

## Micro-Review

## Phytochemical and Pharmacological Investigations of Genus *Cassia*: A Review

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Genus *Cassia*, a tropical genus, belongs to Leguminosae family and Caesalpiniaceae subfamily. It is well known to physicians from very old days. It has more than 600 species as herbs, shrubs and trees. About 26 species of genus *Cassia* have been reported to contain anthracene derivatives. The more important species among them are *Cassia alata*, *Cassia angustifolia* vahl, *Cassia autifolia*, *Cassia cinnamon*, *Cassia fistula*, *Cassia nodosa*, *Cassia obtusifolia*, *Cassia sophera*, *Cassia tora* and *Cassia zeylanicum*. Diuretic, antidiabetic, antibiotic, antifungal, antipyretic, anthelmintic, antibacterial, antirheumatic, anti-eczema, antiherpetic, antiasthmatic, anti-leprosy, anti-typhoid and anti-bronchitis activities have been reported from some of these species.

### Phytochemical Investigation

The genus *Cassia* is found to contain a wide variety of constituents mentioned in Table-1.

TABLE-1  
PHYTOCHEMICAL INVESTIGATION OF GENUS *CASSIA*

Name of species and parts investigated	Name of constituent	Ref.
1. <i>Cassia alata</i>		
(a) Leaves	(i) Aloe-emodin	
	(ii) $\beta$ -Sitosterol	
	(iii) Kaempferol	
	(iv) 1,8-Dihydroxy anthraquinone-3-carboxylic acid	1
	(v) Chrysophanol	
	(vi) Cassia xanthone	
	(vii) Anthraquinone glycosides	
	(viii) Physcion-1-glycose	
	(ix) 2-Methyl anthraquinone	
	(x) Protocatechuic acid	
(b) Seeds	(i) Chrysophanol	2, 6
	(ii) $\beta$ -Sitosterol	
	(iii) Fatty acids	
	(iv) Polyalcohols	
(c) Roots	(i) 1,3,8-Trihydroxy-2-methyl anthraquinone	
	(ii) 1,5-dihydroxy-8-methoxy-2-methyl and anthraquinone-3- <i>o</i> - $\beta$ -D(+)-glucopyranosides	3

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Name of species and parts investigated	Name of constituent	Ref.
(d) Whole plant	(i) Sesquiterpenes	
	(ii) Phenolic compounds	
2. <i>Cassia angustifolia</i>		
(a) Leaves	(i) Glucosides	
	(ii) Kampferol	
	(iii) Anthraquinone	
	(iv) Essential oil	
	(v) Isorhamnetin	
	(vi) Calcium oxalate	
	(vii) Flavanols	
	(viii) Rhein	
	(ix) Emodin	
(b) Seeds	(i) $\beta$ -Sitosterol	5
(c) Fruits	(i) Sennoside-A	6
	(ii) Sennoside-B	
	(iii) Glycosides of rhein	
	(iv) Chrysophanic acid	24
	(v) Emodin glycoside	
	(vi) Oxymethyl anthraquinone	
3. <i>Cassia autifolia</i>		
(a) Whole plant	(i) Sennoside A and B	
	(ii) 3-Hydroxy methyl 1,8-dihydroxyanthraquinone	24
	(iii) Isorhamnetin	
	(iv) Palmidin-A	
	(v) Dianthrone	
	(vi) Diglycoside	
	(vii) Rhein anthrone-8-glycoside	
	(viii) Rhein-8-diglycoside-6-hydroxy musizin glucoside, tinnevellin, isorhamnetin, calcium oxalate	
4. <i>Cassia cinnamon</i>		
(a) Stem bark	(i) Volatile oil	
	(ii) Starch	
	(iii) Calcium oxalate	24
	(iv) Tannins	25
	(v) Cinnamic aldehyde	
	(vi) Eugenol	
	(vii) Coumarin	
	(viii) Caryophyllene	
	(ix) Methyl-O-cumin aldehyde	
	(x) Cinnamyl acetate	
	(xi) Pinene	
5. <i>Cassia fistula</i>		
(a) Leaves	(i) Fistulic acid	25
	(ii) Anthraquinone	
(b) Root, Bark	(i) Fistucacidin	24
	(ii) Flavanoids	
	(iii) Phlobaphenes	
(c) Flowers	(i) Fistulin	
	(ii) Triterpene	
(d) Heart wood	(i) (-) Epialzelechin leucopelargonidin trimer	

Name of species and parts investigated	Name of constituent	Ref.
6. <i>Cassia nodosa</i>		
(a) Root, bark	(i) 1,8-Dihydroxy-6,7-dimethoxy 2-methyl anthraquinone	7
7. <i>Cassia obtusifolia</i>		
(a) Leaves	(i) Stigmasterol	
	(ii) $\beta$ -Sitosterol	
	(iii) $\beta$ -D-glucoside	8
	(iv) Triacontan-1-ol	
	(v) Palmitic acid	
	(vi) Stearic acid	
	(vii) Succinic acid	
	(viii) <i>d</i> -Tartaric acid	
	(ix) Uridine	
	(x) Myo-inositol	
	(xi) <i>d</i> -Ononitol	
	(xii) Friedelin	
	(xiii) Kaempferol	
	(xiv) Jugtanin	
	(xv) Astragalin	
	(xvi) Quercitrin	
	(xvii) Quercitrin ISO	
(b) Seeds	(i) Chrysophanol	9
	(ii) Physcion	
	(iii) Obtusifolin	
	(iv) 1,6,7-Trimethoxy-2,8-dihydroxy-3-methyl anthraquinone	
	(v) 1,6,7,8-Tetramethoxy-2-hydroxy-3-methyl anthraquinone	10
	(vi) 1,7-Dimethoxy-2,6,8-trihydroxy-3-methyl anthraquinone	
	(vii) Gluco-obtusifolia	
	(viii) Gluco-aurantioobtusin	11
	(ix) Cassiaside-glucoside (Norrubrofusarin-6- $\beta$ -mono-d-glucoside)	12, 13
	(x) Amino acids	14
	(xi) Torosachryson	15
	(xii) Isotalactone	
	(xiii) Cassialactone	
	(xiv) D-(+)-ononitol (I)	
	(xv) Galactosyl anonitol (II)	
	(xvi) 1-Desmethyl chrysoobtusin (I)	
	(xvii) 1-Desmethyl obtusin(II)	
	(xviii) 1-Desmethyl aurantioobtusin (III)	
	(xix) Chrysophanol-10,10-boanthrone	
	(xx) Questin	16
	(xxi) Benzoic acid	
	(xxii) Alaternin	
	(xxiii) 1-O- $\beta$ -D glucopyranoside	
	(xxiv) Chryso-obtusin 2-O- $\beta$ -glucopyranoside	
	(xxv) Physcion-8-O- $\beta$ -D-glucopyranoside	17

Name of species and parts investigated	Name of constituent	Ref.
(c) Roots	(i) Anthraquinones: islandicin, physcion, helminthosporin, chrysophanol, xanthorin, 8-O-methyl chrysophanol, obtusifolin, emodin, aloe-emodin (ii) Naphtho- $\beta$ -pyrone-rubrofusarin (iii) Benzoquinone 2,5-dimethoxy benzoquinone (iv) Phytosterols (v) Betulinic acid	18
8. <i>Cassia sophera</i>		
(a) Whole plant	(i) Emodin (ii) Chrysophanic acid	
9. <i>Cassia tora</i>		
(a) Leaves	(i) Flavonoids (ii) Triterpenes	
(b) Seeds	(i) Emodin (ii) Rubrofusarin (iii) 1,8-dihydroxy anthraquinone (iv) Xanthone derivatives (v) Physcion (vi) Chrysophanol (vii) Torachryson (viii) Toralactone (ix) Obtusifolin	
10. <i>Cassia zeylanicum</i>	(i) Engenol (ii) Cinnamic aldehyde (iii) Flavan-3-ol-glucoside (iv) (-) Epicatechin 3-O-8-C and C- $\beta$ -D glycopyranoside (v) Oligomeric pyroanidins	24

### Pharmacological Investigations

*Cassia alata* is effective against ringworm, skin diseases, asthma, cough, bronchitis and acts as antibacterial, fungicide, antibiotic and diuretic<sup>19</sup>.

*Cassia augustifolia* is effective against catharsis, diabetes, typhoid, leprosy, tumors and acts as antibacterial and purgative<sup>20</sup>.

*Cassia autifolia* acts as laxative and stimulates muscular coat of the intestine and produces purgation.

*Cassia cinnamon* bark is used as carminative, stomachic, mild astringent and antiseptic<sup>21</sup>.

*Cassia fistula* is used against skin diseases, syphilis, tuberculosis, blood poisoning and acts as antirheumatic, antipyretic and astringent.

*Cassia nodosa* acts as antibacterial antibiotic, antifungal, antipyretic and analgesic<sup>7</sup>.

*Cassia obtusifolia* leaves are effective against asthma, piles, ringworm, skin diseases, headache and acts as anthelmintic, antipyretic, diuretic, laxative and antifungal<sup>22</sup>.

*Cassia tora* is effective against skin diseases, leprosy, poriasis, ringworm, plaque, spots or eye diseases, liver complaints and acts as anthelmintic, laxative and antiinflammatory<sup>24</sup>

*Cassia zeylanicum* is used as antiulcerogenic and anti allergic<sup>24</sup>.

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(Received: 25 September; Accepted: 3 November 1989)

AJC-1614