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REVIEW ARTICLE

Cassia Javanica Linn: A Review on Its Phytochemical and Pharmacological Profile

***Chittam K.P.[1], Deore S.L.[2]**

[1]Shri Jagdish Prasad Jhabarmal Tibrewala University, Chudela, Jhunjhunu, Rajasthan.

[2]Government college of Pharmacy Kathora Naka, Amravati.

ABSTRACT

Cassia javanica Linn is a small and medium sized tree with widely spreading horizontal branched and shows blossoms. Native to the tropical regions of Asia, Java Cassia is distributed naturally from India to Malaysia, Sumatra, Indonesia, southern China, and the Phillipines. This plant is used in several traditional medicines to cure various diseases. This plant has antidiabetic activity, antioxidant activity and antimicrobial activity. Despite harmful side effects, insulin and synthetic oral hypoglycemic agents are widely used in management of Diabetes mellitus. Frequently, herbal remedies are also preferred as they are safe for long-term use, easily accessible, and cost effective. There are many antidiabetic herbs recommended in traditional medicaments but still there is a worldwide quest for an ideal drug due to complex nature of the disease. The presented review summarizes the information concerning the uses, morphology, chemical constituents, and pharmacological properties of the *Cassia javanica* plant.

INTRODUCTION

Cassia javanica Linn. is a beautiful garden tree that belongs to family Leguminosae. It is cultivated throughout India for beautiful pink blossoms (1, 2). Previous literature provides information about therapeutic uses of the plant. Bark of *Cassia javanica* is used as one of the ingredients in antidiabetic ayurvedic formulation (3). Leaves are proved to be active against *Herpes simplex* infection (4). Leaves are reported to contain variety of secondary metabolites, such as, flavones, sterols, several hydrocarbons, anthraquinone, glycosides, etc. (5, 6). Among these flavones, glycosides and sterols are considered to be antidiabetic compounds (7, 8). The presence of these antidiabetic phytochemicals of *Cassia javanica* leaves may give desired pharmacological action. As there are no scientific data available regarding antidiabetic effects of leaves, it felt relevant to assess bioactivity of leaves of *Cassia javanica*.

TRADITIONAL USES:

The pods are used as medicinally as a substitute for cassia fistula. Pods are used as a purgative. The seeds may be useful as a source of industrial gum (9). It is also traditionally used medicinal plants in china and Southeast Asian countries. It is conventionally believed that the medical herb can reduce fever, decrease the virulence of pathogenic organisms, regulates the flow of chi and lubricate the intestine. In china it is applied to treat gastric pain, cold, malaria, measles, chickenpox, and constipation. It is also used as an antimicrobial agent (10, 4)

TAXONOMY:

Kingdom: Plantae

Sunkingdom: Tracheobionta

Superdivision: Spermatophyta

Division: Magnoliopsida

Class: Magnoliopsida

Order: Fabales

Family: Fabaceae

Genus: *cassia* L.

Species: *Cassia javanica* L. Var

VERNACULAR NAMES:

English: Apple blossom senna, javanise cassia

Hindi: Java ki rani

Marathi: Mazeli

Tamil: Konne, Vakai

MORPHOLOGY:

Cassia javanica is a medium sized tree with widely spreading horizontal branches and showy blossoms. Bark smooth, brownish grey. Leaves paripinnate with 5-15 pairs of leaflets, petioles 1.5-4.o cm long, leaflet are elliptical, ovate to oblong. Flowers are bright rose or pink, fading to white with red sepals, in elongated bracteates corymbs. Pods are cylindrical, dark brown, smooth 45-60 cm long, flesh dry. The heartwood is yellow to brown, moderately hard, heavy and coarse texture. The sapwood is perishable.

* ***Corresponding author:*** Chittam K. P,

Figure 1: *Cassia javanica* (11)

CHEMICAL CONSTITUENTS:

This plant comprises of different chemical compounds. Many compounds have been isolated from the plant *Cassia javanica* Linn. Seeds contains chrysophanol, physcion, two new anthroquinone 1, 5 dihydroxy- 4, 7 dimethoxy, 2 methyl antroquinone 3-O-α-L (-) rhamnopyranoside and 1, 3, 6, 7, 8- pentahydroxy-4-methoxy-2-methyl anthraquinone and hrysophanol and physcion are commonly occurring anthraquinone have been reported earlier.

The root bark contains quercetin and 2 new leucoanthocyanins, leucocyanidin-3-O-α-L-rhamnopyranoside and leucocyanidin-3-O-α-L-(-) rhamnopyranoside. From the stem bark 2 new anthroquinones, 1, 2-dihydroxy-1, 3; dihydroxy-6, 8,-dimethoxy-2-methyl anthraquinone and 1,3,5,8 tetrahydroxy-6-methoxy-2-methyl anthraquinone, β-sitosterol and n-octacosanol have been isolated.

The leaves contain new flavones rhamnoside, Javanine besides kaempferol, its 3-methyl and 7 methyl ethers. Flowers contain peonidin 3-O-L-rhamnopyranosides, leucocynidin 4-O-rhamnetin-3-glucopyromiside, quercetin. From ethanolic extract leucocyanidin-4-O-methyl ether-3-O-β-D-galactopyranosides, dihydrorhamnetin 3-o- β-D-glucopyranoside, quercetin was obtained (4, 12, 13).

PHARMACOLOGICAL PROPERTIES OF *CASSIA JAVANICA:*

ent-Epiafzelechin-(4aR8)-epiafzelechin extracted from *Cassia Javanica* Inhibits herpes simplex virus type 2 replication. Herpes simplex virus (HSV) is a ubiquitous organism that causes infections in human population throughout the world. It causes a variety of diseases ranging in severity from mild to life threatening. In this study ent-Epiafzelechin-(4aR8)-epiafzelechin extracted from fresh leaves of *Cassia javanica* L. agnes de Wit (Leguminosae) was investigated for its in vitro anti-HSV activity using XTT and plaque reduction assays (4).

Acute and sub-acute toxicity studies of the polyherbal antidiabetic formulation Diakyur in experimental animal models: aqueous extract of *cassia auriculata, Gymnema sylvestre, Mucuna pruriens, syzygium jambolanum, Terminalia arjuna* and a crude powder of *cassia javanica*. In an acute toxicity study, Diakyur was administered orally at doses ranging from 100-12800 mg/kg p.o. and animals were observed for any toxic symptoms up to 72 hrs. In subacute toxicity study, Diakyur was tested at the dose of 1600 mg/kg p.o. ones daily for 28

days. The animals were sacrificed on the 29th day and various biochemical parameters were measured (14).

HYPOGLYCEMIC AND LIPID-PER OXIDATIVE ACTIVITY:

The effect of Diakyur a polyherbal formulation composed of aqueous extract of *cassia auriculata, Gymnema sylvestre, Mucuna pruriens, syzygium jambolanum, Terminalia arjuna* and a crude powder of *cassia javanica* on blood glucose level of normal and diabetic animals as well as lipid peroxide level in normal and 28 day treated diabetic rats. The result indicates the significant hypoglycemic activity of Diakyur in both rats and rabbits, whereas an antilipid-peroxidative activity in diabetic rats (15).

ANTIMICROBIAL ACTIVITY:

A comparative study is reported on the antimicrobial activity of two species, *Senna alata* [*Cassia alata*], a coarse slightly woody herb and a native plant of America which was found to be rich in anthraquinones and flavonoid glycosides, and *Cassia javanica* subsp. *nodosa*, a tree of moderate to large size, found from southern China and Myanmar to western Malaysia. The nine microorganisms selected for the study were the Gram positive bacteria *Staphylococcus aureus* and *S. epidermidis*, the Gram negative bacteria *Pseudomonas aeruginosa* and *Burkholderia cepacia*, two strains of the yeast-like fungi *Candida albicans* and *Candida glabrata* [*Torulopsis glabrata*] and three dermatophytic fungi *Microsporum canis, Trichophyton mentagrophytes* and *T. rubrum*. Results showed that the nature of inhibitory activity was noted to be mainly cidal (death of the microorganism) as indicated by clear zones of inhibition. The fruit and leaf extracts of *S. alata* showed moderate inhibitory activity against the four bacteria with inhibitory diameter (ID) ranging from 10.0 to 12.5 mm. Meanwhile, *C. javanica* subsp. *nodosa* flower and leaf extracts were moderately active against *P. aeruginosa* and *S. epidermidis* with ID ranging from 12.5 to 13.9 mm (16).

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