Studies on some Pharmacognostic profiles of Cassia tora Linn. Leaves

TAPANKUMAR MAITY¹, SUBHAS CH. MANDAL², B.P. SAHA² AND M.PAL²

¹ College of Pharmaceutical sciences, Mohuda, Berhampur, Orissa
² Department of Pharmaceutical Technology, Faculty of Engineering and Technology, Jadavpur University, Calcutta 700 032

ABSTRACT: The macroscopic character of the leaves, physical constant values, extractive values, behavior on treatment with different chemical reagents. Fluorescence characters under ultraviolet light after treatment with different chemical reagents of the powdered leaves of Cassia tora Linn. (Family: Leguminosae) were studied to characterize some pharmacognostical parameters. Preliminary phytochemical study on different tracts of the leaves were also performed.

INTRODUCTION

Cassia tora Linn (Family. Leguminosae) is an annual undershurb grows all over the tropical Asian countries and grows well in wasteland. It is commonly known as ‘Sicklepod’. Various medicinal properties have been attributed to this plant in the traditional system of Indian medicine. Different parts of the plants were reputed for their medicinal value¹. The seeds of cassia tora have been used in Chinese medicine as aperient, antiasthmatic and diuretic agent and also improve the visual activity²,³. The leaves of cassia tora contain several anthraquinone glycosides which are well now for their therapeutic value. The extracts of cassia tora leaves showed purgative action⁴. The leaves extract of this plant have been reported to have significant antifungal activity.⁵ The plant is also reported to have a significant hepatoprotective effect against the toxicity of carbontetrachloride in rats⁶. The plant has been used as laxative and in treatment of skin disorder⁷,⁸,⁹ cassia tora leaves have been reported to have antirheumatic activity in folklore practices⁷.

The present investigation deals with the studies on some important pharmacognostical properties of the leaves as a whole and its powdered form.

MATERIALS AND METHODS

Plant Materials

Cassia tora herbs were collected from Berhampur, Orissa, India and identified by Botanical survey of India Shibpur, Howrah India. A voucher specimen (C-03) as been kept in our laboratory for future references. The leaves were picked up and dried under shed, powdered and passed through 40 mesh sieve and stored in a closed vessel of future use.
**Reagents**

All the reagents were of analytical grade and obtained from S.D fie chemicals Ltd, Mumbai.

**Methods**

The macroscopic character (colour odour, size shape taste, surface, texture) of the leaves were observed\(^{10}\). The ash values of leaves were determined by pharmacopoeial metods\(^{11}\). The alcohol (90%) soluble and water soluble extractives were determined by maceration process. Other extractive values were determined successively starting form petroleum their (60-80\(^o\)) benzene, chloroform, acetone and methanol as a solvent b using soxhlet extraction apparatus, the dried extractive were obtained after evaporation of solvent under reduced pressure, the behavior of the powdered leaves wit different chemicals reagents were studied and the florescence characters also observed under ultraviolet light at 254 nm\(^{12}\). Preliminary phytochemical tests of different extractives were performed by specific reagents\(^{13,14}\).

**RESULTS AND DISCUSSION**

The macrocopic characters are sown in table -1 the physical constant values include total as, acid insoluble ash, alcohol (90%) and water soluble extractive are reported in Table 2 The water soluble extractive is more as compared with alcohol (90%) soluble extractive. The extractives values obtained after successive extraction is reported in Table -3 The been extract shows minimum, whereas methanol extract shows minimum extractive value. The results of preliminary phytochemical tests for the presence of active constituents is reported in Table -4 It is confirmed that leaves contain reducing sugar, tannin sterol and anthraquinone glycosides. The behavior of the powdered leaves on treatment with different chemical reagents and the fluorescence character of the same under ultraviolet light is sown in table 5 and table -6 respectively.

| Table 1- Macroscopic character of C. tora Linn Leaves |
|-----------------|--------------------------------------------------|
| Colour          | The fresh leaves are green in colour, dried leaves are dull green in colour |
| Odour           | Disagreeable                                    |
| Size            | Leaves are distinctly petioled, furnished with glands on the main rachis between the leaflets (4.5 cm long). Rachis is grooved, more or less pubescent with a conical gland between one of the two lowest pairs of leaflets, stipules 1.3 to 2 cm long. Linear sabulate, caducus. Leaflets are 3 pairs, ovate-oblong, perfect, glaucous, membranous opposite 2.5 to 4.5 cm by 1.3 to 2.5 cm (the lowest pair is the smallest). Flowers are usually in nearly sessile pairs in axils of the leaves, upper ones are very crowded. Corolla are small, bright orange yellow in colour, sepals are concave, stamens are subequal. Pods are subterete or 4 angled, very slender, falcate 6-12 inch long, incompletely septate, membranous with numerous brown oblong seeds 0.12 inch long. The seeds are unisteriate. |
| Shape           | The leaves are conical at one end ovate, oblong, perfect glaucous. |
Surface | Smooth, sign of shrinkage after drying
Fracture | Brittle and powdery

### Table 2 – Physical constant values of the *C. tora* Leaves

|                          | Percentage* |
|--------------------------|-------------|
| Total ash 11.61%         |             |
| Acid insoluble ash       | 1.820%      |
| Alcohol (90%) soluble extractive | 11.74%  |
| Water soluble extractive | 12.51%      |

### Table 3- Extractive Values of *C. tora* Leaves and their colours

| Solvents               | Percentage of extractive values | Colour of extractive   |
|------------------------|---------------------------------|-------------------------|
| Petroleum ether (60-80°C) | 1.270                          | Greenish brown          |
| Benzene                | 0.790                           | Greenish brown          |
| Chloroform             | 1.210                           | Green                   |
| Acetone                | 3.250                           | Deep brown              |
| Methanol               | 6.560                           | Brownish Black          |
| Alcohol                | 5.640                           | Brown                   |

### Table 4- Preliminary phytochemical tests for the presence for active constituents in *C. tora* Leaves

| Extract           | Alkaloid | Reducing Sugar | Tannin | Flavonoid | Sterol | Saponin | Anthraquinone |
|-------------------|----------|----------------|--------|-----------|--------|---------|---------------|
| Petroleum ether   | -        | -              | -      | +         | +      | -       | +             |
| Benzene           | -        | -              | -      | +         | +      | -       | +             |
| Chloroform        | -        | -              | -      | +         | +      | -       | +             |
| Acetone           | -        | +              | +      | -         | +      | -       | +             |
| Methanol          | -        | +              | +      | -         | -      | +       | -             |
| Alcohol           | -        | +              | +      | -         | -      | -       | -             |
| Water             | -        | +              | +      | -         | -      | -       | -             |

‘+’= Present; ‘-‘= Absent
Table 5- Behavior of the powdered Leaves of *C. tora* on Treatment with different Reagents

| Reagents                          | Colour of Powder   |
|----------------------------------|--------------------|
| Picric acid (Saturated aqueous solution) | No change          |
| Nitric Acid (Specific gravity 1.42)   | Reddish brown      |
| Hydrochloric acid (Specific gravity 1.16) | Greenish yellow  |
| Sulphuric acid (80%)              | Brownish red       |
| Glacial acetic acid               | Grey               |
| Sodium hydroxide (5N aqueous solution) | Yellow           |
| Iodine (aqueous solution)         | Black              |
| Ferric chloride (aqueous solution 5%) | Green              |
| Antimony trichloride              | Light green        |
| Powder as such                    | Greyish white      |

Table-6- Fluorescence Characters of the powdered leaves of *C. tota* under ultra violet light

| Treatment                                              | Fluorescence         |
|--------------------------------------------------------|-----------------------|
| Powder mounted with nitrocellulose                    | Greyish white         |
| Powder treated with sodium hydroxide                   | Grey                  |
| Powder treated with sodium hydroxide in methanol dried and mounted with nitro cellulose | Yellowish green |
| Powder treated with hydrochloric acid                  | Grey                  |
| Powder treated with hydrochloric acid dried and mounted with nitro cellulose | Greenish Yellow |
| Powder treated with sodium hydroxide in water          | Yellow                |
| Powder treated with sodium hydroxide in water dried and mounted with nitro cellulose | Brown |
| Powder treated with nitric acid diluted with equal volume of water | Blue |
| Powder treated with sulphuric acid diluted with equal value of water | Light purple |
| Powder as such                                         | Dull green            |

REFERENCE:

1. Nadkarni K.M., Nadkarni A.K. and Chopra R.N., *Indian Materia Medica*, Popular Prakashan, Bombay, Vol I, 291 (1954)

2. Kirtikar K.R. and Basu B.D., *Indian Medicinal Plants*, ed. By Blatter J.E. Caius and K.S. Mahasker. Bishen Singh Mahendra Pal singh, Dehra Dun Vol-LL, 878-879 (1975)

3. Asolkar L.V. Kakkar K.K. and Chakre O.J., *Second supplement to Glossary of Indian Medicinal Plants*, PID, CSIR, New Deli, 180-181 (1992)
4. Pal M, Roy D.K. and Pal P.R. Emodin from the leaves of *Cassia tora* Linn, Indian J Phrm, 39(5), 116-117 (1977)

5. Mukherjee P.K, Saha K. Das J, Saha B.P., Pal M. Antifungal activity of the leaf extract of *Cassia tora* Linn (Family-Leguminosae) Phytother Res Vol 10, 521-522 (1996)

6. Maity T.K. Mandal S.C., Mukherjee P.K. saha K.Das, Saha B.P. and Pal M. Evolution of Hepatoprotective potential of *Cassia tora* leaf Extract, Nat Pro scs.. 32 (in press) (1997).

7. Hooker J.D. *The Flora of British India* L. Reeve and Co., England, Vol II 26 (1879).

8. Chatterjee A. and Pakrashi S.C *The Treatise on Indian Medicinal Plants*, PID , Csir, New Deli Vol 2,44-45 (1992).

9. Jain S.K. *Medicinal Plants*, National Book Trust, India (1968).

10. Wallis T.E. *Text Book of Pharmacology* 3\textsuperscript{rd} Edn., CBS Publishers and Distributors, Deli (1985)

11. The *Indian Pharmacopoeia* 2\textsuperscript{nd} edh Govt., of India Publication, Delhi, 947-948 (1966).

12. Raghunathan K. and Mitra R. *Pharmacognosy of Indigenous Drugs*, central council for research in Ayurveda and siddha, New Delhi, Vol I & II (1982).

13. Trease G.E. and Evans W.C. *Pharmacognosy*, 9\textsuperscript{th} Edn., ELBS Publication (1985)

14. Tyler V.E., Brady L.R., Robbers J.E. *Pharmacognosy*, 9\textsuperscript{th} Edn., Lea & Febiger Publication, Philadelphia (1985).