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PHARMACOGNOSTICAL AND PHYTOCHEMICAL INVESTIGATION ON LEAVES OF *CASSIA OBTUSIFOLIA* LINN.

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ABSTRACT
The present study deals with the macroscopical and microscopical studies on leaves of *Cassia obtusifolia* Linn. Some distinct and different characters were observed with section of young thin leaves. The anatomy of the leaves was studied by taking transverse section of midrib. The chloroplasts are much more concentrated in the palisade layer of the mesophyll. There is only one large vascular bundle in the midrib. The midrib was stained with toluidine blue. This helps to resolve the vascular tissues with greater certainty. The xylem and phloem were also observed. Powder microscopical examination showed the presence of parenchyma cells, xylem fibres and starch grain. Physiochemical parameter and preliminary phytochemical study of the leaves powder were also carried out.
KEYWORDS: *Cassia obtusifolia* Linn., Leaves

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INTRODUCTION

Cassia obtusifolia Linn. (Fabaceae) is an annual herb or under shrub, 0.5-2.0 m in height; Leaves are 7-15 cm long, with a conical gland between the lowest pair of leaflets. The tender leaves, twigs and young pods are cooked and eaten as potherb. The leaves are gently aperient distributed from Jammu Kashmir and Himachal Pradesh to West Bengal and in Orissa, Madhya Pradesh, Rajasthan, Gujarat and Maharashtra, up to an altitude of 1,200 m. It has been also reported from Andhra Pradesh, Karnataka and Tamilnadu.

It is well known as Marathi (Tarwatta) Rajasthan (Pumaria) Uttar Pradesh (Banarh), Mundari (Cakonda). Its leaves were used as ringworm, skin diseases, cough, cold, asthma, mild purgative, in liver complaints, vomiting, stomachache, headache and also applied to foul ulcers[1]. The plant contains anthraquinons, sterol, triterpenoids[2] and anthraquinons glycosides[3].

The objective of present studies was focused on Pharmacognostical and Phytochemical investigation on leaves of *Cassia obtusifolia* Linn. (**Figure 1**)

MATERIAL AND METHOD

Plant material

The plant specimen for the proposed study was collected from Dhule Dist. (M.S.) care was taken to select healthy plants and for normal organs. The plant was authenticated by Dr. P.G. Diwakar (Joint Director) of BSI, Pune (M.S.) Ref. No. BSI/WRC/TECH./2011. The required samples of different organs were cut and removed from the plant and fixed in FAA (Formalin – 5 ml + Acetic acid – 5ml + 70% Ethyl alcohol – 90ml). After 24 hrs of fixing, the specimen was dehydrated with graded series of tertiary – butyl alcohol as per method[4]. Infiltrations of the specimens were carried out by gradual addition of paraffin wax (melting point 58 – 60^{0}C) until TBA solution attained super-saturation. The specimens were casted into paraffin blocks.

Sectioning

The paraffin embedded specimens were sectioned with the help of rotary Microtome. The thicknesses of the sections were 10-12 µm. Dewaxing of the sections were done by customary procedure[5]. The sections were stained with toluidine blue[6]. Since toluidine blue is a polychromatic stain, the staining results were remarkably good; and some cytochemical reactions were also obtained. The dye rendered pink colour to the cellulose walls, blue to the lignified cells, dark green to suberin, violet to the mucilage, blue to the protein bodies etc.

Photomicrographs

Microscopical descriptions of tissues were supplemented with micrographs wherever necessary. For normal observations bright field were used. For the studies of crystals, starch grains and lignified cells, polarized light were employed. Since these structures have birefringent

property, under polarized light they appear bright against dark background[7].

Physicochemical Parameters

Physicochemical parameter such as total ash, acid insoluble ash, water soluble ash, sulphated ash, moisture content etc[8,9] of leaves of *Cassia obtusifolia* Linn. were determined.

Preliminary phytochemical parameters

Preliminary phytochemical study on leaves of *Cassia obtusifolia* Linn. was performed for the identification of active principles[10,11].

RESULTS AND DISCUSSION

Macroscopical studies

The leaves *Cassia obtusifolia* Linn are 7-15 cm long, with a conical gland between the lowest pair of leaflets. The tender leaves, twigs and young pods are cooked and eaten as potherb (**Figure 1**).

Microscopical studies

The microscopical studies on leaves of plant *Cassia obtusifolia* were performed to evaluate various parameters such as T.S. of leaf (**Figure 2**), stomatal no. stomatal index (**Figure 4**). The T.S. of leaf *Cassia obtusifolia* Linn. revealed some interesting results about the plants epidermal features. For example, epidermal trichomes could not be observed on both the upper and lower surfaces of the leaf. Microscopical examination of leaf revealed that the mesophyll is bifacial and consists of a highly organized palisade layer just under the epidermis and a spongy layer with much intracellular space occupying the area just under the palisade layer and just above the abaxial epidermis. The chloroplasts are much more concentrated in the palisade layer of the mesophyll. There is only one large vascular bundle in the midrib. The midrib was stained with toluidine blue. This helps to resolve the vascular tissues with greater certainty. The xylem and phloem were observed (Figure2).

Powder microscopy

The leaves of *Cassia obtusifolia* Linn. were also studied in the powder form to observe characters like starch, calcium oxalate crystals, fibres etc. This study showed presence of starch grains, lignified fibres and parenchyma cells. The result is given in (figure no. 3).

Physicochemical parameters

Powdered leaves of *Cassia obtusifolia* Linn. was used to find out various physicochemical parameters. The results of physicochemical study was found to be as Total ash 14% w/w, acid insoluble ash 3.66%w/w, water soluble ash 10.7% w/w, sulphated ash 7.69% w/w , alcohol soluble extractive 4.848 % w/w, water soluble extractive 20.96 % w/w and moisture content 7.204% w/w respectively.

Preliminary phytochemical studies

Ethanolic and aqueous extract of leaves of *Cassia obtusifolia* Linn. showed the presence of various Phytoconstituents such as glycosides, saponins, triterpenoids, tannins, flavanoids, alkaloids and carbohydrates.

CONCLUSION

The present Pharmacognostical and phytochemical study of leaves of *Cassia obtusifolia* Linn. may be useful to supplement assumed significantly in the way of acceptability of herbal drugs in present scenario that lacks regulatory laws to control quality of herbal drugs.

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Figure 1: *Cassia obtusifolia* Linn.

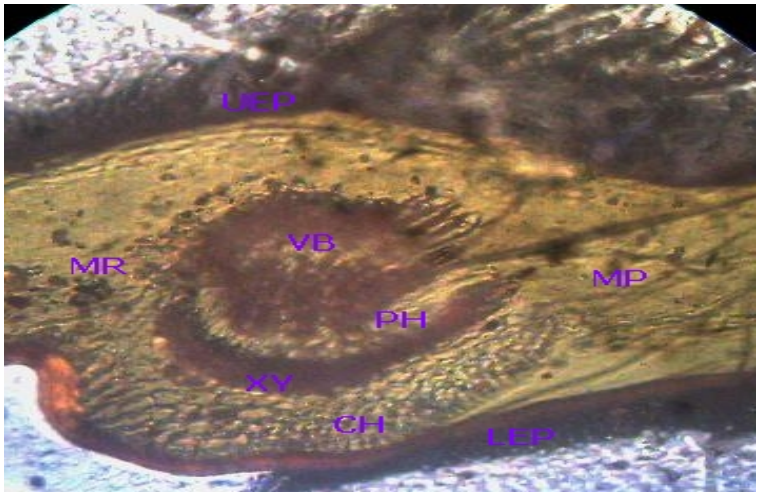

Figure 2: Microscopical study on leaf of *Cassia obtusifolia* Linn.
UEP - Upper epidermis, LEP - Lower epidermis, XY- Xylem
PH - Phloem, MP - Mesophyll, MR - Midrib, CH – Cholenchyma

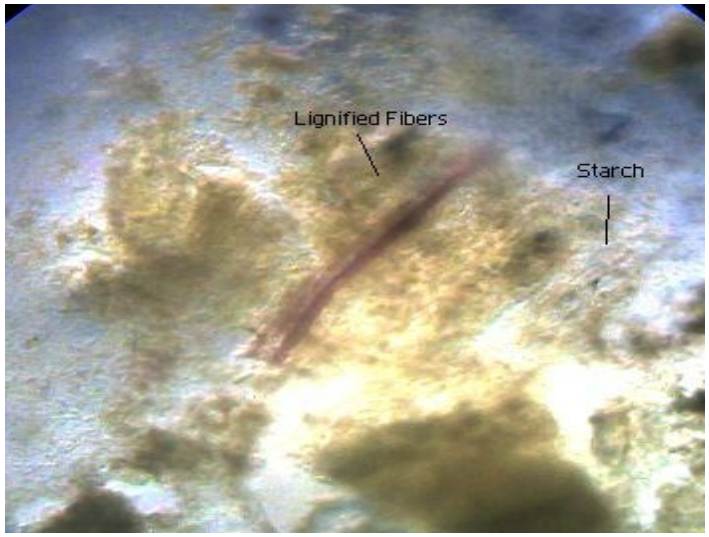

Figure 3: Powder microscopy

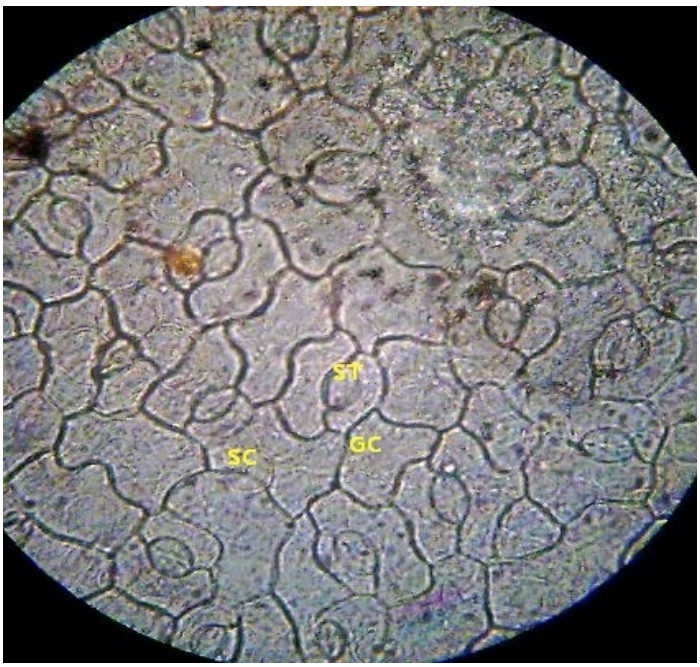

Figure 4: Surface preparation of leaf of *Cassia obtusifolia* Linn.
ST - Stoma, SC - Subsidiary cell, GC - Guard cell

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