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PHARMACOGNOSTICAL AND PHYTOCHEMICAL EVALUATION OF AGNIMANTHA (PREMNA INTEGRIFOLIA) LEAF

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Abstract

Background: The present article reveals the Pharmacognocy and Phytochemical study of *Agnimantha* (*Premna integrifolia*) leaf. **Material & Method**: Pharmacognostical studies and Phytochemical studies were carried out to supplement the necessary information for the systematic identification and authentication of this plant. **Observation & Result:** Leaves are simple, opposite, exstipulate, deltoid ovate to rhomboid. Ovate, entire to sinuate-crenate; sub- acute to obtuse; both surfaces of leaf are puberulous; reticulate; unicostate. In microscopic studies the presence of Trichome, Upper epidermis, Palisade, Cuticle, Lower epidermis, Starch grain, Vascular bundle, Spiral vessels. The powder microscopy studies showed presence of stomata, Vessels, Fibers, Oil globules. **Conclusion:** The structures which are observed here, helps in correct identification of *Agnimanth* (*Premna integrifolia*) leaf.

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Key Words:

Ayurveda, Pharmacognosy, Phytochemicals, *Agnimanth* (*Premna integrifolia*)

INTRODUCTION:

Agnimantha is very important plant since Vedic period. It is called as *Agnimathanaha*, Arani and Nadeyi in Sanskrit, Munja in Malayalam and Taggiberu in Kannada. The twigs of this plant used to be rubbed together to light fire during ceremonial sacrifices, which is evident from the Sanskrit name, *Agnimantha*. It possesses Kapha *Vatahara* karma and *Sothahara* (anti- inflammatory) property. In Ayurveda, the usage of *Agnimantha* leaves is mentioned, as stomachic and against dyspepsia. Leaves are reported to have anti-inflammatory antioxidant, hepatoprotective, antidiabetic actions. A Large shrub or small tree with numerous branches and smooth bark that grows up to 5 to 7 feet height. Leaves are Simple, opposite, exstipulate; deltoid ovate to rhomboid ovate; 1.5 to 5 cm in length and 1 to 4 cm in breadth; entire to sinuate-crenate; sub-acute to obtuse; petiole 3.5 cm long; both surfaces of leaf are puberulous; reticulate; unicostate; 4 to 7 pairs of secondary nerves[1].It is growing near western sea coast from Bombay to Molucca, Malaysia, Sri Lanka, Andaman and Nicobar. It is also found in forest of South India and West Bengal (Northern part). Moreover, it is also recorded as occurring in the plains of Maharashtra, Gujarat, North Karnataka, Assam, Khasi hills and Tarai.[2]

Premna integrifolia (*Lamiaceae*) is an important constituent of the formulation of ten roots of herbs known as *Dashamula* and is widely used for treating various ailments in the Indian system of medicine.[3]

The Genus *Premna* consists 300 species.

VERNACULAR NAMES[4]

No.	Region	Names
1.	English	Wind killer
2.	Hindi	Arani
3.	Sanskrit	*Agnimantha,Agnimanthini*
4.	Malayalam	Tirutali
6.	Marathi	Airan

TAXONOMICAL DESCRIPTION:[5]

Kingdom: Plantae
Phylum: Streptophyta
Class: Equisetopsida
Subclass: Mangoliidae
Order: Lamiales
Familiy: Lamiaceae
Genus: Permna
Species: *Premna Integrifolia*

BOTANICAL DESCRIPTION

A small or medium sized deciduous tree, branchlets and young leaves pubescent or velvety. Leaves membranous, drying black, 3-6 inch long broadly ovate, sharply acuminate, usually quite entire, base cuneate; upper surface glabrous when mature the lower hairy especially as the midrib. Corymbs broad, usually terminating short leafy branchlets rusty pubescent.[6]

A transverse section of the petiole and midrib is composed of a single layered epidermis and cuboidal cells with cuticle thickening. The upper epidermis is followed by collenchyma cells (3-4 layers), and the cortical tissue is composed of numerous rows of parenchyma cells. Vascular bundles containing xylem and phloem were present in the centre of the midrib. The phloem is composed of parenchyma, sieve tubes, phloem rays, and phloem fibres. The xylem is composed of xylem vessels, fibres, wood

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parenchyma and xylem rays. Wood parenchyma containing elongated cells with pitted walls and spiral thickening was present on xylem vessels. At the centre, the ground tissue is made of parenchyma. The metaxylem occurs radially towards the periphery (abaxial surface), while the protoxylem occurs radially towards the centre (adaxial surface). Multicellular non-glandular and glandular peltate trichomes were present on both the upper and lower epidermis. The transverse section of the leaf lamina showed the presence of both thickened upper and lower epidermis with cuticle. The upper and lower epidermis cells are big, rectangular, or cuboid-shaped.[7]

AIM:

To do Pharmacognosy and Phytochemical study of *Agnimantha* (*Premna integrifolia*) leaf.

OBJECTIVE:

1. To study the macroscopic features of *Agnimanth* (*Premna integrifolia*) leaf.
2. To study the microscopic features of *Agnimanth* (*Premna integrifolia*) leaf.
3. To study the powder microscopic features of *Agnimanth* (*Premna integrifolia*) leaf powder.
4. To determine preliminary phytochemical parameters of *Agnimanth* (*Premna integrifolia*) leaf powder.

MATERIAL AND METHODS:

The study was performed at Pharmacognosy laboratory of Upgraded department of *Dravyaguna Vijnana*, Government Ayurveda College, Vadodara.

The plan of work was as following:

1. Plant collection and identification
2. Pharmacognosy study
   - A. Macroscopic study
   - B. Microscopic study
3. Phytochemical study

1. Plant Collection and Identification:

Agnimanth (*Premna integrifolia*) leaves were collected from *Dhanvantari Udhyan*, Government Ayurveda College, Vadodara after proper Identification.

2. Pharmacognosy study:

A. Macroscopic study:

The morphological studies were carried out for shape, size, color, odor and surface of the *Agnimanth* (*Premna integrifolia*)

Observations:

The macroscopical characters of the leaf are opposite, simple, 3-6 inch long broadly ovate, sharply acuminate, usually quite entire, base euneate. When crushed, they release a Characteristic Odour.

Table No. 1: Macroscopic study of *Agnimanth* (*Premna integrifolia*)

No.	Macroscopic characters	Observation	
1.	Size	11-12 cm	
2.	Shape	Ovate	[Fig.1.a]

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3.	Colour	Green	
4.	Odour	Characteristic	
5.	Surface	Smooth velvety	

B.Microscopic study:
Slide preparation:

Transverse section of leaf of *Agnimanth* (*Premna integrifolia*) were prepared separately using reagents Saffranine, Iodine, Sudan III and slides for powder microscopy were prepared using solution of glycerin and water in ratio of 30:70 and observed under microscope. Various microscopic structure of transverse section and powder microscopy of *Agnimanth* (*Premna integrifolia*) leaf are evaluated.

B1: Observations of transverse section of *Agnimanth* (*Premna integrifolia*): Table No. 2: Microscopic study of *Agnimanth* (*Premna integrifolia*) leaf

No.	Characteristics of *Agnimanth* (*Premna integrifolia*) leaf	Figure no.
1.	Trichome	[Fig. 2.a]
2.	Upper Epidermis	[Fig. 2.a]
3.	Palisade	[Fig. 2.b]
4.	Cuticle	[Fig. 2.c]
5.	Lower Epidermis	[Fig. 2.d]
6.	Starch grains	[Fig. 2.e]
7.	Vascular bundle	[Fig. 2.f]
8.	Spiral vessels	[Fig. 2.g]

B2: Observations of powder microscopy of *Agnimanth* (*Premna integrifolia*) leaf
leaf:

In powder microscopy Glandular trichome, Vessels, Fibers, Stomata, Oil globules were found.

Table No. 3: Powder microscopy study of *Agnimanth*(*Premna integrifolia*) leaf

No.	Characteristics of *Agnimanth* (*Premna integrifolia*)	Figure no.
1.	Glandular Trichome	[Fig. 3.a]
2.	Vessels	[Fig. 3.b]
3.	Fibers	[Fig. 3.c]
4.	Stomata	[Fig. 3.d]
5.	Oil globule	[Fig. 3.e]

3. Phytochemical Screening:

Phytochemical screening was performed for presence of alkaloids, flavonoids, steroids, tannins and saponin. In 3gm powder 60ml methanol added and kept for 24 hours and then filtered with filter paper to prepare extract.

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i. Alkaloids
- With Dragendorff's reagent: 2ml drug extract was treated with 1ml Dragendroff's reagent. Orange precipitate was not obtained.

ii. Saponin
- Foam test: Taken test solution and on shaking does not show the formation of foam, which was stable for at least 15 mins.

iii. Flavonoids
- Alkaline test: In 2ml drug extract 2-3 drops of sodium hydroxide were added, then 3-4 drops of dilute hydrochloric acid were added but no colour difference noted.

iv. Tannins: Tannins are soluble in water, dilute alkali, alcohols, glycerol and acetone. Tannins can be precipitated with ferric salts. The extract of sample when treated with very dilute solution of ferric chloride, olive-green colour appeared.

i. Steroids
- Salkowski test: 2 ml extract with 1 ml chloroform mixed and shaken, and then 3-4 drops of sulphuric acid added, red colour not appeared.

Observations:

Table No. 3: Phytochemical Screening of *Agnimanth* (*Premna integrifolia*) leaf

No.	Phytoconstituents	Results
1.	Alkaloids	-
2.	Flavonoids	-
3.	Steroids	-
4.	Tannins	+
5.	Saponin	-

- Absent, + Present

CONCLUSION:

The pharmacognosy and phytochemical standards for leaves of *Agnimanth* (*Premna integrifolia*) are carried out for the first time in this study. The macroscopical characters of the leaf are ovate- sinuate or serrate and Simple. Leaves are green in color, 11-12 cm long. In microscopic study well-defined upper and lower epidermis and trichome, cuticle, palisade, starch grains, vascular bundles, spiral vessels are found. In powder microscopy studies presence of stomata, fiber, vessel, glandular trichomes and oil globules are found. Extractive values are also useful to evaluate the chemical constituents present in the crude drug. Here, tannin found in the phytochemical study. In conclusion, these parameters which are being reported for the first time, could be useful for the identification and preparation of monograph of the *Agnimanth* (*Premna integrifolia*) leaf.

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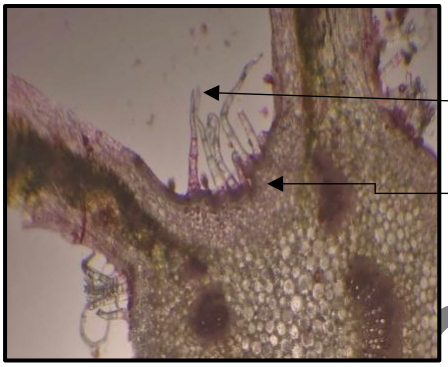
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Plate No. 1: Photos of Macroscopic study of leaf *Agnimanth* (*Premna integrifolia*)

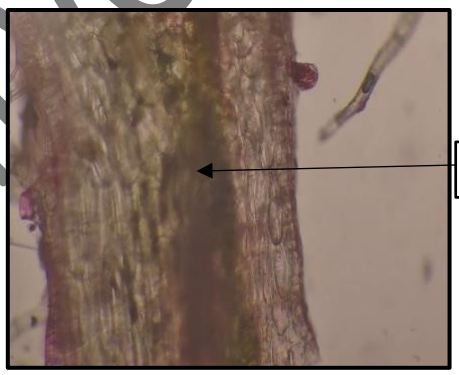


[Fig. 1.a]

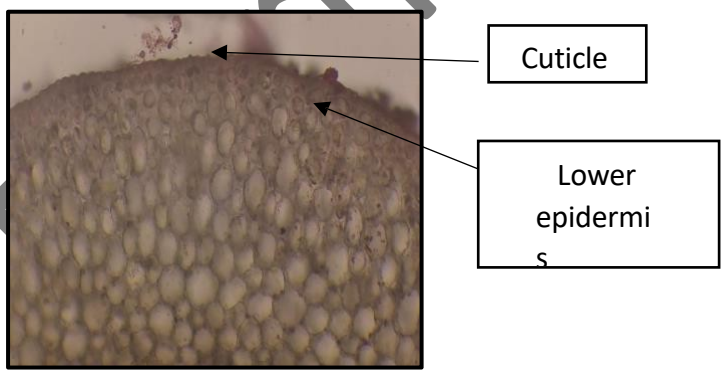
Plate No. 2: Photos of Microscopic study of *Agnimantha* (*Premna integrifolia*) Leaf



[Fig. 2.a]

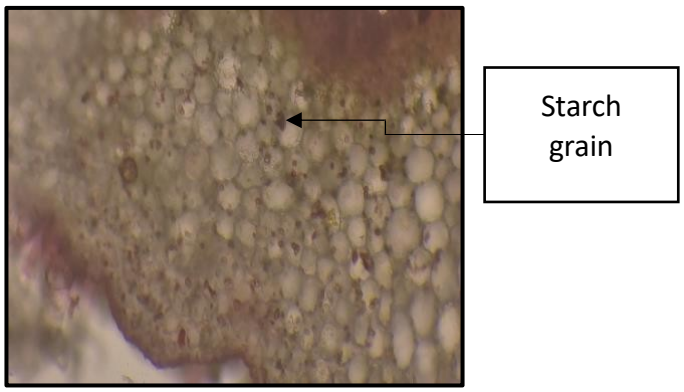


[Fig. 2.b]

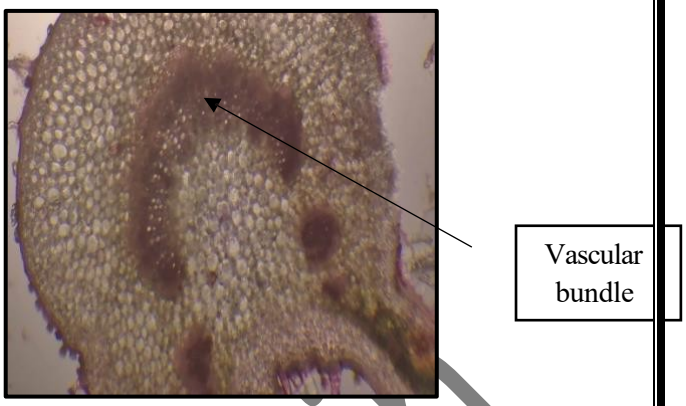


[Fig. 2.c]

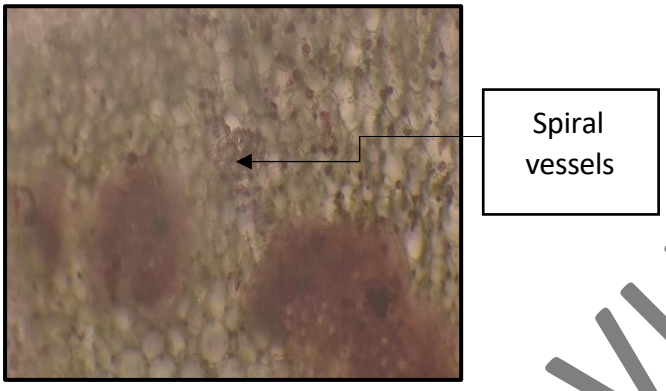
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[Fig. 2.d]



[Fig. 2.e]

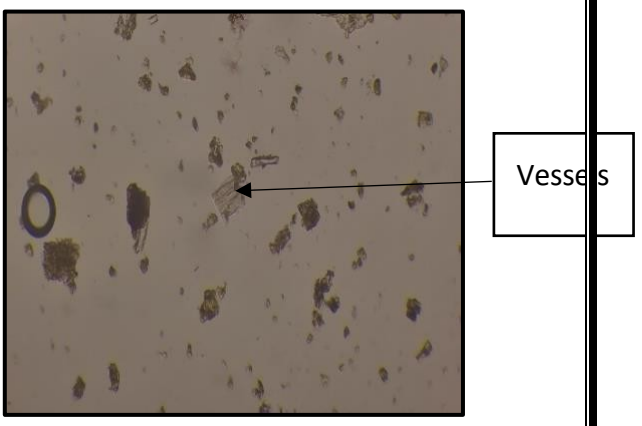


[Fig. 2.f]

Plate No. 3: Photos of Powder Microscopic study of *Agnimanth* (*Premna integrifolia*) leaf

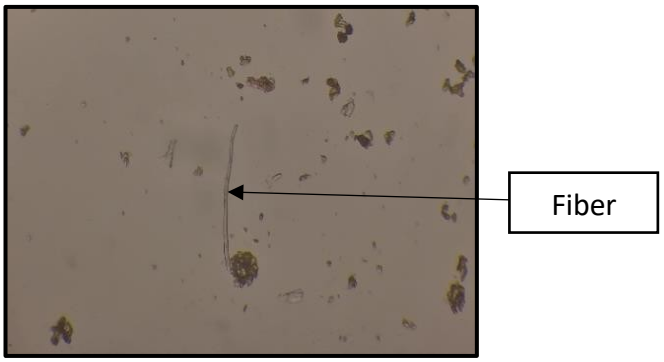


[Fig. 3.a]

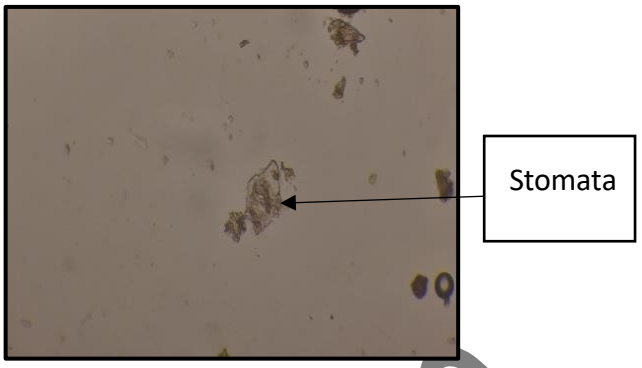


[Fig. 3.b]

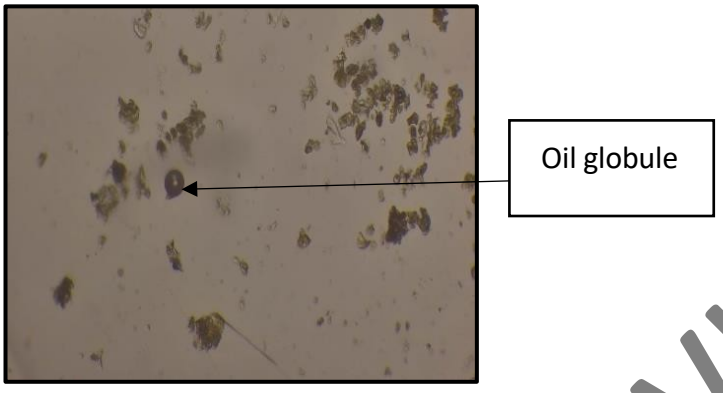
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[Fig. 3.c]



[Fig. 3.d]



[Fig. 3.e]

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