

ETHNOBOTANY, PHYTOCHEMICAL AND PHARMACOLOGICAL PROFILE OF
CASSIA TORA: A REVIEW ARTICLEDr. Sandeep Malik*¹ Dr. Jagdish Mohan Onkar² and Dr. Pratibha³¹PG Scholar Deptt. of Dravyaguna Vigyan.²Associate Professor Deptt. of Dravyaguna Vigyan.³Assistant Professor Deptt. of Dravyaguna Vigyan.

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ABSTRACT

Cassia tora Linn is a small annual herbs or undershrub growing as common weed in Asian countries. It is found as a weed throughout India. The plant which is used in several traditional medicines to cure various diseases. This weed has been known to possess antiproliferative, hypolipidemic, immunostimulatory, anticancerous, antimutagenic and hepatoprotective activity. A wide range of chemical compounds including anthraquinones, chrysofanol, emodin, rhein, euphol, basseol, palmatic, isostearic, behenic acid etc. have been isolated from this plant. The presented review summarizes the information concerning the botany, ethnopharmacology, phytochemistry, biological activity and toxicity of the Cassia tora plant.

KEYWORDS: Cassia tora Linn., Pharmacology, Phytochemistry, Toxicology, Medicinal plants.**1. OCCURRENCE, BOTANICAL DESCRIPTION AND ETHNOPHARMACOLOGY**

Cassia tora Linn. (Caesalpinaceae) is a small annual herbs or undershrub growing as common weed in Asian countries. It is found as a weed throughout India, universally in wild state in Himachal Pradesh, Bihar, and Orissa. Constitutes an Ayurvedic preparation “Dadhughnavati” which is one of the successful antifungal formulations. The herbs 1.2 m in height, Leaves compound, paripinnate, leaflets 3-pairs. Flowers bright yellow, usually in pairs, axillary. Pods long, slender, obliquely septate, 15-25 cm long. Seeds rhombo-hedral, green. It is a well known Ayurvedic medicinal plant as a laxative, antiperiodic and is useful for leprosy, ringworm, bronchitis and cardiac disorders, ophthalmic, skin diseases, cough, hepatic disorder, liver tonic, haemorrhoids. It was reported that seeds of CT has antioxidant activity and contain many active substances including chrysofanol, emodin, rhein etc. Many medicinal properties such as antimicrobial, antihepatotoxic and antimutagenic activities have been attributed to this plant

2. Phytochemistry**2.1 Seeds**

The seeds of Cassia tora L. (Leguminosae), Juemingzi in Chinese, are a famous traditional Chinese medicine and are listed in the Chinese Pharmacopoeia. It has been used to improve visual acuity and is reputed for its medical

value as an antimicrobial, antidiuretic, antidiarrhoeal, antioxidant, antihepatotoxic and antimutagenic. The bioactive constituents of this herb are anthraquinones including 1-desmethylaurantio-obtusin, 1-desmethylchryso-obtusin, aurantio-obtusin, chryso-obtusin, obtusin, etc. Five anthraquinones including aurantio-obtusin, 1-desmethylaurantio-obtusin, chrysoobtusin, obtusin, and 1-desmethylchryso-obtusin were isolated and purified by high-speed counter-current chromatography and semipreparative high-performance liquid chromatography from Cassia tora Linn. From the seeds of Cassia tora, an anthraquinone glucoside was isolated and characterized as alaternin 2-O- β -D-glucopyranoside.

The seeds of Cassia tora contain a variety of bioactive anthraquinones (AQs) substances, including chrysofanol, emodin, rhein. This mainly responsible for pharmacological action ascribed to them. Reported that AQs aglycons from Cassia tora exhibited inhibitory effect against aflatoxin B1 in the Ames test. Several reports shown that AQs can act as antimutagens, which suppress the mutagenicity of mycotoxins, polycyclic aromatic hydrocarbons and HCAs. Cassia tora extracts were found to promote hepatic enzymes in rats with ethanol-induced hepatotoxicity, including catalase, superoxide dismutase and glutathione peroxidase. More recently, ethanolic extracts of Cassia tora have been reported to have hypolipidic activity in Wistar rats.

WECT also modulated the oxidative DNA damage in human lymphocytes induced by hydrogen peroxide as evaluated by the Comet assay revealed that the major antioxidant compound of *Cassia tora* was isolated and identified as emodin.

2.2 Leaves

Ononitol monohydrate, structurally similar to glycoside was isolated from *Cassia tora* Linn. leaves.

3. Pharmacological Profile

Cassia tora Linn is a medicinal plant traditionally used as laxative, for the treatment of leprosy and various skin disorders. The phytochemical analysis of leaf showed the presence of polyphenols. The presence of phenolic compound prompted us to evaluate its antioxidant and antiproliferative potential.

3.1 Nitric Oxide Scavenging Activity

The methanolic leaf extract of *Cassia tora* was evaluated for its nitric oxide scavenging activity and reducing power assays using Rutin and BHT as standards. The extract was studied for its lipid peroxidation inhibition assay using rat liver and brain.

3.2 Antiproliferative Activity

The antiproliferative activity of *Cassia tora* methanolic leaf extract with Cisplatin, anticancer drug was studied using human cervical cancer cells

3.3 Hypolipidemic Activity

Ethanol extract of seeds of *Cassia tora* L. and its fractions were investigated for hypolipidemic activity on triton induced hypersoluble fraction decreased serum level of total cholesterol by 42.07, 40.77 and 71.25%, respectively. On the other hand ethanol extract, ether soluble fraction and water soluble fraction increased the serum HDL-cholesterol level by 6.72, 17.20 and 19.18%, respectively. Ethanol extract, ether fraction and water fraction decreased triglyceride level by 26.84, 35.74 and 38.46%, respectively. The reduction in LDL cholesterol level by ethanol extract, ether soluble fraction and water soluble fraction were 69.25, 72.06 and 76.12%, respectively.

3.4 Antigenotoxic properties

Antigenotoxic properties and the possible mechanisms of water extracts from *Cassia tora* L. (WECT) treated with different degrees of roasting (unroasted and roasted at 150 and 250°C) were evaluated by the Ames Salmonella/ microsome test and the Comet assay.

RESULTS

Indicated that WECT, especially unroasted *C. tora* (WEUCT), markedly suppressed the mutagenicity of 2-amino-6-methylidipyrido (1, 2-a: 3V:2V-d) imidazole (Glu-P-1) and 3-amino-1, 4-dimethyl-5H-pyrido (4,3-b) indole (Trp-P-1). In the Comet assay performed on human lymphocytes, WECT exhibited significant protective effect on Trp-P-1-mediated DNA damage

followed the order of unroasted (55%) N roasted at 150°C (42%) N roasted at 250°C (29%). Pre-treatment of the lymphocytes with WEUCT resulted in 30% repression of DNA damage. However, no significant effect on excision-repair system was found during DNA damage expression time in post-treatment scheme (p<0.05). Water extracts from *Cassia tora* showed 84% scavenging effect on oxygen free radicals generated in the activation process of mutagen detected by electron paramagnetic resonance system.

Two possible mechanisms were considered

- (1) Neutralization the reactive intermediate of Trp-P-1; and
- (2) Protecting cells directly as an antioxidant that scavenge the oxygen radicals from the activation process of mutagen. The individual anthraquinone content in extracts of *Cassia tora* was measured by HPLC. Three anthraquinones, chrysophanol, emodin and rhein, have been detected under experimental conditions. The anthraquinone content decreased with increased roasting temperature. Each of these anthraquinones demonstrated significant antigenotoxicity against Trp-P-1 in the Comet assay. In conclusion, our data suggest that the decrease in antigenotoxic potency of roasted *C. tora* was related to the reduction in their anthraquinones.

4. CONCLUSION

Potential of this plant. It is strongly believed that detailed information as presented in this review on the phytochemical and various biological properties of the extracts might provide detailed evidence for the use of this plant in different medicines. The phytochemical variations and efficacy of the medicinal values of *C. tora* is dependent on geographical locations and seasons. There is a demand to standardize the toxic properties of *Cassia tora* and their detailed clinical trials. After proper processing, identification and removal of the harmful properties of leaves, they may be utilized to prepare a good, Ayurvedic Formulations and Preparations. At the same time, the organic and aqueous extract of *Cassia tora* could be further exploited in the future as a source of useful phytochemical compounds for the pharmaceutical industry.

8. REFERENCES

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