

Pharmacognostic (Morphological and Microscopical) Evaluation of *Aegle marmelos* C. LeavesTushar P. Dukre*, Sagar S. Sangale¹, Akash K. Shelke²¹Department of Pharmacognosy, Shri Swami Samarth Institute of Pharmacy, Malwadi (Bota), 422 602, Maharashtra, India.***Corresponding author**

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C. A. Sydler first coined pharmacognosy to investigate medicinal plants or products. Where these investigations are done by physical, chemical, and biochemical properties. Aegle marmelos commonly known as bael (or bel), belonging to the family Rutaceae, is a moderate sized, slender and aromatic tree. The leaves of bael are available in toothed, pointy, oval-ovate or ovate shapes. The leaves are having light yellow to greenish colour with slight aromatic odour due to the presence of oil globules. The present was indicating the presence of vascular bundle and oil globule with calcium oxalate crystals by using various micro-chemical tests.

Keywords: *Aegle Marmelos*, Pharmacognosy, Morphology, Microscopy**Introduction**

The term of Pharmacognosy was utilized by C. A. Seydler. Pharmacognosy is defined as “The investigation of medicinal products obtained from natural sources including plants, creatures and minerals”. It is also defined as “The investigation of the physical, chemical, biochemical and biological properties of drug medications, medication substances or potential medications of natural origin and additionally the search for new medications from natural sources”. The word Pharmacognosy has been coined by the merger of two Greek words Pharmakon (drug or medication) and Gnosis (to acquire the knowledge of) i.e., the information of medications [1].

The morphological evaluation is also called as Organoleptic or Macroscopical evaluation, which means those evaluation done by “sense of organ” and the evaluation which possible by “naked eyes”. The morphological evaluation is refer as, the drugs are identified by colour, odour, taste, size, shape and special features like touch, texture, sound, etc. The study of form of a crude drug is Morphology, while the description of the form is Morphography. The colour, shape and size of crude drugs should be noted as described in official book, which may vary depending upon several factors.

The microscopical evaluation method allows more detailed examination of drug and it can be used to identify organised drugs

by their histological characters. The evaluation is impossible with naked eyes; possible with a “Microscope” is named Microscopical Evaluation [2].

Due to its many therapeutic characteristics, *Aegle marmelos* also known as Bael and it belongs to the family Rutaceae has been extensively employed in traditional Indian medical practices. Native to Northern India, *A. marmelos* is also widely distributed throughout the Indian Subcontinent, as well as in Ceylon, Burma, Bangladesh, Thailand, and Indo-China. With axillary and 2.5 cm long alternate trifoliate leaves, small flowers, and globular fruits, it is a medium to large-sized deciduous glabrous, armed tree [3].

One of the Hindus' sacred trees is the bael. Since ancient times, prayers to Shiva and Parvathi have included the offering of leaves. A sacred deciduous tree known as Bael is said to have cooling powers and to be connected to Gods. This tree may be cultivated in any home and is popular in Shiva and Vishnu temples. Its leaves are trifoliate, representing the three Thrimurthies—Brahma, Vishnu, and Shiva—and have spear-shaped leaflets that resemble the Thrisoolam, Lord Shiva's weapon. This tree is mentioned in a lot of myths, tales, and folklore. In Shiva temples, the pamphlets are distributed as food, but in Vishnu temples, they are called Tulasi. Flowers bloom in India in April and May, shortly after the new leaves emerge, and the fruit ripens in 10 to 11 months, from bloom in March to June of the following year [4].



Figure 1: *Aegle marmelos* flower, fruit and leaves.

Plant Profile

Scientific Classification [5]

Table 1: Scientific classification of *Aegle marmelos*.

<i>Aegle marmelos</i>	
Kingdom	Plantae
Order	Sapindales
Family	Rutaceae
Subfamily	Aurantioideae
Genus	<i>Aegle</i>
Species	<i>Aegle Marmelos</i>
Botanical Name	<i>Aegle marmelos</i>

Vernacular names [6]

Table 2: Vernacular name of *Aegle marmelos*.

<i>Aegle marmelos</i>	
English	Bengal quince, Beal fruit, Golden apple, Indian quince, Stone apple
Tamil	Aluvigam, Kuvilam, Mavilangai, Vilwam, Villuvam
Telugu	Bilvamu, Maluramu, Maredu,
Hindi	Bel, Bili, Sirphal, and Bela
Sanskrit	Adhararutha, Asholam, Atimangaliya, Bilva
Bengal	Bael, Bel
Malayalam	Koovalam, Vilwam
Orissa	Belo

Botanical Description

Aegle marmelos is a medium-sized, slowly-growing tree that can reach heights of 12 to 15 metres. It has a short trunk, thick, soft, flaky bark, and spreading, occasionally prickly branches, with the bottom ones drooping. Many rigid, straight spines are seen in young suckers [7].

Material and Methods

Pharmacogenetic Evaluations

Morphological Study

The morphological study of was carried out with help of fresh leaves of *Aegle marmelos*, for determination of colour, odour, taste, size, shape and texture of leaves [8].

Microscopical Study

The microscopical study of leaves of *Aegle marmelos* was performed by using transverse section method. In this, methods the transverse section of leaves were taken by soft hand with the help of sharp blade. After that, the thin sections were transfer into watch glass containing water to remove the adulteration. Then the section was stained by using staining reagents and again transfer into watch glass containing water to remove excessive staining. The section was placed on the surface of clean glass slide with one or two drop of water/ glycerin (to avoid the dryness/evaporation). The section observed under the compound microscope [9].

Surface Preparation

The surface preparation study was performed by using a fresh leaves of *Aegle marmelos*. The green surface of leaves was re-

moved by using sharp razor and transparent surface observed under the microscope by using 10X, 40X, 100X lenses [10].

Result and Discussion

Pharmacogenetic Evaluations

Morphological Study

The leaves are deciduous, alternate, and borne as single or compound. In compound leaves, the leaflets have 2 to 5 frivulously

toothed, pointy, oval-ovate or ovate shapes. A leaflet is 3 to 5 cm wide and 6 to 10 cm long (Figure 2). The midribs of the thin leaflets can be seen clearly from below. The petiole of the terminal leaflet is longer. After a dormant or reproductive phase, fresh leaf appears glossy and is pink or Greenish in colour with characteristic taste and typical aroma type odour.

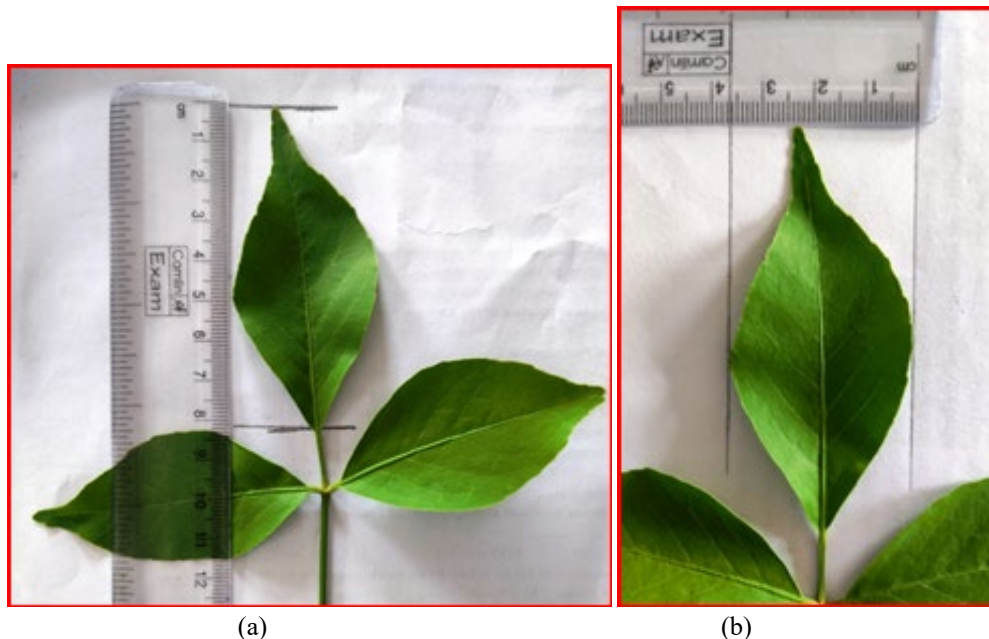


Figure 2: (a) Length and (b) Width of Aegle marmelos Leaves.

Microscopical Study

The micro-chemical tests for microscopical studies were performed by using phloroglucinol, conc. HCl, sudan red III and dil. Sulphuric acid, the observations are as mentioned in the table 3.

Table 3: Micro-chemical tests of Aegle marmelos Leaves.

Test No.	Test	Observation	Inferences
1.	Phloroglucinol + Conc. HCl (1:1)	Pink	Xylem, Phloem (V.B.)
2.	Sudan Red III	Red	Epidermis, Oil Globules
3.	Dil. Sulphuric acid	Soluble	Calcium oxalate crystal

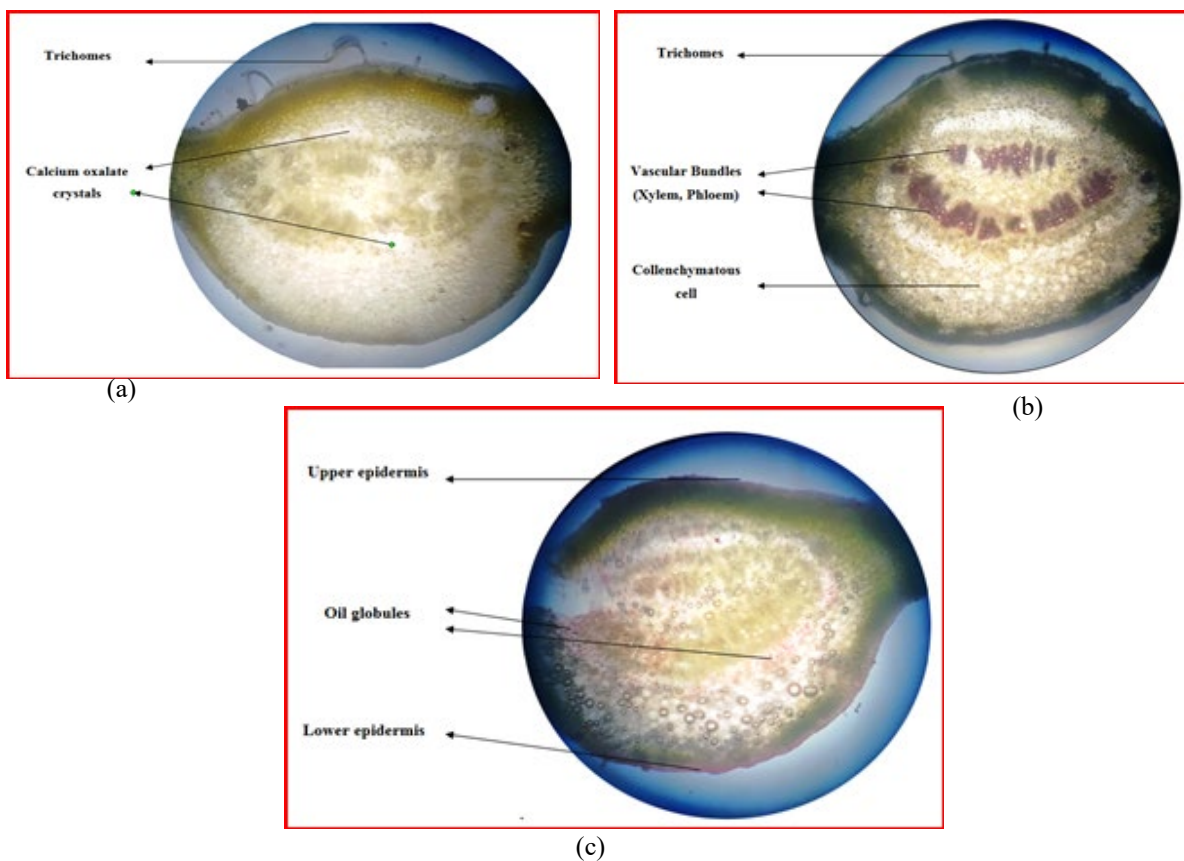


Figure 3: T. S. of *Aegle marmelos* Leaves (a) for Test No. 1, (b) for Test No. 2, (c) for Test No. 3.

Surface Preparation

The surface preparation was performed by removing green surface of leaf. The paracytic stomata with epidermal cells were identified in this study as shown in figure 4.

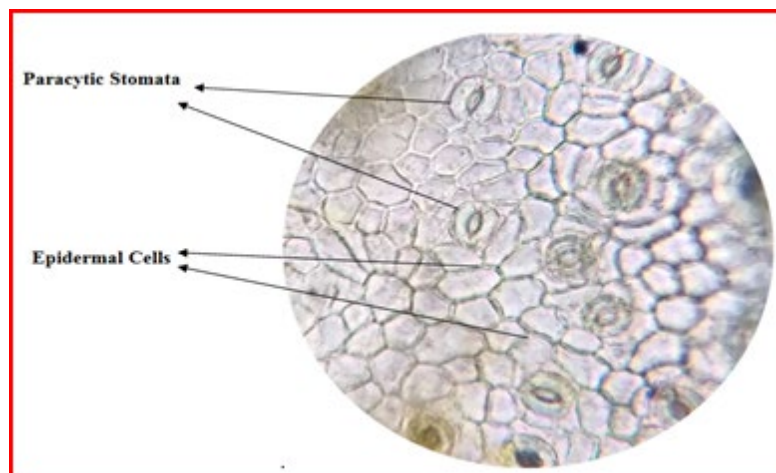


Figure 4: Surface Preparation of *Aegle marmelos* Leaves.

Conclusion

Traditional system of medicine continues to be widely practiced for various reasons. It is strongly believed that detailed information as presented in this research on the pharmacognostic evaluation of the plant leaves might provide detailed evidence to understand

presence of Vascular Bundle, Oil globule, Calcium oxalate crystal, paracytic stomata, and epidermal cells with covering trichomes.

Thus in the near future *Aegle marmelos* could be further using for extraction and isolation phytochemicals.

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