

MICROSCOPICAL STUDY OF CINNAMOMUM TAMALA: LEAVES

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ABSTRACT

Cinnamomum tamala (Buch-Ham.) is a tree within the Lauraceae family which native to India, Nepal, Bhutan, and China, commonly known as the tejpat, Malabar leaf and Indian bay leaf in India and grow up to 1.4 m girth and 7.5 m high. The used parts are leaves, bark and essential oil. Used as carminative, used in colic and diarrhoea. Bark is aromatic, stimulant, antigonorrhoeic, hypoglycemic, stimulant, anti-rheumatic and antidote for scorpion sting. The leaf is bitter, sweetish; heating, alexiteric; useful in vata and tridosha condition like scabies, diseases of the anus and rectum, piles, heart troubles, ozoena, bad taste. While leaf extracts shows antioxidant, anti-ulcer and antimicrobial effect.

KEYWORDS: Lauraceae, Tejpat, Cinnamomum Tamala.

INTRODUCTION

Cinnamomum tamala known as *tejpat* bay leaves in trade, found in Himalayan region are promising medicinal plant species. Its leaves are widely used as specie throughout the world since ancient times. It is used in Indian system of traditional medicines in various Ayurvedic formulations. Leaves and bark have aromatic, astringent, stimulant and carminative qualities and used in rheumatism, colic, diarrhea, nausea and vomiting. The essential oil of the leaves called *tejpat* oil is medicinally used as carminative, anti-flatulent, diuretic and in Cardiac disorders. It is also used in pharmaceutical preparations because of its hypoglycemic, stimulant and carminative properties. *Cinnamomum tamala* also known as tejpat, Malabar leaf, Indian bay leaf is a moderate sized evergreen tree attaining a height of 8 m and a girth of 50 cm. Leaves lanceolate, glabrous; alternately placed, opposite and short stalked 3-nerved from the base.

The leaf is bitter, sweetish; heating, alexiteric; useful in vata and tridosha condition like scabies, diseases of the anus and rectum, piles, heart troubles, ozoena, bad taste. As per the Unani medicine, the leaf has a sharp taste and use as a tonic to the brain, anthelmintic, diuretic in inflammation, sore eyes, stops salivation and good for liver and spleen condition. The bark is given for gonorrhoea and given in decoction or powder in suppression of lochia after child.^[1]

Botanical Name

Kingdom: Plantae

Division: Angiosperms

Class: Magnoliids

Order: Laurales

Family: Lauraceae

Genus: *Cinnamomum*

Species: *C. tamala*

Synonym: *Cinnamomum albiflorum*

Medicinal Plant

The **dried leaves** of Cinnamomum Tamala plant/tree are called **Tejpatta** and used as a spice and in ayurvedic medicine. The flowers of this plant are also used in folk medicine.

Pharmacological Action

Tejpatta (Indian Bay Leaf) is an antioxidant. When it is added in fat rich food, it increases the shelf-life by preventing oxidative degradation of lipids. So, it can become the alternative to synthetic antioxidants used in food preservation.^[2,3]

1. Lipid Lowering Activity and Free Radical Scavenging Effect

The methanolic extract of leaf for lipid lowering activity on rabbit and found that lipid profile was reduced by 14.0, 1.0, 4.0 and 15.0 mg/dl for total cholesterol, HDL-C, LDL-C and triglyceride respectively after using the plant extract (dose

500mg/rabbit for 10 days); where atorvastatin (0.005mg/rabbit) was used as standard lipid lowering agent.

2. Reno-protective properties

The reno-protective properties of *Cinnamomum tamala* against gentamicin-induced nephrotoxicity in rabbits.

3. Antifungal and antioxidative

The fungicidal potential of *Cinnamomum tamala* Nees & Eberm (Lauraceae) leaf oil against five food spoilage and pathogenic fungi. In addition antioxidant efficacy of seven different solvent extracts derived from leaf was also evaluated using in vitro models. The oil demonstrated potent antifungal activity against *Aspergillus niger*, *A. fumigatus*, *Candida albicans*, *Rhizopus stolonifer* and *Penicillium* spp. in agar diffusion assay.

4. Gastroprotective Activity

Cinnamomum tamala leaves extract (CTE; 50,100 and 200mg/kg body weight) was administered orally, twice daily for 5 days for prevention from ethanol (EtOH)-, cold-restraint stress (CRS)- and pylorus ligation (PL)-induced ulcers. Estimation of H(+)K(+)ATPase activity and gastric wall mucous were performed in EtOH induced ulcer model, antioxidant enzyme activities was carried out in CRS-induced ulcer model, and various gastric secretion parameters like volume of gastric juice, acid output and pH value were estimated in PL-induced ulcer model.

5. Antidiarrhoeal activity

The antidiarrhoeal potential of 50% ethanolic extract of *Cinnamomum tamala* on experimentally induced castor oil diarrhoea, gastric emptying of phenol red meal, gastrointestinal transit of charcoal meal and in vitro mast cell degranulation activity. *C. tamala* extract (25, 50 and 100 mg/kg, orally) produced a dose dependent reduction in the total amount of faecal matter in castor oil-induced diarrhoea.

6. Pro- or antioxygenic activity

The pro- or antioxygenic activity of tejpat and red chilli, their fractions extracted using various solvents, and of chlorophyll, capsaicin and dihydrocapsaicin were determined in refined sunflower oil at 37°C. Tejpat and its fractions containing chlorophyll showed pro-oxygenic activity and the catalytic action increased with increase in concentration of chlorophyll in the fractions. On the other hand, fractions which did not contain chlorophyll such as the aqueous extract and chlorophyll-free spice or fractions freed of chlorophyll by column chromatography were devoid of pro-oxygenic activity.^[4,5]

2. MATERIAL AND METHOD

2.1 Macroscopic study

The collected drugs i.e (black and white) seeds of Kapikacchu were dried and studied for its organoleptic

property, with naked eye and magnifying lens with the help of pharmacognostical procedure i.e. Appearance, size, shape, colour and odour and findings were recorded.

2.2 Microscopic study

The micro chemical test of powdered seeds. Microscopic slides were prepared either by soaking a pinch offine powder in distilled water for 1 hr. and staining with saffranin for 2-4 minutes or treating with solution of chloral hydrate for 1 hour. It reveals the absence or presence of lignified cells, cuticle, crystals of calcium oxalate, mucilaginous cells, Hemicellulose, stone cells and endodermal starch grains.^[6,7]

3. RESULTS AND DISCUSSION

3.1 Morphological Parameters

Morphological characteristics of *Cinnamomum tamala* (*Tejpat*) has been described in **Table**.



Figure. Dried leaves of *C.tamala*.



Figure: Powder form of *C.tamala*.

3.2 Observation of Organoleptic Characters of *C.tamala* leaves

Colour: Brownish-green above, pale yellow

Odour: Aromatic

Taste: Astringent, Slightly pungent

Size whole leaf (cm): 8-18×2.3-4.5

Petiole (mm) Shape: 7.5-13

3.3 T.S. Microscopy



Figure. Vascular Bundles of *C.tamala*.



Figure. Aleurone Grains of *C.tamala*.

3.4 Powder Microscopy

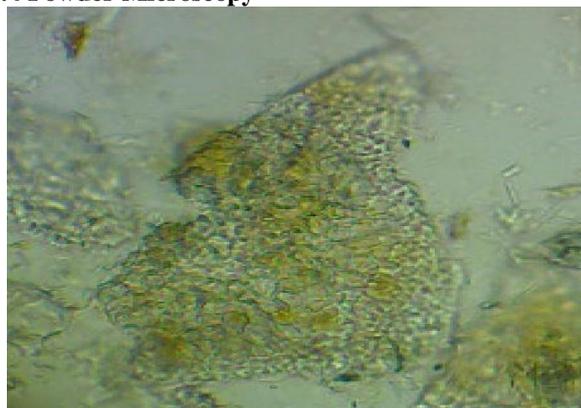


Figure. Aleurone Grains of *C.tamala*.

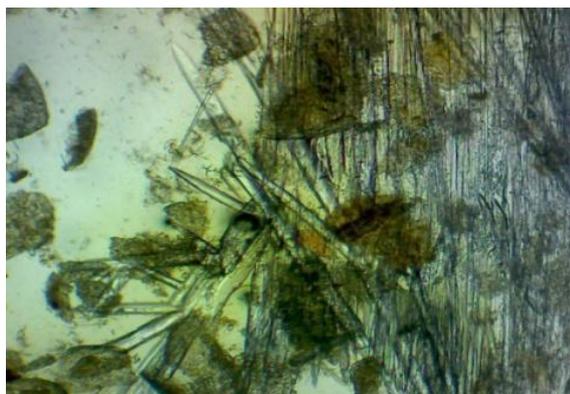


Figure. Calcium Oxalate Crystals.



Figure. Eugenol of Volatile oil.



Figure. Cuticle Oil glands.

The Microscopy of both leaf and powder was observed under microscope. Aleurone grains were observed in both the powdered seed in yellow colour. The needle shaped crystal was found in the powder microscopy resembling the presence of calcium oxalate crystal. Vascular bundle was observed in leaf and Powder.

4. RESULT AND DISCUSSION

The present study was aimed to pharmacognostical of *C.tamala leaves*. Leaves family Lauraceae. In morphological characters like size : 0.2-0.5 cm diameter & 2-5cm long , shape: oval, colour: Brownish-green above, pale yellow, odour: aromatic, taste : Astringent,Slightly pungent. In microscopic studied vascular bundles, Aleurone grain, Calcium oxylate crystal, Eugenol of volatile oil, Cutical oil present and Starch grain present.

5. CONCLUSION

In the present study, the seed of *C.tamala leaves*. Leaves belong to the family Lauraceae were collected and authenticated. The seed was subjected to size reduction to get coarse powder In morphological characters like size , shape, colour, odour: characteristic, taste and texture. In powder microscopic studied vascular bundles, Aleurone grain, Calcium oxylate crystal, Eugenol of volatile oil, Cutical oil present and Starch grain present.

6. ACKNOWLEDGEMENT

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