

## Research Article



## Pharmacognostical Studies on Leaves of *Madhuca longifolia* (koen) Macbr.

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### ABSTRACT

*Madhuca longifolia* (koen) macbr is an ever-green tree belonging to family sapotaceae commonly known as mahua. The leaf is used by the indigenous people of Australia in curing bleeding, gums, expectorant, coughing's disease, wound healing activity and various ailments. The present study comprises macroscopy, microscopy, histochemistry, physicochemical parameters, phytochemical studies and fluorescence analysis. Pharmacognosy is the initial step for determining the status of organ of plant considered as a crude medicine; hence the current study was done, TLC of flavonoid as a chemical constituents present in the drug for establishing the biomarker compound. These studies will help in future for establishing the pharmacopoeial drug standards.

**Keywords:** *Madhuca longifolia* (koen)macbr, sapotaceae, pharmacognosy, leaf.

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### MATERIALS AND METHODS

The leaves of *Madhuca longifolia* (koen)macbr were collected from local areas of Zaidpur (Barabanki) Uttar Pradesh. The plant sample was authenticated for its botanical identification and authenticated by Dr. Shashiknt Bharatrao Shisode Associate Professor. A voucher specimen has been deposited in L.V.H College Post graduate department of botany in Nashik. Voucher specimen number (L.V.H/Botany /779). After collection some of the leaf pieces were preserved in FAA solution. Remaining leaf were dried and convert into powder .Pharmacognosy of the leaf carried out by following the standard methodology. <sup>16-18</sup>

#### Macroscopy

The leaves were studied for its morphological characters by using the appropriate techniques and methods. <sup>19-21</sup>

#### Microscopy

The transverse section of leaf was taken and observed under microscope /electron microscope under the high and low power of magnification of microscope .Show in the figure no.1, 2,3,4,5,6,7,8.

### INTRODUCTION

**M***adhuca longifolia* (koen) macbr commonly known as Mahua belonging to family sapotaceae.<sup>1</sup>

The tree is well economic value in Maharashtra among aboriginals (Mahadeo-koli, warli tribes and agaree tribes). The leaf is recommended for wound heal, anti-estrogen, leprosy, tonsillitis, skin diseases, scabies and chronic bronchitis. Although this part of plant use little application on its pharmacognostical study and present investigation was going on. <sup>2-6</sup>

The *Madhuca longifolia* (koen)macbr is considered as an universal cathalicon in the ayurvedic medicines. <sup>7-8</sup>

It is a large evergreen tree up to 17 m in height possesses long lasting foliage with milky latex .leaves are broad clustered at the ends of branches elliptic to obovate, stipulate tomentose glabrous deeply pink colour , rounded base. Flowers present near the ends of the branches. Calyx corolla , androecium and gynoecium are present 4 sepals arranged in two whorls. Cream colored corolla is present. 20-24 number of stamens are present and staminoids are absent. <sup>9-15</sup>

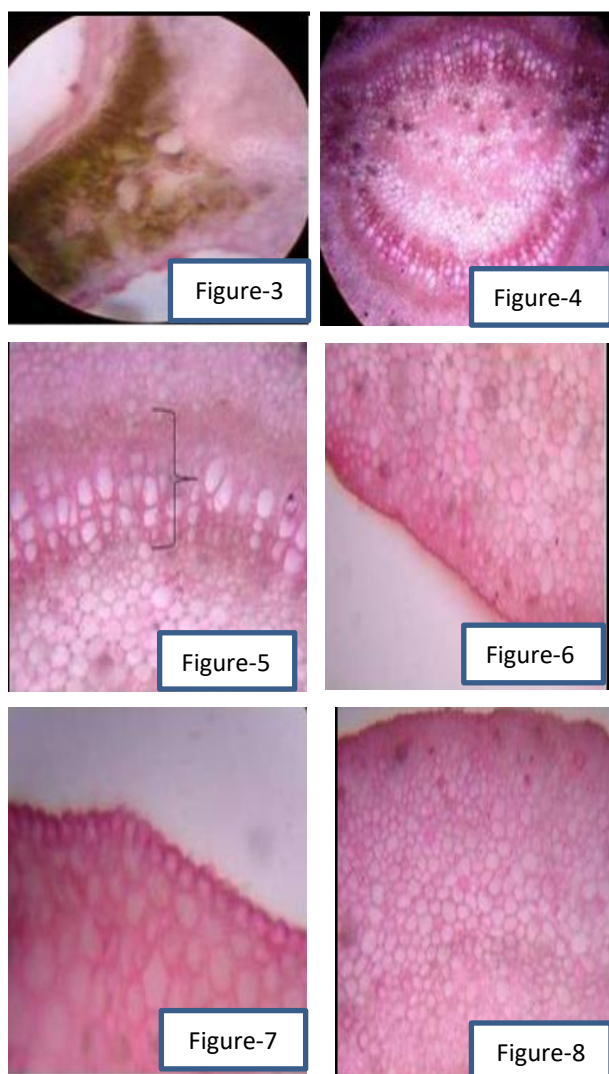


Figure -1



Figure-2





Pharmacognostical studies on leaves of *maduca longifolia* (koen)macbr.figure-1 – whole plant, figure 2- T.S of leaf showing epidermis, figure 3- mahua fruit T.S, figure 4- T.S of leaf –showing different cells, figure 5- shows the dorsiventral lamina, figure 6- shows the shape of vascular bundles, figure 7- shows the xylem and phloem, figure 8- upper epidermis.

#### Histochemistry

The microscopical studies for transverse section of leaf contains cells contents were performed using standard methods.

#### Powder study

The powdered drug was moistened by soaking on it chloralhydrate solution and for microscopical studies it is soaked in 50 % glycerine.

#### Proximate analysis

The physicochemical parameters like –ash values and extractive values where done.

#### Fluorescence analysis

The fluorescence study was carried out by using a ultraviolet radiations the powdered drug is exposed to UV radiations

(visible light, 254 nm, 365nm) was studied using the standard procedure.

#### Preliminary phytochemical screening

A known quantity of dried leaf powder was defatted first with petroleum ether and after that extracted with different solvents like organic solvents and water it gives different concentrations of yield. These extract were tested for different constituents.

#### Thin Layer Chromatography

Extraction of Flavonoids : Powdered sample (5g) was defatted first after that extracted with methanol in soxhlet apparatus for two hours and solvent was evaporated the residue was collected and stored in well closed container.

For TLC dried residue was dissolved in methanol and the standard flavonoid (quercetin 98%w/w) also dissolved in methanol (2mg/ml). Both the samples were loaded on silica gel 60 F (E Merck). The plate was developed using ,ethyl acetate :glacial acetic acid :formic acid :water (5 : 0.5: 0.5 :1.3). The plate was sprayed with NP/PEG.

#### RESULT AND DISCUSSIONS

Macroscopical characters of leaf show on table no. 1

**Table 1:** Macroscopical characters of leaf

Sr no	Morphology of leaf	Observation
1	Colour	Green
2	Odour	Characteristic
3	Taste	Bitter
4	Size	11-15 cm long 5-8 cm wide
5	Shape	Lanceolate to ovate
6	Texture	Short
7	Apex	Acute
8	Arrangements	Opposite
9	Appearance	Smooth
10	Petiole	short

#### Microscopical characters

Transverse section of leaves exhibit following:<sup>22-23</sup>

**Cork :** Two types of cork cell are present thin walled and thick walled these are radially flattened cells filled with tannins and starch grains are scattered in various layers are observed.

**Upper epidermis :** present below the cuticle of the leaf single layered cells found.

**Palisade layer:** xylem ,phloem,

**Xylem:** specialized tissues are present at internal hydrophobic surface.

**Phloem :** polygonal compactly arranged cortical cells.

**Trichomes :** covering and uniseriate type of trichomes.

Stomata :both upper and lower surface contains paracytic stomata.

Powder study : powdered leaf is green in color, bitter and short in in texture. Microscopically powder shows : cortical cells, cork cells, crystal fibres , calcium oxalate crystals and starch grains.

Histochemical test – The section of leaf shows the presence of different primary chemical constituents by treating with different reagents such as glucosides, starch, calcium oxalate crystals and mucilages.

Physicochemical studies – The physicochemical constants includes ash values and extractive values. Shown in the table no. 2.

**Table 2:** Physicochemical studies

S.no	Parameters	Determined value % w/w
a	Extractive values	
1	Alcohol soluble extractive values	27.5
2	Water soluble extractive value	26.02
b	Ash values	
1	Total ash	6
2	Water soluble ash	0.24
3	Acid insoluble ash	0.167

#### Fluorescence analysis

The leaf powder treated with different reagents exhibit various colors in the UV light. The predominant colour was green in most of the test shown in table no. 3.

**Table 3:** Fluorescence analysis

Sr no	Material/treatment	Observation under UV Visible light	Short UV (254nm)	Long UV (365 nm)
1	Drug powder	Muddy green	green	Light brown
2	Drug + coc. HCL	Brown	Black	Black
3	Drug + 1 M NaoH	Light brown	Brown	Blackish brown
4	Drug + ethanol	yellow	green	Light green
5	Drug + acetic acid	Pale yellow	Green	Dark green
6	Drug + pet ether	green	Dark green	Blackish green
7	Drug + water	Green	Brown	Brown

#### Preliminary phytochemical analysis

This study reveals the presence of various type of primary and secondary metabolites shown in table no. 4.

**Table 4:** Phytochemical analysis

Sr no	Phytoconstituents	Water extract	Methanol extract	Ethanol extract
1	Alkaloids	+	+	+
2	Flavonoids	-	+	+
3	Tannins and phenolic compounds	-	+	+
4	Glycosides	+	+	+
5	Steroids	-	-	-

#### CONCLUSION

The macroscopical and microscopical studies helps in the identification of crude drug. The powdered study, phytochemical analysis and fluorescence test authentication of the crude drug. The preliminary phytochemical test can provide the idea about presence of primary and secondary metabolites. TLC detected the presence of flavonoids as a biomarker compound it is the potential source of quercetin yielding herbal drug.

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