



An overall view of cassia species phytochemical constituents and its pharmacological uses

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Abstract

Aim: In this study we will see about the approved cassia species, and an important cassia species and the detailed study of some important cassia species (common name, phytochemical constituents and its pharmacological effects). Cassia is a large genus of around 5000 species. Cassia is annual under shrub mainly present in tropical countries like India, Pakistan, Bangladesh and West-China. Cassia mainly contains Anthraquinone glycosides, flavonoids, tannins, sterols, proteins and gums. Many cassia species are mainly used for its antimicrobial activity, antioxidant activity and laxative effect. Cassia species is mainly used by people against various skin diseases such as ringworm, eczema and scabies and as a natural pesticide in organic farms.

Keywords: cassia species, phytochemical constituents, literature survey, ethnobotanical

Introduction

The world health organization estimates that about 80% of people living in developing countries rely on traditional medicines for their primary health care need. The medicinal properties have made an outstanding contribution in the origin and evolution of many traditional herbal therapies. Many plants contain a variety of phyto-pharmaceuticals which have found very important applications in the field of Agriculture, human and veterinary medicines. A large proportion of the world's population depends on traditional medicine because of the scarcity and high costs of orthodox medicine. An herbal medicine has lesser side effects compared to allopathic medicines in addition to the necessity of meeting the requirements of medicine for human population. Natural products play a dominant role in the development of novel drugs for the treatment and prevention of diseases ⁽³⁾. Currently 4,000 – 10,000 medicinal plants are on the endangered species list and the number is expected to increase.

Cassia ^[1]

Cassia species (*Caesalpinaceae*) have been well known for their laxative and purgative purposes. Cassia invites attention of researches worldwide for its phytochemistry and pharmacological activities ranging from Anti-diabetic to Anti-viral. Cassia is a large genus of around 5000 species of flowering plants in the family *leguminaceae* / *fabaceae*. Cassia species are already reported in the ancient ayurvedic literatures and literature survey indicated its use against various skin diseases such as ringworm, eczema, and scabies. Because of the high incidence of skin diseases, especially among the weaker section of the Indian population, it was felt worthwhile undertaking research on this plant. According to Ayurveda the leaves and seeds are acrid, laxative, antiperiodic, anthelmintic, ophthalmic, liver tonic, cardio tonic and expectorant. The leaves and seeds are useful in leprosy, ringworm, flatulence, colic, dyspepsia, constipation, cough, bronchitis, cardiac disorders. Cassia species powder made

from Cassia species seeds and Cassia species splits are some ancient natural ingredients. In India, Cassia species is used as a natural pesticide in organic farms. Roasted seeds are substituted for coffee, like tephrosia seeds. Cassia species powders are most popularly used in the pet-food industry. It is mix with guar gum for use in mining and other industrial application. The extracts of Cassia species have been used as a remedy for various skin ailments, rheumatic disease and as laxatives. The extract of Cassia species leaves has been found to possess significant hepatoprotective activity and anti-inflammatory activity.

Geographical Distribution ^[2]

Cassia species are annual under shrub grows all over the tropical countries (throughout India, Pakistan, Bangladesh and West-China) and grows well in wasteland as a rainy season weed ⁽⁷⁾. It grows in low lying coastal area, river banks, abundant in waste places and other moist places like uncultivated fields, up to 1000-1400 meters.

Some Species List of Cassia

<i>Cassia abbreviate</i>
<i>Cassia afrodistula</i>
<i>Cassia aldabrensis</i>
<i>Cassia aciphylla</i>
<i>Cassia aubrevillei</i>
<i>Cassia bakeriana</i>
<i>Cassia brewsteri</i>
<i>Cassia cardiosperma</i>
<i>Cassia eremophila</i>
<i>Cassia ferruginea</i>
<i>Cassia fikifiki</i>
<i>Cassia fistula</i>
<i>Cassia grandis</i>
<i>Cassia javanica</i>
<i>Cassia leiandra</i>
<i>Cassia leptophylla</i>
<i>Cassia nealiae</i>

<i>Cassia marksiana</i>
<i>Cassia notabilis</i>
<i>Cassia oligoclada</i>
<i>Cassia pleurocarpa</i>
<i>Cassia roxburghii</i>
<i>Cassia suratensis</i>
<i>Cassia alata</i>
<i>Cassia Alexandria</i>
<i>Cassia artemisioides</i>
<i>Cassia articulata</i>
<i>Cassia hirsute</i>
<i>Cassia obtusifolia</i>
<i>Cassia spruceana</i>
<i>Cassia italic</i>
<i>Cassia pinoi</i>
<i>Cassia thyrsoides</i>
<i>Cassia occidentalis</i>
<i>Cassia regia</i>
<i>Cassia sieberiana</i>
<i>Cassia siamea</i>
<i>Cassia tora</i>
<i>Cassia yucatan</i>



Fig 1: Cassia Fistula



Fig 2: Cassia Grandis



Fig 3: Cassia Javanica



Fig 4: Cassia Tora



Fig 5: Cassia Alata



Fig 6: Cassia Siamea

Morphology**Height:** 30-90 cm**Crop:** Annualherb**Altitude:** 1000-1400 meters**1. Leaves****Color:** Green color**Shape:** Petiole, opposite, conical at one end, ovate, oblong and base oblique**Height:** 6-8cm long**2. Flowers****Color:** Pale yellow**Shape:** Sessile pairs in the axils of the leaves with five petals, upper one are very crowded**3. Pods****Shape:** Incompletely septate, membranous with numerous brown oblong rhombohedral seeds**Height:** 6-12 inch long ^[9]**Phytochemical Constituents ^[2]**

Parts	Chemical Constituents
Leaves	<ul style="list-style-type: none"> Anthraquinone glycosides <ul style="list-style-type: none"> rhein, emodine, physion, chrysophanol), Obtusin, chrysoobtusin, chryso-obtusin-2-O-β-D-glucoside, obtusifolin Flavnoids
Root	<ul style="list-style-type: none"> Betulinic acid, chrysophanol, Physcion, Stigmasterol, 1hydroxy-7-methoxy-3-methyl-anthraquinone, 8-O-methylchrysophanol, 1-Omethylchrysophanol Aloe-emodin
Seed	<ul style="list-style-type: none"> Anthraquinones Aurantio-obtusin, Chryso-obtusin, obtusin, Chrysoobtusin-2-O-beta-D-glucoside, Physcion, Emodin, Chrysophanol, Obtusifolin, Obtusifolin-2-O-beta-D-glucoside, Phenolic glycosides rubrofusarintriglucoside, nor-rubrofusaringentiobioside, demethylflavasperonegentiobioside, torachrysonegentiobioside, torachrysonetetraglucoside, torachrysonapioglucoside. Gums (7.65%)
Stem bark	<ul style="list-style-type: none"> Anthraquinones 1hydroxy-5-methoxy-2-methyl anthraquinone, d-mannitol, myricyl alcohol, β-sitosterol, glucose, tagonelline, 1-stachydine and choline.

Important Cassia Species [4, 5, 6, 7, 8, 9]

S.No	Name	Common Names	Phytochemical Constituents	Medicinal uses
1.	<i>Cassia fistula</i>	Hindi: Sonali, Amultus ENGLISH: Golden Shower Tamil: Shrakonnai	<ul style="list-style-type: none"> ▪ Anthraquinones, ▪ Flavonoids, ▪ Terpenoids, ▪ Reducing sugars, ▪ Saponins, ▪ Tannins, ▪ Carbonyl phlobatanin, ▪ Steroids, ▪ Glucoside, ▪ Rheinglucosides. 	<ul style="list-style-type: none"> ▪ Anti-diabetic activity ▪ Hypolipidemic activity ▪ Hepato protective activity ▪ Antioxidant activity ▪ Antipyretic activity ▪ Anti-inflammatory activity ▪ Antitussive activity ▪ Anti-leishmanial activity ▪ CNS activity ▪ Antimicrobial activity ▪ Antimicrobial activity ▪ Antitumor activity ▪ Anti- ulcer activity
2.	<i>Cassia javanica</i>	Hindi: Javaniki-Rani English: java cassia Tamil: kondrai	<ul style="list-style-type: none"> ▪ Anthraquinones, ▪ Reducing sugars, ▪ Proteins, ▪ Alkaloids, ▪ Tannins, ▪ Glycosides, ▪ Flavonoids, ▪ Sterols, ▪ Quercetin, ▪ Emodin ▪ Chrysophanol, ▪ Physcion. 	<ul style="list-style-type: none"> ▪ Hypoglycemic activity ▪ Anticancer and antimycotic activity ▪ Antioxidant activity ▪ Antiviral activity ▪ Antimicrobial activity ▪ Haemolytic activity
3.	<i>Cassia grandis</i>	Pink shower Stinking toe Coral shower Carao	<ul style="list-style-type: none"> ▪ Anthraquinones, ▪ Sterols, ▪ Flavonoids, ▪ Naphthalene derivatives, ▪ Protein, ▪ Tannins, ▪ Alkaloids. 	<ul style="list-style-type: none"> ▪ Anti- inflammatory activity ▪ Medicinal ▪ Source of medicine ▪ Other Uses ▪ Animal feed ▪ Ornamental purpose ▪ Revegetation ▪ Materials ▪ Gum, wood, timber
4.	<i>Cassia abbreviata</i>	Long pod cassia	<ul style="list-style-type: none"> ▪ Anthraquinone derivatives, ▪ Guibourtinidiol, ▪ Alkaloids, ▪ Tannins, ▪ Crude proteins, ▪ Flavonoids, ▪ Sterols. 	<ul style="list-style-type: none"> ▪ Anti plasmodic activity ▪ Treatment for Malaria ▪ Treatment for Pneumonia
5.	<i>Cassia occidentalis</i>	Kasondi	<ul style="list-style-type: none"> ▪ Anthraquinone, ▪ Anthrone, ▪ Cassiolein, ▪ Quercetin, ▪ Aloe emodin, ▪ Rhein, ▪ Tannins. 	Treatment <ul style="list-style-type: none"> ▪ Stomachic ▪ Flatulence ▪ Constipation ▪ Cough ▪ Fever ▪ Asthma
6.	<i>Cassia obovata</i>	Neutral henna	<ul style="list-style-type: none"> ▪ Anthraquinones, ▪ Chrysophanic acid, ▪ Tannins, ▪ Sterols, ▪ Flavonoids. 	<ul style="list-style-type: none"> ▪ Inhibitors of skin fungus ▪ Mice infestations
7.	<i>Cassia spectabilis</i>	Spectacular cassia	<ul style="list-style-type: none"> ▪ Flavenol, ▪ Anthraquinone, ▪ Tannins, ▪ Alkaloids, ▪ Emodin. 	<ul style="list-style-type: none"> ▪ Antifungal activity ▪ Antibacterial activity ▪ Antioxidant activity ▪ Anti diarrhoeal activity
8.	<i>Cassia tora</i>	Sickle pod Thakara Coffee pod Tovara	<ul style="list-style-type: none"> ▪ Cinnamaldehyde, ▪ Gum, ▪ Tannins, ▪ Mannitol, 	<ul style="list-style-type: none"> ▪ Laxative ▪ Anthelmintic activity ▪ Ophthalmic use ▪ Antiperiodic

			<ul style="list-style-type: none"> ▪ Coumarins, ▪ Pinene, ▪ Eugenol. 	<ul style="list-style-type: none"> ▪ Anti-leprosy activity ▪ Anti – flatulence ▪ Cough ▪ Bronchitis ▪ Cardiac disorders
9.	<i>Cassia nigricans</i>	Shuwakangargari	<ul style="list-style-type: none"> ▪ Flavonoids, ▪ reducing sugars, ▪ Anthracene, ▪ Tannins, ▪ Alkaloids, ▪ Saponins, ▪ Hydroxyanthraquinone, ▪ Hepatadecanoic acid, ▪ β-sitosterol acetate. 	<ul style="list-style-type: none"> ▪ Antiulcer activity ▪ Anti oedema ▪ Activity ▪ Antioxidant activity ▪ Anti-inflammatory ▪ Anti-cancer activity ▪ Anti-plasmodia <p>Treatment</p> <ul style="list-style-type: none"> ▪ Gastro intestinal disorder ▪ Diarrhoea ▪ Skin disease(scabies, ringworm, eczema) ▪ Sore throat(Infusion)
10.	<i>Cassia sieberiana</i>	Drumstick tree <i>Cassia kotschyana</i>	<ul style="list-style-type: none"> ▪ Anthraquinone, ▪ Tannins, ▪ Saponins, ▪ Flavonoids, ▪ Alkaloids, ▪ Taxol. 	<ul style="list-style-type: none"> ▪ Purgative ▪ Emetics ▪ Treat skin disease ▪ Treat fish poison ▪ Treat sterility disorders

Herb Drug Interactions

Cassia species has been predicted to interact with a number of drugs that lower potassium (such as the corticosteroids, or drugs where the effects become potentially harmful when potassium is lowered).

Conclusion

Cassia species create attention about this plant for their pharmacological, traditional and medicinal values. There is huge scope for research on *Cassia* species and would be further exploited in future as a source of useful phytochemical compound for the Pharma industry.

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