

Overview on Plant *Cassia Sophera* Linn

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ABSTRACT

Medicinal herbs are moving from fringe to mainstream use, with a more significant number of people seeking remedies and health approaches free from side effects caused by synthetic chemicals *Cassia sophera* Linn. (Caesalpinaceae), an important drug in Unani medicine, act as a blood purifier, carminative, purgative, digestive, and diaphoretic. Many compounds have been reported from plants belonging to genus *Cassia*. This article aims to provide a comprehensive review of the phytochemical and pharmacological aspects of *Cassia sophera*. It is obtained from deciduous and mixed-monsoon forests throughout greater parts of India, ascending to 1300 m in outer Himalaya. It is widely used in the traditional medicinal system of India has been reported to possess analgesic, anticonvulsant, antioxidant, anti-inflammatory, hepatoprotective and antiasthmatic activity, etc. India officially recognizes over 3000 plants for their medicinal value. It is generally estimated that over 6000 plants in India are in use in traditional, folk, and herbal medicine.

Keywords: *Cassia sophera*, hepatoprotective, anticonvulsant, anti-inflammatory, carminative, purgative

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INTRODUCTION

Plants have great potential uses, especially as traditional medicine and pharmacopoeial drugs. A large proportion of the world's population depends on traditional medicine because of the scarcity and high costs of orthodox medicine.^[1] Medicinal plants have provided modern medicine with numerous plant-derived therapeutic agents.^[2] Many plants contain a variety of phytopharmaceuticals, which have very important applications in the fields of agriculture, human and veterinary medicine. Natural products play a dominant role in the development of novel drug leads for the treatment and prevention of diseases.^[3] The need to screen plants for pharmaceuticals is particularly urgent in the light of rapid deforestation and the concurrent loss of biodiversity throughout the world. It is very important to have sufficient knowledge regarding herbs not only because of their widespread use but also because they have the potentials to cause reactions or interact with other drugs. For example, senna (*Cassia acutifolia*) and germander (*Teucrium polium*) can induce hepatotoxicity⁴. Although in traditional medicine, *Cassia* species have been well known for their laxative and purgative properties and the treatment of skin diseases,^[5] there is now an increasing body of scientific evidence demonstrating that the plants possess many other beneficial properties.^[4] *Cassia sophera* Linn. (Caesalpinaceae) known as 'Kasondi' is an important drug of the Islamic System of Medicine (Unani Medicine). The plant is found throughout India^[5] and in most tropical countries.^[6] It is common in wastelands, on roadsides, and in the forests.^[7] Root bark is used for the preparation of the medicine. Ancient Indian physicians have used it for its efficacy in respiratory disorders.^[8] According to the physicians of Unani medicine, three plants viz., *Cassia occidentalis* Linn., *Cassia sophera* Linn. and *Cassia sophera*, Linn. Var. *purpurea*, Roxb. are varieties of 'Kasondi' and are invariably used in similar pathological conditions. 'Kasondi' is described in Unani literature to be repulsive of morbid humor, 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 ethnobotanical literature, it is mentioned to be effective in the treatment of pityriasis, psoriasis, asthma, acute bronchitis, cough, diabetes and convulsions of children. The chemical analysis of seed of *Cassia sophera*, Linn. revealed the presence of ascorbic acid, dehydroascorbic acid, and β -sitosterol. Still, no scientific^[9] study is reported on the varietal level of the plant.

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The fruits (pod) and the flowers of *Cassia sophera* Linn. are shown in Figures 1 and 2.

Botanical Description

Plant Characters	
Habitat	Hill Plant, Plainland
Plant type	Shrub
Foliage	Evergreen
Roots	Deep roots, Taproots
Type of stem	Soft wooded
Leaf type	Lanceolate, Oblong, Pinnate compound
Leaf arrangement	Alternate distichous
Leaf color	Green
Leaf surface	Glabrous
Plant height	Very small (0-5 meters)
Plant utilities	Industrial/commercial



Figure 1: *Cassia sophera* fruits



Figure 2: Flowers of *Cassia sophera*

Phytochemistry

A new anthraquinone diglycoside has been isolated from *Cassia sophera* root bark and characterized as 1,8-dihydroxy-2-methyl anthraquinone 3-neohesperidoside along with sitosterol, chrysophanol and physcion.^[10] From the heartwood of *Cassia sophera* two new isomeric anthraquinones, 1,2,7-trihydroxy-6,8-dimethoxy-3-methyl and 1,2,6-trihydroxy-7,8-dimethoxy-3.^[11] Two new anthraquinones have been isolated from the root bark of *Cassia sophera* and characterized as 1,8-dihydroxy-3,6-dimethoxy-2-methyl-7-vinylanthraquinone and 1,3-dihydroxy-5,7,8-trimethoxy-2-methylanthraquinone.^[12]

PHARMACOLOGICAL ACTIVITIES

Analgesic Activity

The central analgesic^[13] action of the seeds of *Cassia sophera* studied by Eddy's and Leimbach using hot plate and method of Davis using Analgesimeter showed strong analgesic effect most probably of opioid type as the positive effect against the thermal nociceptive stimuli are indicative of opioid type of analgesic effect.^[13]

Anticonvulsant Activity

Anticonvulsant action of the ethanolic extract of the seeds of *Cassia sophera* studied by Maximum electroshock-induced seizures model and Pentylentetrazol induced seizure test. In maximum electroshock-induced seizures test, the mean duration of the extensor phase of the test group was reduced to a significant level as compared to the control group. In Pentylentetrazole induced seizure test, the onset of myoclonic spasm and clonic convulsion was delayed in the test animals as compared to controlled thereby showing antiepileptic effect. The death rate was 100% in both the test and control groups, while, in a test, group the test group animals survived up to 45 minutes pentylentetrazole injection. This demonstrates very striking and potent antiepileptic activity in the test drug that may be useful in both types of epileptic conditions viz., grand mal and petit mal epilepsy.

Antioxidant Activity

The hydroalcoholic extract of *Cassia sophera* was screened for antioxidant activity using DPPH free radical scavenging model where it shows excellent antioxidant potential as compared to standard Ascorbic acid.

Anti-Inflammatory Activity

Cassia sophera has both peripheral and central analgesic properties. Its peripheral analgesic activity was deduced from its inhibitory effects on chemical-induced nociceptive stimuli. The acetic acid-induced abdominal contractions elucidate peripheral activity while the formalin test investigates both. Acetic acid causes increase in prostaglandins such as PGE2 and PGF2, serotonin, and histamine in the peritoneal fluid, which brings about characteristic writhing in mice. Drugs that primarily act on the central nervous system inhibit both phases equally while peripherally acting drugs inhibit the last phase.^[16] The formalin test is a very useful method for not only assessing antinociceptive^[17] drugs but also helping in the elucidation of the action mechanism. The neurogenic phase is probably a direct result of stimulation in the paw and reflects centrally mediated pain with the release of substance P while the late phase is due to the release of histamine, serotonin, bradykinin, and prostaglandins. Ethanolic extract of leaves of *Cassia sophera* blocks both the phases of formalin response but effect was more prominent in second phase.^[18]

Hepatoprotective Activity

The ethanolic extract of leaves of *Cassia sophera* could effectively control the AST, ALT, ALP, and total bilirubin levels and increase the protein levels in the protective studies. The histopathological studies substantiated the activity of the drug.^[19] This scientifically supports the usage of this plant in traditional medicine for the treatment of liver disorders and as a tonic.^[20]

Antiasthmatic Activity

Cassia sophera leaves possess significant antiasthmatic activity which can be attributed due to its bronchodilating, antihistaminic, antiallergic, adaptogenic and anti-inflammatory activity suggestive of its potential in prophylaxis and management of asthma.^[21]

Hypoglycemic Activity

The antidiabetic principles present in ethanolic extract (90%) of the leaves of *Cassia sophera* exhibits significant hypoglycemic activity by increasing peripheral glucose. The antidiabetic activity may be due to β -cell restoration of pancreas against streptozocin induce damage.^[22] It also has an antilipidemic activity. The investigation validates the use of *Cassia sophera* as a herbal drug for antidiabetic and antilipidemic activity.^[23]

CONCLUSION

Cassia sophera leaves possess antiasthmatic activity, hepatoprotective activity, anti-inflammatory activity, antidiabetic, and antioxidant activity. Seeds of *Cassia sophera* possess anticonvulsant and analgesic activity, and the mucilage obtained from the seeds is used as a binder in tablet formulations. In a nutshell, *Cassia sophera* Linn. is a miracle herb with so many pharmacological potentials. More studies are still needed on every part of the drug so that exact mechanisms of action can be framed on the basis of more accurate findings.

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