



## Pharmacognostical and Phytochemical Investigation of stem bark of *Caesalpinia pulcherrima* (L.) Sw.

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**Abstract:** *Caesalpinia pulcherrima* (L.) Sw. is native and common throughout much of India, Burma, Madagascar and dry areas of Ceylon and is often grown in Bangladesh. The plant is traditionally used for treatment of diarrhoea, dysentery and certain skin diseases. Upon significant literature survey it was found that inadequate amount of information was found on the identification characters of the plant and hence pharmacognostical evaluation of the plant was carried out on the species to judge its use in pharmaceutical industry. Exploration of the available literature and existing information of the plant, reveals that the plant possesses some important biological activities. The main objective of this study was to evaluate the pharmacognostical properties of *Caesalpinia pulcherrima* (L.) Sw. (stem bark).

### 1. INTRODUCTION:

*Caesalpinia pulcherrima* (L.) Sw. (Family-Caesalpinaceae) is a medicinal plant which possesses important active principals that have special medicinal value and various parts of plants are traditionally use against a variety of diseases by the rural people. Common Names are *Krishnachura*, *Radhachura*, Peacock flower, Poinciana. It is usually a small to moderate sized tree or shrub growing to 3 to 5 m tall<sup>i</sup>. The leaves of *C. pulcherrima* are compound, with 8-12 pairs of oblong leaflets and small prickles. Flowers are yellow in terminal and axillary panicles, fruits are woody pods, sub compressed with a hard recurved short beak. Seed are 3- 4, yellowish-brown. Wood is orange-red, hard, very heavy (wt - 1.073 kg/m<sup>3</sup>, air dry), straight-grained with a fine texture<sup>ii</sup>. Plants belonging to the family Caesalpinaceae have wide range of medicinal uses; the wood is bitter, dry, sour, cooling; cures fever, delirium, ulcers, strangury, urinary concentration and blood complaints. It is considered astringent and sedative. It is useful in vitiated conditions of *Pitta*. An infusion of the wood is a powerful astringent and emmenagogue. It is used in atonic diarrhoea and dysentery, and its paste in rheumatism, haemorrhages and to treat wounds<sup>iii</sup>. The trunk wood possesses antibacterial, demulcent and haemostatic properties. It is used in contusion, wounds, dysmenorrhoea, colic furunculosis, impetigo, leucorrhoea and anaemia. The plant is one of the ingredients of an indigenous drug 'Lukol' which is administered orally for the treatment of non-specific leucorrhoea.<sup>iv</sup> Present study was conducted to establish the pharmacognostical identification parameters of the plant.

### 2. MATERIALS AND METHODS:

The plant material was collected when it was in full bloom in month of November, from places located around the Jamnagar and was washed thoroughly with running water to remove adherent soil, dirt etc and dried in shade. The arial portion was carefully separated and kept aside for the future investigation. Roots were cut into 1 to 2 cm long pieces, few were preserved in FAA (Formalin 90: Acetic acid 7: Alcohol 3) for microscopic investigation, and the remaining roots were made into 40# powder and stored in well closed containers away from light. Free hand sections were taken from the preserved materials of the root and observed as such under the microscope for the presence of ergastic cell contents and other contents.<sup>v</sup> The section was cleared with chloral hydrate and then was stained with phloroglucinol and hydrochloric acid to observe the lignifications of the cell wall if any.<sup>vi</sup> The histochemical tests were also performed to detect the location of various cell contents by using various reagents.

### 3. RESULTS:

#### Morphology:



Figure 1. : Plant



Figure 2. : Stem Bark Powder.

Transverse Section of the plant shows cork at the outermost part. Inner to that, wide cortex lined with stone cells, sclereids and patches is seen. This is then followed by wide phloem as shown in figure 3. The detailed TS of the bark shows outermost many layered transversely elongated parenchymatous cork. Wide zone of simple thin walled parenchymatous cortex often observed with scattered patches and a thick line of stone cells & sclereids; phloem wide traversed with medullary rays mostly uni to multi seriated & phloem cells (Figure 4). Prismatic crystals of calcium oxalate & simple & compound starch grains found throughout the section (Figure 5).

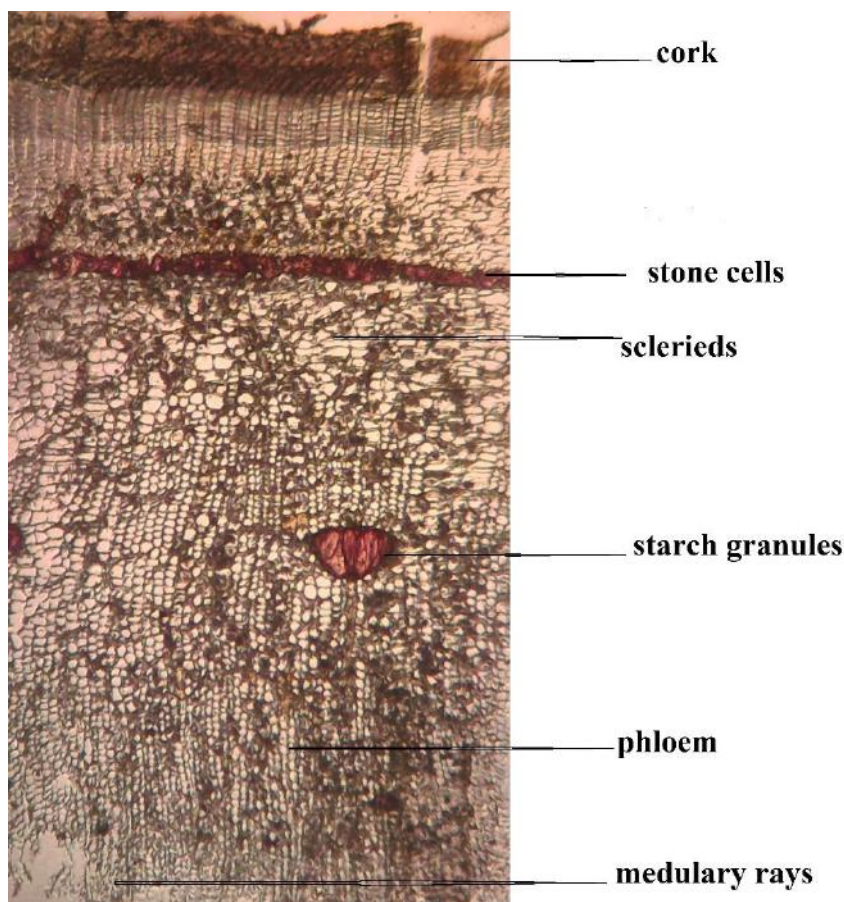


Figure 3. : T.S (Stem bark)

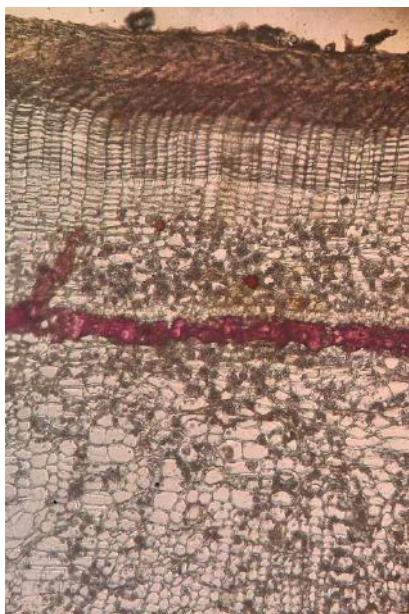


Figure 4. : TS (stem bark)



Figure 5. : TS (Stem bark)

#### **Powder Microscopy:**

Organoleptic characters – The stem bark was brown in colour, had no odour. The powder was smooth in texture, astringent and bitter in taste.

Diagnostic characters of the powder – powder microscopy of the sample shows prismatic crystals of calcium oxalate as shown in figure 6. Starch granules (simple & compound) were found as seen in figure 7. Tangentially elongated cork was seen as shown in figure 8. Surface view of the powder microscopy shows cork as shown in figure 9. Fibres and colouring matter were also seen.





Figure 6. (Powder microscopy)



Figure 7. (Powder microscopy)

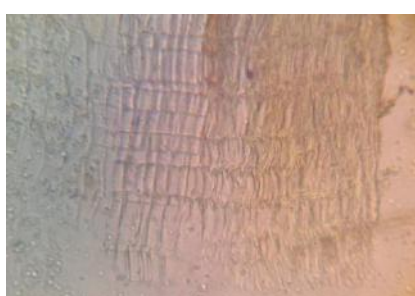


Figure 8. (Powder microscopy)



Figure 9. (Powder microscopy)

## CONCLUSION

The presence of pharmacognostical characters such as prismatic crystals, starch, fibres etc. can serve as important microscopic diagnostic character of the drug *Caesalpinia pulcherrima* (L.) Sw. (stem bark).

## REFERENCES:

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- <sup>v</sup> Khandelwal K.R, "Practical Pharmacognosy – Techniques and Experiments" 9<sup>th</sup> Edn, Nirali Prakashan Pune 2002 p.n. 24-29, 149-153.
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