



REVIEW ON CASSIA SOPHERA LINN. - A MULTIPURPOSE HERBS

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ABSTRACT

The use of plants for healing purposes predates human history and forms the origin of much modern medicine. Many conventional drugs originated from plant sources: a century ago, most of the few effective drugs were plant based. Phytomedicines are traditionally used in the treatment of various disorders and are now included as complementary and alternative medicine for patients because they are easily accessible, do not require laborious pharmaceutical synthesis and are relatively safe even on prolong use. It is generally predictable that over 6000 plants in India are in use in traditional, folk and herbal medicine. The present article focuses phytochemical and pharmacological aspects of the plant *Cassia sophera*. *Cassia sophera* also known as 'Kasondi' serves as multipurpose herbs and has widely as traditional medicine. It is recognized as a rich source of flavanoids and anthraquinones. The plant elicits for analgesic, anticonvulsant, antioxidant, anti-inflammatory, hepatoprotective and antiasthmatic activity etc. due to their valuable bioactive predominance present in the plant.

KEYWORDS: *Cassia sophera*, anticonvulsant, analgesic, Unani medicine, hypnotic, Antioxidant, Anti-inflammatory.

INTRODUCTION

Herbal medicines which formed the basis of health care throughout the world since the earliest days of mankind are still broadly used and have substantial importance in international trade. Recognition of their clinical, pharmaceutical and economic value is still growing, although this varies widely between countries. Medicinal plants are important for pharmacological research and drug development, not only when plant constituents are used directly as therapeutic agents, but also as starting materials for the synthesis of drugs or as models for pharmacologically active compounds. Regulation of exploitation and exportation is therefore essential, together with international cooperation and coordination for their conservation so as to ensure their availability for the future.^[1] Total Indian market for the ayurvedic formulation is of 1000 million dollars a year while the exports of ayurvedic medicines have reached a value of 100 million dollars a year. About 60% of this is crude herbs (to be manufactured into products outside India), about 30% is finished product shipped abroad for direct sales to consumers, and the remaining 10% is partially prepared products to be finished in the foreign countries.^[2] *Cassia sophera* Linn. (Caesalpinaceae) known as 'Kasondi' is an important drug of Islamic System of Medicine (Unani Medicine).







Fig. 1: C.Sophera plant.

'Kasondi' is described in unani literature to be repulsive of morbid humors, resolvent, blood purifier, carminative, purgative, digestive, diaphoretic and reported to be useful in epilepsy, ascites, dyscrasia of liver, skin disorders, piles, jaundice, fever, articular pain and palpitation. In ethno botanical literature it is mentioned to be effective in the treatment of pityriasis, psoriasis, asthma, acute bronchitis, cough, diabetes and convulsions of children.^[3]

Plant	Habitat	Vernacular name	Action	Reference
<i>Cassia sophera</i> (Calsalpinaceae.)	In gardens as hedge throughout India	English: Sophera Senna. Ayurvedic:Kaasamarda. Unani:Kasondi. Siddha /Tamil :Ponnaavaarai.	Leaves, seeds, bark—cathartic; considered specific for ringworm and other skin diseases (bark may cause dermatitis); used for bronchitis and asthma.	[4]

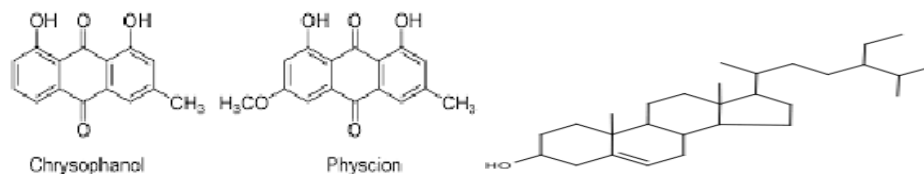
Morphological description of *C.Sophera* Plant

Leaves	Seed	Root	Flower	Reference
				[5,6]
Leaves are green in color & 8-10 in pairs. Lanceolate, acute. Petioles are 1.5-2mm long, glabrous.	Seeds are dark brown in color with 2mm thickness & having 8 x 4 mm in size. Present in 30-40 in number. Broadly ovoid, acute compressed.	Dark brown in color having diameter 20-50 mm. Length is about 15-20 cm.	Flowering season : Summer Flower color : Yellow Flower type : Hermaphrodite Characteristics : Cluster flower	

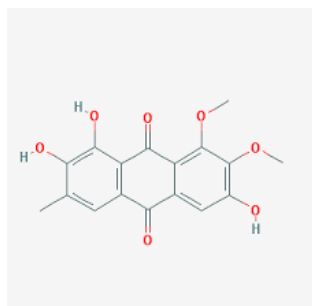
Phytochemistry of *C.sophera*

The chemical analysis of seed of *C.sophera* Linn. revealed the presence of ascorbic acid, dehydroascorbic acid and β sitosterol.^[7] A new anthraquinone diglycoside

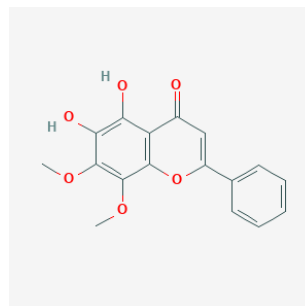
has been isolated from *C.sophera* root bark and characterized as 1,8-dihydroxy-2- methylanthraquinone 3-neohesperidoside along with sitosterol, chrysophanol and physcion.^[8]



From the heartwood of *C.sophera* two new isomeric anthraquinones^[9], 1,2,7-trihydroxy-6,8- dimethoxy-3-methyl and 1,2,6-trihydroxy7,8-dimethoxy-3.



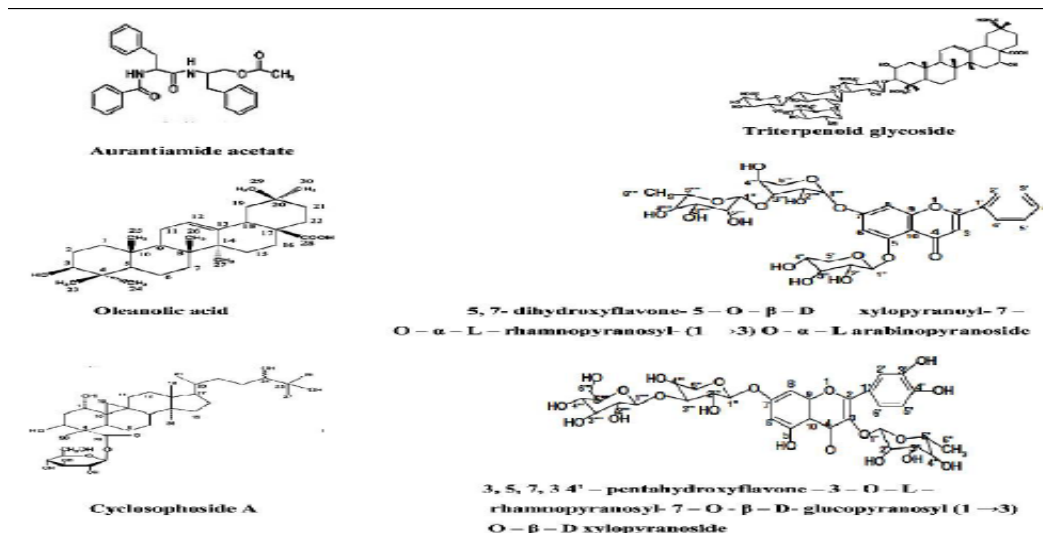
1,2,7-trihydroxy-6,8- dimethoxy-3-methyl



1,2,6-trihydroxy7,8-dimethoxy-3

Two new anthraquinones have been isolated from the root bark of *C.sophera* and characterized as 1,8-dihydroxy-3,6-dimethoxy-2-methyl-7-vinylantraquinone and 1,3-dihydroxy 5,7,8-trimethoxy-2-methylantraquinone.^[10] Cycloartane triterpene glycoside named Cyclosophoside A has been isolated by Yan et al. (2007) from the seeds of *Cassia sophera* (Figure 8). A new hydroanthracene derivative named

presengulone named 9-(62 -methoxy-32 -methyl 32,82,92 - trihydroxy-12 -oxo-12,22,32,42 - tetrahydroanthracene-72 yl)-5,10-dihydroxy-2- methoxy-7-methyl-1,4-antraquinone] was isolated, together with physcion, physcion bianthrone, xanthorin, floribundone-1, sosengulone, sengulone, and anhydrophlegmacin 9,10-quinones A2 and B2 has been isolated by Gizachew et al (1998).^[11]



Seven chemical compounds were isolated from the leaves of *Cassia sophera* Linn and analysed by GC-MS. The identified compounds are (1) Butanedioic Acid, (2) 1, 2, 4-Butanetriol Triacetate, (3) 7-Hexadecene, (4) E-

15-Heptadecenal, (5) 1, 2-Benzenedicarboxylic acid, (6) 3-Eicosene, and (7) 10-Heneicosene with retention time are 15.99, 13.763, 19.93, 18.03, 11.4, 16.70 and 9.54 respectively.^[12]

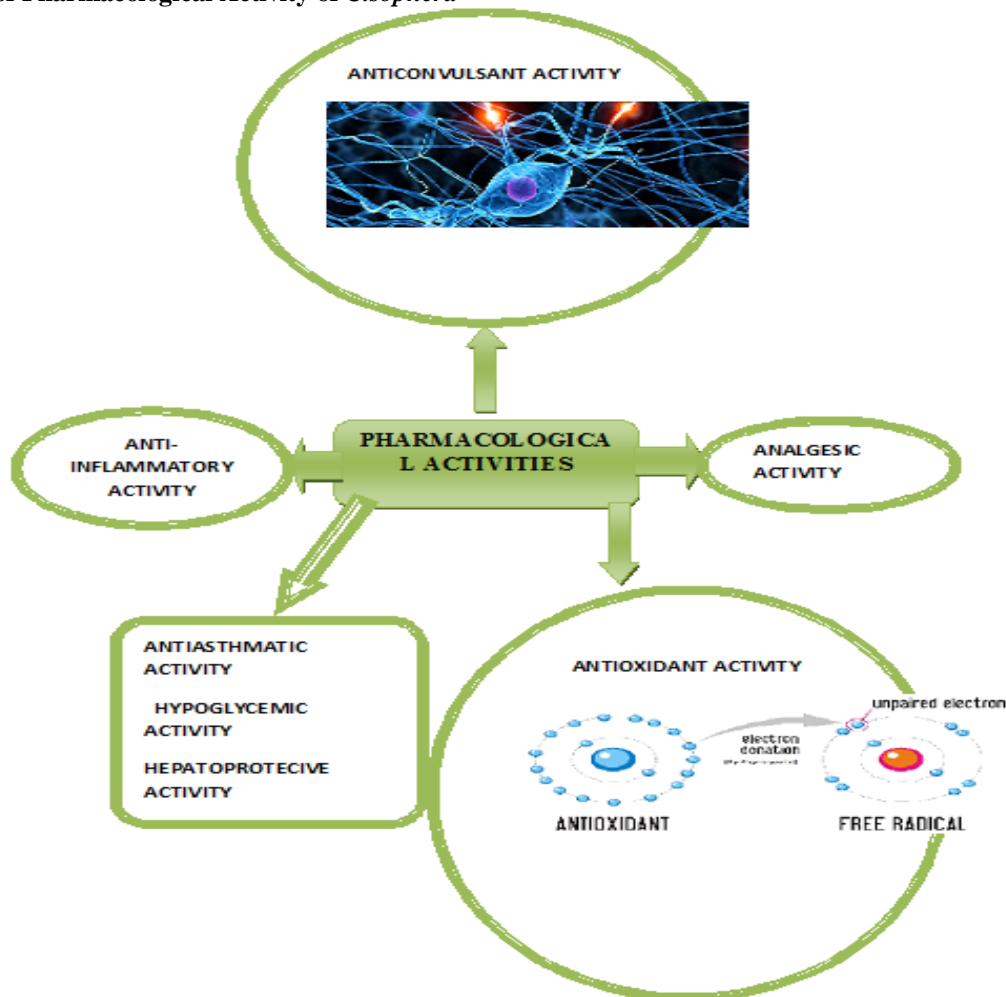
Phytopharmacological work done on *C.sophera*

Plant parts	Activity	Reference
Seed coat of <i>C. sophera</i>	Ethyl acetate extracts of matured seed coat of <i>C. sophera</i> has larvicidal activity of against <i>Culex quinquefasciatus</i> . The result of preliminary qualitative phytochemical analysis of the seed coat revealed the presence of some secondary metabolite such as saponin, alkaloid and cardiac glycosides.	[13]
Seed of <i>C. sophera</i>	Various pharmacological activities in rats were studied. Ethanolic extract of seed was studied for assess antinociceptive activity, hypnotic and sedative effect, while anticonvulsant activity was evaluated by Maximum electroshock-induced seizure test and Pentylenetetrazol induced seizure test.	[14]
Leaves of <i>C. sophera</i>	Dried methanol leaves extract of <i>C.sophera</i> L. was dissolved in distilled water, and then fractionated by re-extracting with n-hexane, chloroform, and ethyl acetate, subsequently. The free radical scavenging activity (FRSA) of methanol extract and various fractions of methanol extract was evaluated by 1, 1-diphenyl-2-picrylhydrazyl (DPPH) assay. The Free radical scavenging activity of ethyl acetate fraction was superior to all other fractions (IC ₅₀ = 15.42 g/ml), which was superior to synthetic antioxidant BHA (18.25 µg/ml). The total phenolic content in EtOAc fraction (13.25%) was the highest as compared to other extracts. This result suggests that this plant could supply as a source of natural antioxidants and preservative agents.	[15]
Leaves of <i>C. sophera</i>	Ethanolic leaves extracts of <i>C.sophera</i> was studied to evaluated hepato-protective activity. The extracts at doses of 200 and 400 mg/kg were administered orally once daily. Silymarin was used as standard reference and exhibited significant hepatoprotective activity against carbon tetrachloride-induced hepatotoxicity in rats. The outcomes of this study strongly indicate that <i>C.sophera</i> leaves have potent hepatoprotective action against carbon tetrachloride-induced hepatic damage in rats. This study suggests that possible activity may be due to the presence of flavonoids in the extracts.	[16]
Leaves of <i>C. sophera</i>	The alcoholic leaf extract of <i>C.sophera</i> effectively controlled the growth of most of the tested uropathogens. <i>C.sophera</i> was analyzed for antibacterial potential against various uropathogenic bacteria by agar well diffusion method. Minimal inhibitory concentrations (MIC) of the alcoholic extract were determined by broth microdilution method. It showed maximum activity against <i>Escherichia coli</i> , <i>Klebsiella pneumoniae</i> and <i>Pseudomonas aeruginosa</i> , with moderate	[17]

	activity against <i>Staphylococcus saprophyticus</i> , <i>Proteus mirabilis</i> and <i>Citrobacter freundii</i> . MIC values of the extract against tested uropathogens ranged from 3.05 to 49.0 µg/ml. This studied showed that extracts of <i>C.sophera</i> contain good antibacterial activity.	
Leaves of <i>C. sophera</i>	Dried herbal parts of CS were first extracted with 95% ethanol (CSEXT) and subjected for successive fractionation with different solvents such as chloroform, ethyl acetate and then with ethanol. All fractions showed significant and dose dependent anti inflammatory activity.	[18]
Leaves of <i>C. sophera</i>	<i>C.sophera</i> leaf extract were studied for antidiabetic and antilipidemic activity. The leaf extract of <i>C.sophera</i> (dose = 200 and 400 mg/kg) body weight was administered orally to control and streptozotocin induced diabetic rats for 30 days. The blood glucose and lipid profile were estimated after administration of the extracts. Treatment with the leaf extract normalized the increased elevation of all parameters with reference to diabetic and lipidemic activity.	[19]
Leaves of <i>C. sophera</i>	Ethanol leaves extract of <i>C. sophera</i> was found to produce significant laxative activity & Diuretic activity.	[20]
Leaves of <i>C. sophera</i>	Powdered leaves of <i>C. sophera</i> was extracted with ethanol and subjected for sequential fractionation with chloroform, ethyl acetate and ethanol respectively. Antiasthmatic activity of parent ethanol extract and chloroform, ethyl acetate and ethanol fractions of <i>C. sophera</i> were evaluated. From the above finding it was concluded that ethanol fraction showed highest activity apart from other fractions and parent extract. It may be due to presence of flavonoids.	[21]
Root of <i>C. sophera</i>	A bioactive relevant natural pigment 1,6, Dihydroxy-3-methyl-9-10-anthraquinone showed anti-cancer activity. This compound inhibit the proliferation of several cancer lines at different extents.	[22]
Seed of <i>C. sophera</i>	Seed methanol extract of <i>C. sophera</i> (MECS) produced inhibition zone of 20 mm in disc diffusion assay and MIC of 250 and 125 µg/mL respectively in broth dilution assay against <i>Mycobacterium semegmatis</i> . Phytochemical analysis indicated that anti-mycobacterial activity of MECS may be due to presence of alkaloids or flavonoids. The result revealed the promising anti-mycobacterial activity against MDR strain of <i>M. tuberculosis</i> .	[23]

Summary of Medicinal uses of *C.sophera*

Homeopathic uses	Folkloric uses			Herbal uses	Reference
Osteoarthritis	Juice	Root	Leaves	Seed	
Asthma	Externally, used for washing syphilitic sores.	Root taken internally with black pepper for snake bites.	Bruised leaves and bark of root, powdered and mixed with honey, applied externally to ringworm and ulcers.	Infusion of bark or powdered seeds, with honey, given for diabetes	Apositia
Allergic Rhinitis	Juice dropped into ears invaded by insects.		Infusion of leaves, mixed with sugar, used for jaundice	Seeds used for fever.	3-4 teaspoons sap of its leaves taken twice a day with one glass of water of green coconut cures diarrhea.
	Expectorant for coughs				Use to cure asthma, cough and bronchitis
	Leave juice+ sandalwood/Lime waater = For ringworm treatment.				

Summary of Pharmacological Activity of *C.sophera***CONCLUSION**

Natural products are the source of synthetic and traditional herbal medicine. They are still the primary health care system in some parts of the world. In India, local empirical knowledge about medicinal properties of plants is the basis for their uses as home remedies. It is generally accepted by many Indians and elsewhere in the world that beneficial medicinal effects can be obtained by ingesting plant products.^[25] *Cassia sophera* (Senna sophera) commonly known as Kasaudi is possibly originating in Bangladesh.^[26] Nowadays the plant is found in most tropical countries. It is common on waste lands, on roadsides and in the forests. Root bark is used for preparation of the medicine. In the past era Indian physicians use this plant for its efficacy in respiratory disorders. The present article spotlights the phytochemical and pharmacological aspects of the plant *Cassia sophera*. The plants showed their vitality and utility due to their versatile bioactive constituents which prove their multipurpose uses in Herbal, Folkloric and Homeopathic & Unani medicine system. It is recognized as a rich source of flavanoids and anthraquinones. The plant elicits analgesic, anticonvulsant, antioxidant, anti-inflammatory, hepatoprotective and antiasthmatic activity. This present review work focuses on the

morphological detail of the plant along with their phytochemistry and pharmacological activities.

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