit. The composition of saccharide were mannose (78-79%),galactose(16-17%) and glucose(7.5-8%)(Hallagan JB et al,Food Chem Toxicolo. 1997;35(6):625-632).Cassia tora leaves were also evaluated to find out proximate nutrient content, amino acid composition, and some special mineral element. Result showed the presence of 11.25% of crude protein,28.00% of crude fibre protein.17 amino acids were also found to be present in extract The various element were Ca 3.45 gm,Fe 0.25 gm,Na 0.11 gm,Mg o.85 gm,Na 0.03 gm,Mn 0.11 gm,Co 0.01 gm,K o.75 gm,etc (Kubmarawa D et al,Int Res J Biochem & Bioinform. 2011;1(9):222-225).

Medicinal Uses of C.tora

Antifungal and Antibacterial activity

Different studies have suggested that the plant has antifungal activity. The chief antifungal component identified were**(was)** Chrysophanic acid-9- anthrone.The compound has prevented the growth of Trichophyton rubrum, T.mentagrophytes, Microsporum canis, M.gypseum, and Geotrichum candidum in broth culture in presence of an antioxidant L-Ascorbic acid at 95.5 µg/ml (Rejiya CS, et al.,2009, 23 (6), 1034-1038).In one study ethanolic extract of plant seed showed inhibition of the growth of c.albicans with inhibition zone of 8.5 mm diameter at 24 mg/ml and 11.0 mm diameter at 29 mg/ml (Acharya TK et al., 1975, 38 (3), 218-220). Ethanolic and aqueous extract from the leaves of c.tora had been observed for the antibacterial activity in zone of inhibition at 0.15 mg and 0.30 mg doses respectively. The extract showed pronounced antibacterial activity when compared with the standard reference drug ciprofloxacin (Panda NP et al., 2012, 3 (1), 175-179).

Hepatoprotective and Antihyeprlipidemic activity

In an experimental study, carbon tetrachloride induced liver damage in albino rats was**(were)** decreased by orally administered leaf extract at dose of 100-600 mg/kg body weight. Study showed that the extract has raised the level of SGPT, SGOT, ALP, and the production of

International Journal of Pharmaceutical Research and Applications
Volume 6, Issue 4 July-Aug 2021, pp: 631-634 www.ijprajournal.com ISSN: 2249-7781

melanoaldehyde (Guan Y et al., 1995, 15(3), 178-179)

In another study **(with unroasted, roasted at 150 c, roasted at 250 c)** seed extract reduced serum level of total cholesterol by 40.04, 40.55 and 70.25% respectively (Awal MA et al., 2004, 7(4), 577-579).

Larvicidal and Antiplasmodial activity

Methanolic extract of seeds of plant has shown Larvicidal activity against Aides agypti mosquito which spread**s** dengue fever and culex pipiens mosquito that spreads Japanese encephalitis in a dose dependent manner (Jang YS et al., 2002, 18(3), 210-213).

Also the plant extract showed in-vitroAntiplasmodial activity against chloroquine sensitive Plasmodium falciparum (EI-Tahir A et al., 1999, 13(6), 474-478).

Anti-inflammatory and anti-nociceptive activity

The ethanolic extract of the leaves showed its effect on wound healing in rat excision wound model and observed that the wound contracting ability of the extract was more than that of control group (ointment base) and was comparable to the reference standard Nitrofurazone ointment. Thus ethanolic extract showed good anti-inflammatory activity (Jayasutha J et al., 2011, 3(3), 1547-1550). The Methanolic extract of the leaves of the plant decreased pain response in mice effectively. The LD_{50}values of the extract in mice weremore than 1800 mg/kg (Chidume FC et al., 2002, 81(2), 205-220).

Antidiabetic activity

In an study conducted by chaurasia et al.the antidiabetic screening of methanol extract of seeds of c.tora using single dose and prolonged treatment in normal and alloxan induced diabetic albino rats were evaluated. It was observed that when methanol extract was given at doses of 50,100 and 200mg/kg body weight orally the antidiabetic efficiency were good in normal, acute and prolonged treatment group especially at 200 mg/kg body weight. The study was conducted using the standard drug Glibenclamide (Chaurasia et al., 2011, 2(1), 759-766).

Antimutagenic and immunostimulatory activity

In an study the Antimutagenic potential of methanol seed extract was observed against aflatoxin B_1 (AFB_1) using S.typhimurium assay and N-methyl-N'-nitrosoguanidine assay method. The number of mutants in each case was lowered enormously with methanol extract using S.typhimurium TA100 and TA98 assay methods. It was seen that pure compound isolated form n-butanol fraction of methanol seed extract possesses good Antimutagenic activity while its aqueous fraction was inactive. The direct acting mutagen N-methyl-N'-nitrosoguanidine could not be inhibited both by Methanolic extract as well as by aqueous fraction (Choi JS et al., 1997, 63(1), 11-14). Also Benzo [a] pyrene induced DNA damage in human hepatoma cell linenHepG2 was significantly reduced by aqueous seed extract of C.tora using the comet assay method. The inhibitory effects were 70%, 60% and 20% with unroasted, roasted at 150^0C and roasted at 250^0C at concentration of 1mg/ml. The Benzo [a] pyrene induced damage in hepatoma cell line G2was inhibited by chrysophanol, emodin and rhein in a ratio of 75, 88 and 70% with unroasted, roasted at 150^0C and roasted at 250^0C at 1µM (Wu CH et al., 2001, 49(5), 2579-2586)

Antioxidant activity

In one study it was demonstrated that Methanolic & aqueous extract of seed showed antioxidant effect on peroxidation of linoleic acid. When compared with α-tocopherol, the Methanolic extract of seeds demonstrated strong antioxidant effect but weaker than butylated hydroxyanisole. The fraction of methanol extract obtained from methanol-water eluent solvent showed strong antioxidant effect and was found to be due to 1,3,8-trihydroxy-6-methyl-9,10-anthracene dion as was confirmed by UV, HPLC, IR, MS and NMR analysis (Yen GC et al., 1998, 46(3), 820-824).

II. CONCLUSION

Cassia tora is the important valuable plant for skin diseases and other disorders. As per USM, seeds are useful in leprosy, ringworm, pityriasis, vitiligo and melasma internally as well as externally. Scientific studies also proved some of USM claims and moreover these studies also proved that the seeds and leaves of this plant may be used for hypolipidemic activity, hypoglycemic activity, anthelmintic activity, antimutagenic activity, antifungal activity, hepatoprotective activity, purgative activity, anti-inflammatory activity, antioxidant activity and antimicrobial activity. For this purpose various journals and authenticated sources were used. The article not only provides considerable evidence in support of uses of the plant but also makes a strong basis for further investigation of new bioactive compounds reported so far from this plant. However, to extract the full benefits of the plant we need proper research, clinical trials as well as public awareness.

International Journal of Pharmaceutical Research and Applications
Volume 6, Issue 4 July-Aug 2021, pp: 631-634 www.ijprajournal.com ISSN: 2249-7781

REFERENCES

[1]. Lawrence G H M ,"Taxonomy of Vascular Plants",Oxford & IBH Publishing Co, (New Delhi) 1967.
[2]. The wealth of India: A raw material,Vol 3, Council of Scientific and Industrial Research: New Delhi,1992;368-370.
[3]. Kirtikar&Basu, Indian Medicinal Plants, vol 2, I, Dehradun,International Book Distributors, 1981, 353.
[4]. Cooke T. The Flora of Presidency of Bombay, Reprint edition Botanical Survey of India Calcutta, Vol 1;1967,447.
[5]. Sharma PC, Yelne M, Dennis TJ, Joshi Aruna, Prabhune YS, Database of Medicinal Plants used in Ayurveda & Siddha, Vol 2,CCRAS-New Delhi,2005,144-188.
[6]. Raghunathan K, Mitra R, Pharmacognosy of Indigenous Drugs. Central Council For Research in Ayurveda & Siddha, New Delhi, vol I, 1982, 199-213.
[7]. Keneda M, Morishita E, Shibata S, chemical studies on the oriental plant drugs,XXI. The Constituents of Cassia tora L, A glycosides of rubrofusarin. Chem Pharm Bull., 1969, 17(3), 458-461.
[8]. Meena AK, Niranjan US, Yadav AK, Singh B, A review on Cassia tora ethnobotany, phytochemical and pharmacological profile, J Pharm Res, 2010, 3(3), 557-560.
[9]. Shibata S, Morishita E, Kimura Y, Chemical studies on the oriental plant drugs. Chem Pharm Bull, 1969, 17(3), 454-457.
[10]. Choi JS, Lee HJ, Kang SS,Arch Pharma Res., 1994, 17(6), 462-466.
[11]. Zhu L, Zeng X, Zhao M, Preparative separation and purification of five anthraquinones from Cassia tora L. by high speed counter-current chromatography .Sep Purif Technol. 2008, 63 (3), 665-669.
[12]. Hallagan JB, Pariza MW, Putnam JM, Assessment of cassia mucilage. Food Chem Toxic 1997, 35 (6), 625-632.
[13]. Kubmarawa D et al, Int Res J Biochem & Bioinform. 2011, 1(9):222-225**)**.
[14]. Rejiya CS, Abraham A, Cibin TR, Leaves of cassia tora as a novel cancer therapeutic-An in vitro study. Toxicolo in vitro,2009, 23 (6), 1034-1038.
[15]. Acharya TK, Chattergee IB, Isolation of Chrysophanic acid-9-anthrone, the major anti Fungal principle of cassia tora, 1975, 38 (3), 218-220.
[16]. Panda NP, Ray P, A study of effect of some Indigenous Plant extracts against two hum An pathogens, Ian J Exp Biol Sci, 2012, 3(1), 175-179.
[17]. Guan Y, Zhao S, tablets in the treatments of hyperlipemia J Trad Med, 1995, 15 (3), 178
[18]. Awal MA, Hossain MS, Rahman MM, Bari MA, Haque ME, Antishigollosis activity of The root extract of cassia tora. Pak J Bio Sci, 2004, 7 (4), 577-579.
[19]. Jang YS, Baek BR, Yang YC, Kim MK, Lee HS, Larvicidal activity of leguminous seed And grains against Aedes agyptiand Culex pipiens pallens. J Am Mosq control Asso.2002, 18 (3), 210-213.
[20]. El-Tahir A, Satti GM, Khalid SA, Antiplasmodial activity of selected Sudanese medicin Al plants with emphasis on Acacia nilotica. Phytother Res. 1999, 13(6), 474-478.
[21]. Jayasutha J, Nithila MJS, Evaluation of wound healing activity of ethanolic extract of Aristolochia bracteata and Cassia tora on wistar albino rats. Int J Pharm Tech Res.2011,3(3), 1547-1550.
[22]. Chidume FC, Gamaniel KS, Antinociceptive and smooth muscle contracting activities of the Methanolic extract of cassia tora leaf, J Ethnopharmacology,2002,81(2),205-220.
[23]. Chaurasia B, Dhakad RS, Jain PK, Preliminary phytochemical and antidiabetic screening Cassia tora Lin. Int J Pharm Life Sci, 2011, 2(1), 759-766.
[24]. Choi JS, Lee HJ, Park KY, Kang SS, In-vitro Antimutagenic effects of anthraquinones Aglycones and naphthopyrone glycoside from cassia tora .Planta Med. 1997,63(1),11-14
[25]. Wu CH, Song TY, Yen GC, Inhibitory effects of cassia tora on benzo[a]pyrone mediate DNA damage toward HepG2 cells, J Agric Food Chem.2001, 49(5), 2579-2586.
[26]. Yen GC, Chen HW, Duh PD, Extraction and identification of an antioxidative component T from Jue Ming Zi (cassia tora) J Agric Food Chem,1998,46(3),82-824.