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Preliminary Screening of Phytochemicals and Evaluation of Laxative Activities in Aqueous Leaf Extract of *Cassia tora* Linn



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ABSTRACT

The objective of the study was the preliminary screening of *Cassia tora* leaf extracts for various phytochemical constituents and all so to evaluate the laxative activity. The leaf extracts were subjected to phytochemical screening to detect the presence of various group of phytoconstituents by carrying out the different chemical analysis and the laxative activity of the aqueous extract was study at dose of (100, 200 & 400) mg/kg against the standard drug sodium picosulfate in a dose of 5mg/kg. The preliminary studies revealed the presence of alkaloids ,flavonoids, tannins, saponin and phenols in aqueous leaf extracts of *C.tora* and the effects of *C.tora* leaf extract at doses of 100,200 and 400 mg/kg (*p.o.*) increased significantly fecal output of rats was compared to control group .The effect of the extract at the dose of 400 mg/kg (*p.o.*) was similar to that of the standard drug sodium picosulfate (5 mg/kg, *p.o.*). The result of the present study indicates that the presence of phytoconstituents like alkaloids, flavonoids and phenols either individually or combined may exhibit the therapeutic potentials of leaves of *Cassia tora*.

INTRODUCTION:

Laxative are a group of medicine that are used for treating constipation. mostly laxative s act by increasing the amount of water in the stools, this softens the stool mass and facilitates the movements of bowel contents through the intestines.[1]. *Cassia tora* is a small shrub with a wide geographical distribution as a weed in nearly all the Asian countries. Plant belongs to Family Leguminosae that is also known as Pea or bean family that is large and having economic importance in flowering plants flowers are found in pair with five petals and pale yellow in colour, pods are 10-15cm long and sickle shaped and 30-50 seeds are present in a pod, [2]. *Cassia tora* (in oriya Chakunda) is used in traditional medicine as a laxative, antiseptic, antioxidant activity, antiperiodic and all so useful in treatment of leprosy, ringworm, bronchitis, cardiac diseases, hepatic disorder, liver tonic, hemorrhoids, and ophthalmic, skin diseases[3] These herbs have been describes for their usefulness in the profile of decoctions, infusions and tinctures in traditional system of medicines for treating skin diseases like psoriasis, leprosy etc.[4]. Decoctions of parts of *Cassia tora* is used as an analgesic, anticonvulsant, antipyretic, antifungal, diuretic, expectorant, laxative, purgative, treatment of glaucoma and hypertension, treatment of skin disease, ringworm and itch [5]. *Cassia tora* has been stated to contain many active constituents, including Anthraquinones, emodin, rhein, quercetin, chrysophenol etc [6]. Review of the literature revealed that though this plant is known for several pharmacological activities, an attempt has been made to evaluate the laxative activity of leaves part of this plant.

MATERIALS AND METHODS

Collection and identification plant material

The leaves were collected from the tribal belts of the local area of Rondapalli, Koraput district in month of October 2020. The plant was identified, confirmed and authenticated by the Biju Patnaik Medicinal Plants Garden and Research Centre, Dr. M. S. Swami Nathan Research Foundation, Jeypore, Koraput (District), Odisha (Letternno.MJ/SS/P-406/20, dated (18.10.2020). After authentication the leaf were collected in bulk and shade dried. The dried materials were made into coarse powder and stored in a closed airtight container for further use.

Preparation of Plant extract

About 500g of leaf powdered sample of *Cassia tora* was weighted and add in a container then approximately two liters of distilled water was added, the mixture was boiled for 45 minutes and the solution of the extract was allowed to cool and filter then transferred in to a flask for further used.[7].

Preliminary Phytochemical Screening:

The leaf extracts of *Cassia tora* were subjected to preliminary phytochemical screening to detect the presence of various groups of phytoconstituents by carrying out the different chemical analysis. [8].

Experimental animals

Animal:

Healthy adult Wister strain of albino rats weighing approximately 120 to 150 gm were used. They were housed in standard conditions of temperature (25 ± 2 °C), 12 h light per day cycle relative humidity of 45-55 % in the animal house of Jeypore College of Pharmacy. They were fed with standard pellets of food and water. Animals were kept, and all operation on animals was done in aseptic condition.

Experimental Protocol:

Animals were selected, weighed and divided into five groups (n=6), namely control, standard drug, and three test groups belonging to *Casia tora* leaf extracts. The studies conducted were approved by the Institutional Ethical Committee of regd.no.(1906/PO/Re/S/16/CPCSEA), according to prescribed guidelines of the Committee for Control and Supervision of Experiments on Animals (CPCSEA), Government of India.

Acute toxicity study

The acute toxicity study was performed by using albino rats to determine the dose. The animals were fasted overnight prior to the acute experimental procedure. The animal is given the limit dose 2000mg/kg, the extract showed no sign of toxicity, erected furs and slight diarrhea during the first 4 hours. Further, no animal died in the 14 day follow up.[9].

Laxative activity

The test was performed according to Capasso *et al* 1986. The animals were divided into five groups of six rats. The first groups of animals, serving as control, received normal saline {5 (mL/Kg,*p.o*), second group ,serving as reference standard drug , received sodium picosulfate (5mg/ kg,*p.o*) in saline, the third, fourth and fifth groups received 100,200 and 400 mg/kg per os of the *Cassia tora* aqueous extract. Immediately after dosing, the animals were separately placed in cages suitable for collection of feces. (Each cage is with a wire mesh at the bottom and a funnel to the urine, stainless-steel sieves are placed in the funnel to retain feces). After 8h of drug administration, the feces were collected and weighed. Thereafter, food and water were given to all rats and faecal outputs were again weighed after a period of 16 h.[10,11,,12].

Statistical analysis

All results are expressed as mean \pm standard error. The data was analyzed using two ways of analysis of variance (ANOVA). The statistical significance of the difference of the means was evaluated by Dunnet's test.[13].

Table 1: Preliminary phytochemical screening of aqueous leaf extract of *Cassia tora*.

Sl.no.	Screening	Aqueous leaf extract
1.	Alkaloids test	+
2	Glycosides test	++
2.	Flavonoid test	++
3.	Tannins test	+
4.	Saponin test	+
5.	Carbohydrate test	-
6.	Terpenoids test	-
7.	Phenolic compounds test	++

++, moderately present, +, poor present, -, absent

Table 2: Laxative activity of aqueous leaf extract of *Cassia tora*

Treatment	Dose	Faecal output (g)	
		8 hours	8-16 hours
Control	5mg/kg	0.471 ±0.41	1.603 ± 0.65
Sodium picosulfate (standard)	5 mg/kg	4s.031 ± 1.112**	5.412±0.61**
CAR	100 mg/kg	0.891 ± 0.16	1.197± 90.25
CAR	200 mg/kg	3.701± 0.73*	4.733 ±0.110*
CAR	400 mg/kg	4.826 ±0.91**	5.214 ± 0.57**

Values are expressed as mean ± S.E.M (n = 5); * p < 0.05 compared to control group; and **p < 0.01 compared to control group.

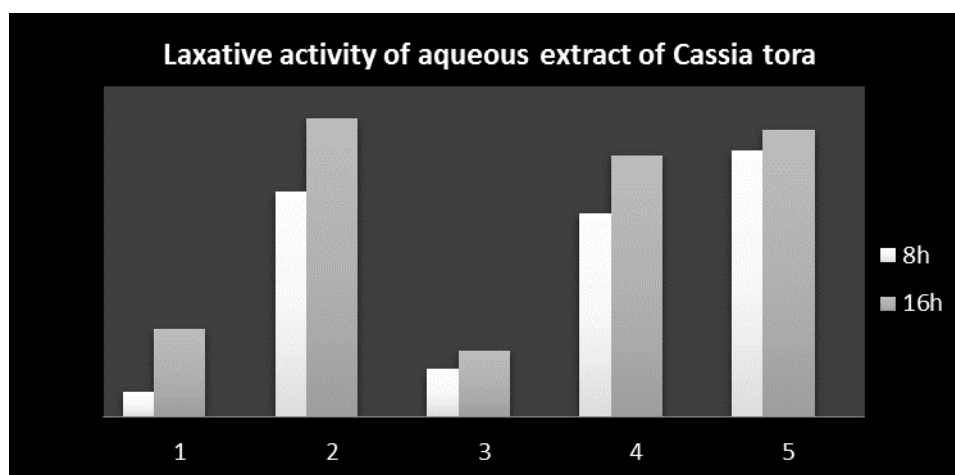


Fig no 1: Laxative activity of aqueous extract of *Cassia tora*

1: Normal control, 2: Standard (Sodium picosulfate), 3: CAR ext.100mg/kg ,4: CAR ext.200mg/kg, 5 CAR ext.400mg/kg

RESULT AND DISCUSSION

The preliminary phytochemical screening showed that the aqueous extract of the leaf of *Cassia tora* contain alkaloids, flavonoids, tannin, saponin and phenolic compounds, whereas glycoside, carbohydrate and terpenoids were absent and all so preliminary acute toxicity study in mice reveled that all the extracts were not toxic (LD50 > 2000mg/kg). The laxative activity were studied by using aqueous extracts of leaf of *Cassia tora*. There was no

significant difference between the extract at the dose of 100 mg/kg (*p.o.*) and control group. The effects of *C. tora* at doses of 200 and 400 mg/kg (*p.o.*) increased significantly fecal output of rats as compared to control group. The effect of the extract at the dose of 400 mg/kg (*p.o.*) was similar to that of the standard drug sodium picosulfate (5 mg/kg, *p.o.*) which were shown in (Table no.-2 and Fig no-1).

CONCLUSION

The result of present study indicates that the presence of phytoconstituents like alkaloids, flavonoids and phenols either individually or combined may exhibit the therapeutic potentials of leaves of *Cassia tora* and it all so concluded that the traditional use has been pharmacologically validated and the *Cassia tora leaf* can be use as substitute of synthetic laxative having adverse effect.

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