



## Pharmacognostic evaluations of *Phyllanthus emblica* L.

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### Abstract

*Emblica officinalis* belongs to Family Euphorbiaceae, is also called as Amla, is a tree growing in subtropical and tropical parts of China, India, Indonesia and the Malay Peninsula. It is one of the most widely used herbs in Indian traditional medicine and is a constituent of several polyherbal preparations used in Ayurveda to treat many chronic ailments including Diabetes Mellitus. It is found to have excellent anti-oxidant and free radical scavenging activity, protective effect against the damaging effects of UV radiation, inhibits nitrosation reaction in stomach, which helps to prevent stomach cancers, hepatoprotective effect, anti-mutagenic effect and reduced clastogenicity induced by various metals. It is also said to have anti-diabetic effect, hypolipidemic effect and anti-ulcerogenic effect. Hence it makes amla as an interesting natural ingredient that people can incorporate in their daily diets, which may be an effective step to manage various complications. Fresh Fruit, Dried fruit, the nut or seed, leaves, root, bark and flowers. Ripe fruits used generally fresh, dry also used. Each part has a different therapeutic value and must be prepared in its own way for maximum benefits. Amalaki fruit requires a meticulous 21-step process at low heat to maintain potency of the vitamins and minerals as well as the biological intelligence of this remarkable plant. This well-known Ayurvedic drug Amla is standardized in the present study by its pharmacognostic properties.

**Keywords:** *Phyllanthus emblica*, amla, TLC, physicochemical, anatomical, microbial limits

### Introduction

*Emblica officinalis* Gaertn. (*Phyllanthus emblica* L.) (Family: Euphorbiaceae), popularly known as Amla is a common household remedy that finds use in Indian indigenous system of medicine against several ailments. Its fruits have been reported to possess expectorant, purgative, spasmolytic, antibacterial, anti-inflammatory, antiulcerogenic, hypoglycemic, analgesic, antipyretic, adaptogenic, Immuno-modulatory, antitumor, hypolipidemic, Cytoprotective and anti cancer and hepatoprotective activity. *Phyllanthus emblica* have been since generations in traditional Indian medicine to treat a number of diseases. It is an important medicinal plant in Ayurveda and Unani systems of medicine and one of the primary ingredient used in several herbal combinations. According to Charaka Samhita and Sushruta Samhita, *P. emblica* is regarded as "the best among rejuvenator", and "the best among the sour fruits. In Ayurvedic literature, dried amla fruits extract are known to exhibit diverse range of ailments including cough, hemorrhages, asthma, leprosy, intermittent fevers, anemia, bronchitis, peptic ulcer, skin diseases, jaundice, dysentery, cardiac disorders, diabetes also preventing greyness of hair. Besides traditional Indian practices, amla is commonly used throughout South Asia; in Tibetan medical literature, it is suggested to decrease body temperature, an anti-inflammatory and diuretic agent. Fruits are commonly used in the treatment of diarrhea, dysentery and helminthic infections. The fruits of amla contain rich phytoconstituents including; quercetin, ellagic acid, Emblicanin A, emblicanin B, amlaic acid, emblicol, etc

*Phyllanthus emblica* Linn is wild or cultivated throughout tropical India, Vietnam and China from the foot of the

Himalayas up to an altitude of 1000m, usually in mixed deciduous forests.

The tree is small to medium sized, reaching 8 to 18 m in height, with crooked trunk and spreading branches. The leaves are very short, petioled, ovate or oblong, 7-10cm long. The flowers are greenish-yellow. The fruit is nearly spherical, light greenish yellow, quite smooth and hard on appearance, with 6 vertical stripes or furrows [1].

In light of the available literature and scientific evidence stated above *Phyllanthus emblica* is a promising candidate an attempt is made to standardize amla using pharmacognosy as a tool.

### Materials and Methods

#### Voucher specimen

The plant materials were collected and Identity was confirmed with the voucher specimen using [2]. Physico-chemical values such as the percentage of total ash, acid-insoluble ash, and water and alcohol-soluble extractives were calculated as per the Ayurvedic Pharmacopeia of India, [3].

#### TLC fingerprinting

Profile carried as per [4]. For the Anatomical studies, transverse sections (TS) and powder microscopy studies were prepared and stained [5,6]. A standard guideline for total microbial Limit count was provided by WHO [7].

### Results and Discussions

#### Pharmacognosy

**Table 1:** Pharmacognosy features

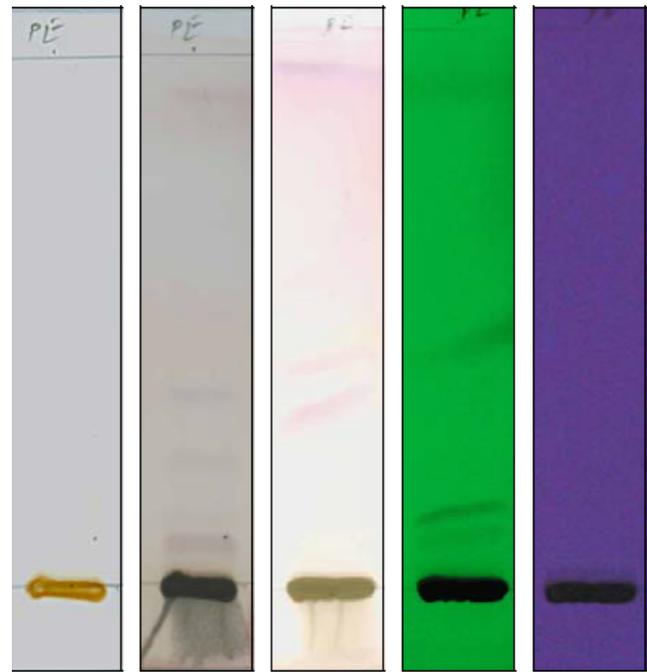
Physicochemical Constants			Organoleptic Characters	
Parameters	Values	Limit	Parameters	Values
TA	9.75%	NMT 7%	Taste	Sweet and acrid
AIA	0.1%	NMT 2%	Color	Brownish black
ASE	17%	NLT 50%	Odour	Mild
WSE	43%	NLT 40%	Texture	Granuloid

TA - Total Ash; AIA - Acid Insoluble Ash; ASE - Alcohol Soluble Extractive; WSE - Water Soluble Extractive, NMT- Not More Than, NLT- Not Less Than Limit as prescribed by Ayurvedic Pharmacopeia of India.

The physico-chemical values were not within the limit. The deviation from the parameter of could be due to the presence of adulteration such as salts, silica or improper handling of raw materials. Alcohol soluble extractive value could be due to the presence of exhausted materials or incorrect processing (table 1)

**Table 2:** TLC Profile

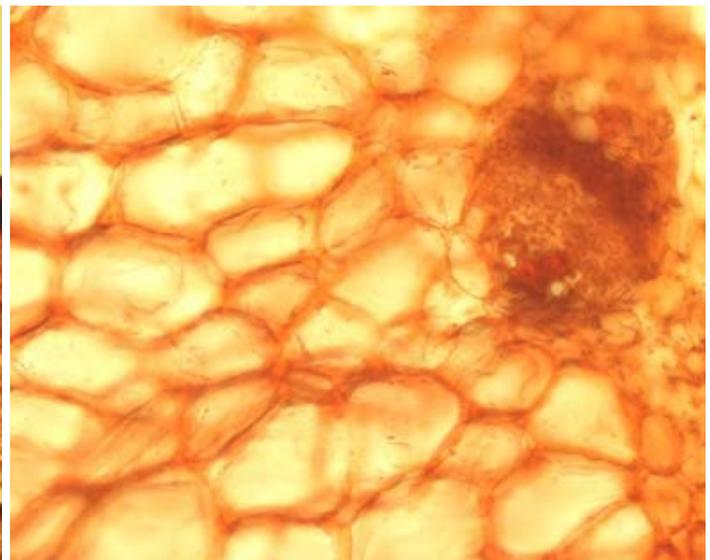
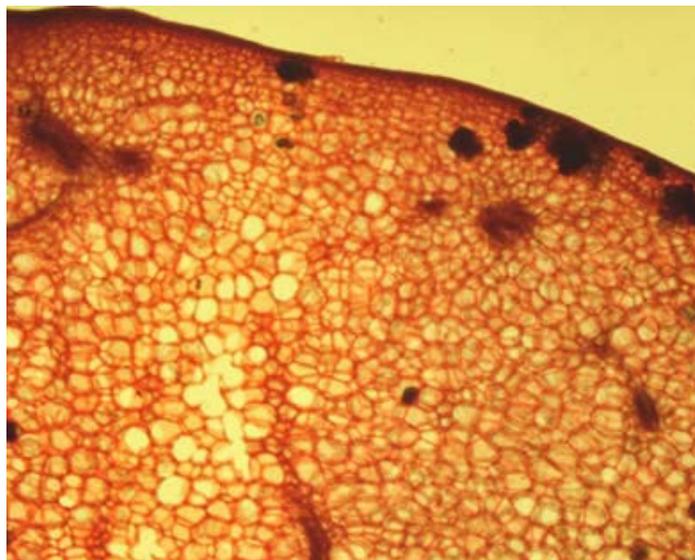
TLC Finger Printing Profile						
Under Visible Light						
Rf Values	-	-	-	-	-	-
Sprayed with 10% H <sub>2</sub> SO <sub>4</sub>						
Rf Values	0.07	0.23	0.35	0.91	-	-
Sprayed with Anisaldehyde						
Rf Values	0.33	0.41	0.95	-	-	-
Under Short UV (254 nm)						
Rf Values	0.14	-	-	-	-	-
Under Long UV (366 nm)						
Rf Values	-	-	-	-	-	-



**Fig 1:** TLC Profile

*Phyllanthus emblica* showed no band under visible light, 4 bands when sprayed with 10% H<sub>2</sub>SO<sub>4</sub> and 3 bands when sprayed with Anisaldehyde. Further 1, 0 band were observed under short and long UV light respectively. The results are qualitative TLC finger print profile of plant under study (table 2, fig 1)

**Anatomical Characters**

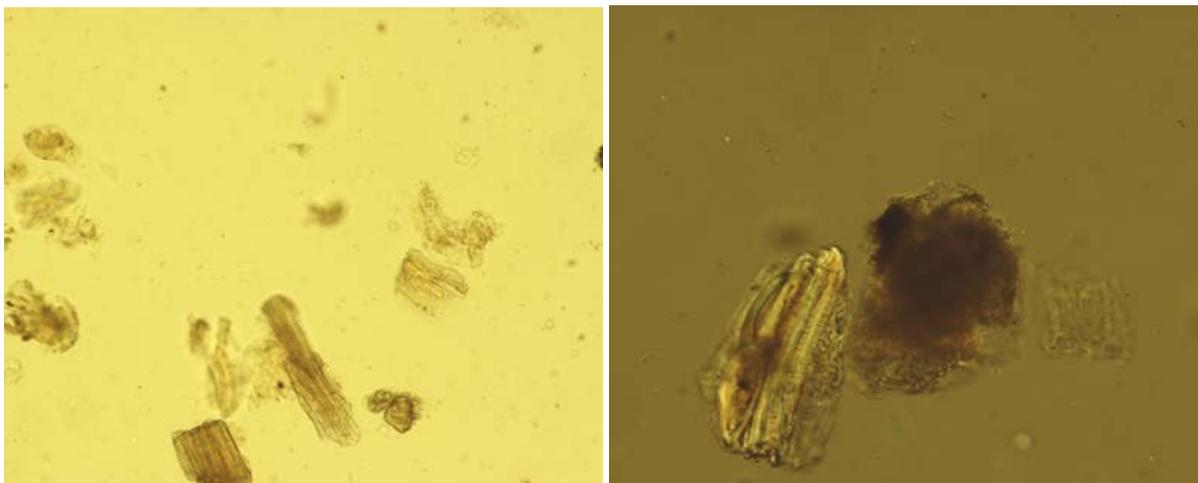


**Fig 2:** Anatomical Characters of *Phyllanthus emblica*

Transverse section of mature fruit shows an epicarp consisting of a single layer of epidermis, 2-4 layers of hypodermis, epidermal cells tubular in shape. Mesocarp forms the bulk of the fruit consisting of thin-walled parenchymatous cells, with intercellular spaces. Several collateral fibrovascular bundles scattered

throughout the mesocarp consisting of xylem and phloem. Xylem consists of tracheal elements, fiber tracheids and xylem fibers (Fig 2).

**Powder Characters:** Powder colour: Dark ash



**Fig 3:** Powder characteristics of *Phyllanthus emblica*

1. Epidermal cells with uniform cells thickened straight wall cells,
2. Isodiametric parenchyma cells with irregular thickened walls,
3. Short fibers and trachieds are present.

6. Johansen DA. Plant Microtechnique. McGraw-Hill, New York, 1940, 523.
7. WHO. Quality Control methods for Medicinal Plant materials, WHO, Geneva, 1998, 22.

Powder microscopy enables the acquisition of knowledge about the various broken parts of the sample that are particular and play a crucial role in the recognition of the raw sample (fig 3).

#### Microbial Limit Test

**Total Aerobic Bacterial Count (TABC):**  $2.1 \times 10^3$

**Total Yeast and Mould Count (TYMC):**  $0.8 \times 10^3$

(Microbial contamination limit for raw herbs - TABC:  $<10^7$ , TYMC:  $<10^5$ )

All criteria were within the limits specified by the WHO Guidelines and Indian Herbal Pharmacopeia

#### Conclusion

In the current study, pharmacognostic approach was taken to set pharmacopeial standards of, a *Phyllanthus emblica* medicinally essential plant. Physicochemical attributes were not in the limits implemented by Ayurvedic Pharmacopeia of India, which mainly could be due to the presence of adulterants. The TLC profile will operate as a fingerprint profile for the plant. Organoleptic, anatomical and powder microscopic tests are plant-specific. The microbial limit of the raw material was within the standard provided.

#### References

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