

PHARMACOGNOSTIC STUDY AND PHYTOCHEMICAL ANALYSIS OF LEAVES OF *COUROUPITA GUIANENSIS*

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ABSTRACT

Objective: This study aim's in dealing with the Pharmacognostic Study and Phytochemical Analysis of Leaves of *Couroupita guianensis* (family: Lecythydaceae). **Materials and Methods:** Pharmacognostic study shows the lamina and petiole region of leaves of *Couroupita guianensis* and the powdered leaves were used to evaluate the powder characteristics, Phytochemical testing were investigated. **Results:** The Pharmacognostic study showed that the leaves are dorsiventral with anisocytic type of stomata and consist of covering trichomes. **Conclusion:** The study revealed that the analysis will be helpful in the characterization of crude drugs

KEYWORDS: *Couroupita guianensis*, Lecythydaceae.

INTRODUCTION

In human culture, medicinal plant exhibit an essential role in development. Medicinal plants are regarded as valuable resources of traditional medicines.

One such traditional medicinal plant is *Couroupita guianensis* (Figure:1) belonging to the family Lecythydaceae. It is also known as Cannonball tree, Nagalinga pushpam (Tamil), Ayahuma (Ayurveda). It is a deciduous tree which belong to tropical forests of Central and South America, and it is cultivated in many other tropical areas throughout the world. There are many medicinal uses for different parts of *Couroupita guianensis*, and in India the tree is prominent for its cultural and religious importance.

Couroupita guianensis is announced to treat gastritis, scabies, bleeding piles, dysentery, scorpion poison. Headache is mildly cured by using pulp of fruit. Stomach ache and cold intestinal gas formation were cured by flowers. The fragrance of flower is used to cure asthma, it also shows analgesic, anti-inflammatory, immunomodulatory, wound healing, antimicrobial, antioxidant, antifungal, anthelmintic, and antinociceptive activities with a broad spectrum of antibacterial action. The infusion of flowers is used as immunoboosters. The leaves of this plant is used to treat various skin diseases.



Figure 1: *Couroupita guianensis*.

MATERIALS AND METHODS

Plant collection

The leaves of *Couroupita guianensis* were collected from St. Thomas College, Kozhencherry, Kerala. They were washed, separated and cleaned. Some of the leaves were dried using shade drying method, powdered uniformly and stored.

Pharmacognostic Study and Phytochemical Analysis Organoleptic evaluation

The external morphological characters, shape, texture, odour and taste of leaves of *Couroupita guianensis* were observed.

Microscopic evaluation

The drug was completely examined by this method. It can be used to distinguish the organized drugs by their own histological characters.

Transverse section of leaf

Free hand sections and microtome sections of the leaves of *Couroupita guianensis* were taken. Thin sections were selected, stained with Safranin, mounted in glycerin, observed microscopically.

Powder microscopy

Powder microscopy is an evaluation technique in which it is used for studying the specific microscopic characters by using staining reagent.

Take sufficient amount of powder on a microscopic slide add 1-2 drops of safranin. The sample were spreaded over the slide. Mount in glycerin, and microscopically viewed. Repeat the procedure in 2-3 slides to get maximum characters. Transfer the images using the attached camera.

Phytochemical Testing

Methanolic extract of leaves and flowers of *Couroupita guianensis* was obtained by maceration. Chemical tests for different classes of chemical constituents like alkaloids, carbohydrates, terpenoids, saponin and flavonoids were performed.

RESULTS

Macroscopic character

Couroupita guianensis leaves were green in color usually with 8-35 cm long, but can reach length up to 57 cm. The leaves has acceptable odour with bitter taste and smooth texture.

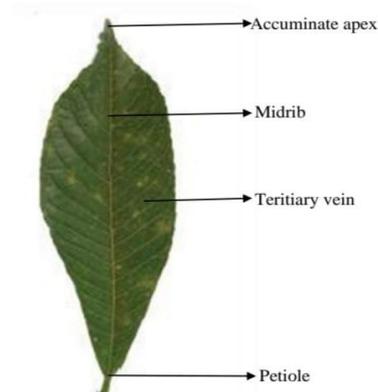


Figure 2: Leaf of *Couroupita guianensis*.

Microscopic evaluation

The transverse section of leaves of *Couroupita guianensis* shows that the leaf is dorsiventral with anisocytic type of stomata and consist of covering trichomes.

Cross section of lamina of leaves of *Couroupita guianensis*

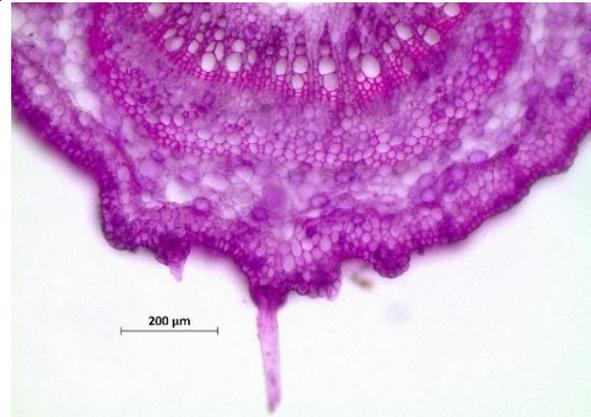


Figure 3: Lower epidermis with covering trichomes.



Figure 4: Pallisade cells.



Figure 5: Upper epidermis and vascular bundles.

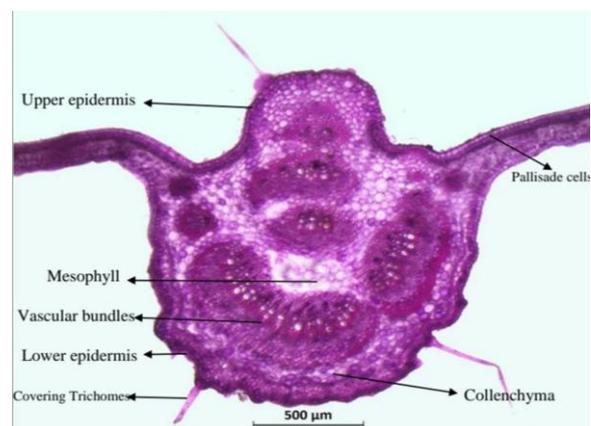
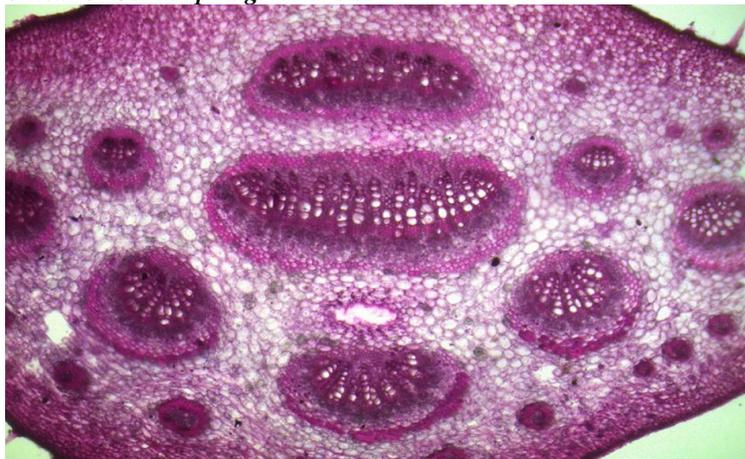


Figure 6: Cross section of lamina of leaves of *Couroupita guianensis*.

Cross section of petiole of leaf of *Couroupita guianensis*Figure 7: Cross section of petiole of leaf of *Couroupita guianensis*.

Powder microscopy

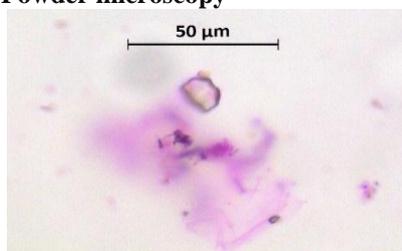


Figure 8: Prismatic crystals

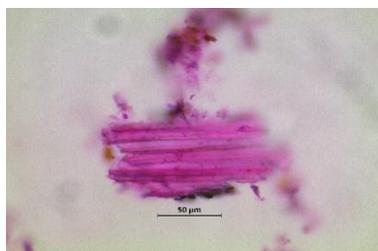


Figure 9: Fragments of fibers

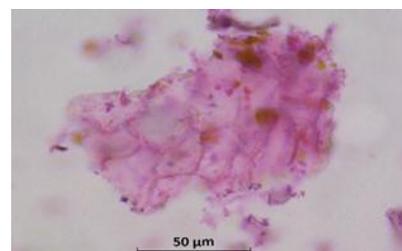


Figure 10: Upper epidermal cell in surface view



Figure 11: Fibers associated



Figure 12: Stomata



Figure 13: Starch grain with calcium oxalate crystal

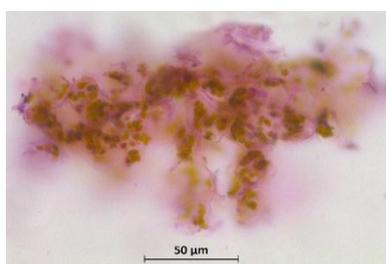


Figure 14: Spongy parenchyma

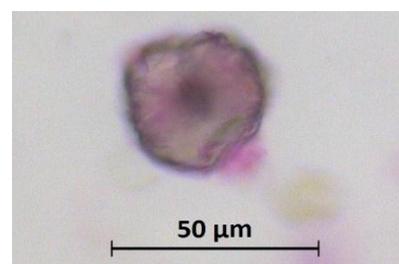


Figure 15: Rosette crystals of calcium oxalate

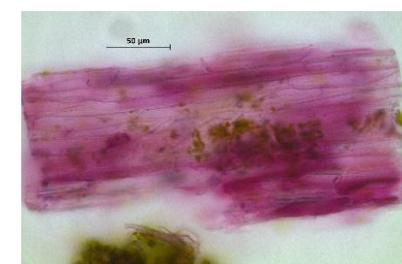


Figure 16: Epidermal cells from petiole

Table 1: Phytochemical screening of aqueous leaves and flower extracts of *Couroupita guianensis*.

S. No	Name of the compounds	Name of the test	APPEARANCE	
			Leaf	Flower
1	Alkaloids	Hager's test	✓	✓
		Dragendorff's test	✓	✓
		Mayer's test	✓	✓
		Wagner's test	✓	✓

2	Carbohydrate	Molisch test Fehling's test Benedicts test	✓ ✓ ✓	✓ ✓ ✓
3	Saponins	Foam test	✓✓	✓✓
4	Tannins	Ferric chloride test Gelatin test	✓ ✓	✓ ✓
5	Flavonoids	Ferric chloride test Alkaline reagent test Lead acetate test	✓✓ ✓ ✓	✓ ✓ ✓
6	Terpinoids	Salkowaski test	✓	✓
7	Glycoside	Bromine water test Borntrager's test	✗ ✗	✗ ✗
8	Proteins and amino acid	Ninhydrine test Biuret test	✗ ✗	✗ ✗

“✓✓” shows potent presence of compound

“✓” shows slight presence of compound

“✗” shows absence of compound

CONCLUSION

The result of this study shows that *Couroupita guianensis* has characteristic organoleptic features. The powder study shows the presence of fibers, prismatic crystals, spongy parenchyma, rosette crystals of calcium oxalate, stomata, starch grain etc. The transverse section shows that the leaves are dorsiventral with anisocytic type of stomata and covering trichomes. Phytochemical screening of the leaves and flower extract of *Couroupita guianensis* confirmed the presence of carbohydrate, flavonoid, alkaloid, saponins, and terpenoids.

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