



# PHARMACOGNOSTIC AND PHYTOCHEMICAL EVALUATION OF *EMBLICA OFFICINALIS* LEAVES (AMLA)

Radhika.B\*, Akshitha, Dharani, Karthikeya

Vaageswari college of pharmacy, beside LMD police station, Ramakrishna colony, Karimnagar, Telangana - 505481

## Abstract

Amla is ancient Indian medicinal plant also known as *Emblica officinalis*. Amla is the only plant with all parts used in treatment of various kinds of diseases. The present study line up with preliminary pharmacognostic and phytochemical evaluations of “Emblica officinalis. The pharmacognostic Examinations were performed with regard to Organoleptic, physical and Microscopic parameters. The leaves were dried and were subjected to consecutive Soxhlet Extraction using solvents like Methanol and water. These Extracts of solvent were subjected to Evaluate preliminary phytochemical Examination ,which helps in detection of various chemical principles found like “carbohydrates ,proteins ,flavonoids.

## Key words:

Leaves of Amla, pharmacognostic phytochemical, physical parameters

## Introduction

Mother earth has gifted a best holly plant *Emblica officinalis* to Homosapiens. Which has a great importance in Indian Ayurvedic medicinal system. Amla is the herbal plant which possess health benefits in all parts of its plant (1). Pharmacognostic studies were performed along with preliminary evaluations of phytochemical studies of *Emblica officinalis* was studied. Pharmacognostic research were carried to Evaluate Organoleptic, physical parameters along with microscopic examination. Freshly obtained leaves were dried and subjected to succeeding Soxhlet Extraction by using solvents like methanol. The concentrated solvent extracts were used in detection of preliminary screening of phytochemicals to know the presence of different types of chemicals in *Emblica officinalis* like Alkaloids, carbohydrates, proteins, flavonoids. *Emblica officinalis* leaves are simple, small, subsessile, closely set along the branches with light green with appearance of pinnate leaves. Leaves of amla are rich in tannins, chemical constituents present in Amla leaves are gallic acid, chebulinic acid, chebulic acid, ellagic acid, chebulagic acid, alkaloids phyllantine, amlic acid and phyllantidine (2). Amla leaves possess good;

- Anti-bacterial activity
- Anti-cancer activity
- Anti-inflammatory activity
- Amla leaves are used in treatment of skin sores and wounds
- Decoction leaves of amla are used as antimicrobial activity, Anti pyretic activity, diabetes treatment
- Infusion of amla leaves used in Diarrhoea
- Leaves of Amla mixed with honey used to treat Dysentery
- Leaves mixed with buttermilk treats indigestion problems
- Leaves are used in Dental problems
- Leaves reduces fever

The present work deals with pharmacognostic and preliminary phytochemical evaluation of *Embllica officinalis* leaves (Amla). Methanol and solvents extract of leaves were used to evaluate the parameters. The Amla leaves were evaluated to determine microscopic, Organoleptic and physical parameters (3).

## Materials and Methods

### Chemicals

All the chemicals were of highest available purity and were Procured from E. Merck, Mumbai, India, HiMedia Laboratories, Mumbai, India and SD fine chemicals, Mumbai, India.

### Procurement of plant material

The leaves of *Embllica officials* had been collected from wild Developing tree with inside the botanical garden, pharmacognosy Department, in vaageswari college of pharmacy in Thimmapur, Karimnagar, Telangana, India. Identification and Authentication had been performed by a certified taxonomist. A Specimen had been deposited with-inside the institutional Herbarium. The collected plant material had been turned into very Loose from any overseas natural matter. Leaves had been separated, coloured dried and powdered with laboratory mixer and sieved pharmacognostic studies had been performed with clean leaves and leaf powder (4).

## Pharmacognostic Evaluation

### Organoleptic evaluation

In organoleptic assessment, numerous sensory parameters of the Plant material, such as size, shape, color, odour, and flavor of the Leaves have been recorded (5). It consists of conclusions drawn from research resulted because of impressions on organs of Senses.

### Microscopic evaluation

The microscopic assessment is critical for powdered crude drugs. Powders of the crude drugs encompass the fragments of cells in with inside the shape of recognisable tissue. Another essential Thing of microscopic assessment is to examine surface constants. The leaf constants like stomatal number, stomatal index, and Palisade ratio have been studied with the aid of using eye piece. These constants are of diagnostic importance and are used for the authentication of leaf capsules or for the detection in their Defects. Various diagnostic characters of leaves and leaf powder Of *Embllica Officinalis* have been studied with the aid of using microscopic analyses with or without straining (6).

#### 1. Powder analysis of leaf

To a little amount of powder taken onto a microscopic slide, 1–2 Drops of 0.1% phloroglucinol solution and a drop of focused hydrochloric acid have been added, set up in glycerol, included with a cover slip and located below the Microscope with  $10 \times 10$  magnification. The characteristic Capabilities of the powder viz., vascular tissues, xylem Fibers, calcium oxalate crystals, starch grains, trichomes Etc. have been recorded the use of fashionable techniques Lignified cells, fibers and stone cells seem purple in colour. presence of starch grains changed into detected via Way of means of the formation of blue colour on addition Of 2-3 drops of 0.01M iodine solution (7).

#### 2. Determination of stomatal index

Leaf fragments of approximately  $5 \times 5$  mm in length have been taken in a test tube containing 5 ml of chloral hydrate solution and boiled on water bath till the fragments get convert into clear (~15 Min). These fragments were transferred microscopic slide, mounted in glycerol and locate below the microscope for the Presence and quantification of epidermal cells, stomata (kind and distribution), palisade cells, vein islet wide variety. The slide has been changed to examine with 45x objective and  $10 \times$  eye piece to which a camera lucida had been attached and changed to record the epidermal cells and stomata lying inside a Selected area. Stomatal index had been changed to calculated as Per the percentage of stomatal number present per number of Epidermal cells and each and every stoma was counted as single Cell (8).

## Physical evaluation

In physical evaluation, crude fiber, moisture content, Ash values viz., total ash, acid insoluble ash and water-soluble ash, and extractive values viz., alcohol soluble extractive value, water Soluble extractive and ether soluble extractive values have been Determined (9, 10, 11). The ash values constitute the Inorganic salts provided in the drug. Extracts acquired by onerous Crude drugs are indicative of approximate measures of few Chemical compounds they contain, the variety in chemical nature And properties of contents of drug. The determinations have been Archived in triplicate and the effects are expressed as mean  $\pm$  SD. The percentage of w/w values have been determined as reference to their air-dried drug.

### 1.Estimation of crude fiber (Acid detergent fiber , ADF)

The ADF of the leaf composed of cellulose, and alkali soluble lignin. In a 500 ml Berzelius Beaker, 2 g of leaf material become distilled through Refluxing with 50 ml ADS (20 gm Cetus trimethyl ammonium Bromide (cetrimide) in 1 litre of formerly standardized N sulphuric acid) through boiling vigorously in the beginning and then extra gently. After 1 hr of reflux distillation, the Beaker contents were collected and AD value was noted (12).

### 2.Determination of moisture content:

Firstly weigh 4 grams of Phyllanthus Emblica linn place in an evaporating dish which is tarred and dry at 105 degrees Celsius for five hours weigh it. At interval of one hour weighed and drying should be continued until between two weighing's the difference must be corresponded should be less than 0.25 %. The weight difference will be constant when two weighing's which are consecutive should be less than 0.01 grams after cooling and drying in a desiccator for 30 minute.

### 3.Ash value

Phyllanthus emblica linn leaf powder was taken 2grms in a Tared silica Crucible and destroyed by burning at temperature less than 450 degrees Celsius until non pollute. Cooling and weighing of resultant ash takes place. Ash percentage was calculated air dried drug reference (13).

### 4.Determination of acid -insoluble ash:

From the one gram of leaf powder total Ash value is obtained is gets boiled in 25ml for five minutes in dilute HCL by using filter paper. Ashless filter paper the insoluble matter gets collected. With hot water it gets cleaned and weighed. by the Air-dried drug reference acid insoluble ash percentage gets calculated (14).

### 5.Determination of water-soluble ash:

From the two grams of leaf powder, they obtain total Ash. Powder gets boiled in 25ml for five minutes by the use of ash less filter paper the collection of insoluble matter takes place it gets cleaned by hot water and weighed. By the air- dried drug reference acid insoluble Ash percentage gets calculated (15).

### 6.Alcohol soluble extractive:

Take leaves separately and weigh 5 grams accurately and soak in 100ML and 95% alcohol for a day (24 hours). Shake the contents frequently for first six hours later remain for 18 Hours. later after 24 hours the filtration of extract takes place 25ML amount of filtrate gets evaporated for a constant weight extract gets dried at 105 Degree Celsius (16).

### 7.Water soluble extraction(extractive):

By the procedure of alcohol soluble extractive, the value of water-soluble extractive gets determined except maceration. chloroform water was used for maceration.

### 8.Ether soluble extractive:

For the preparation of thimble pack. The leaves are taken which are weighed powder for 5grams accurately. Crude drug which is present in pack gets extracted by solvent ether in a apparatus (Soxhlet) for 6 hours. The filtration of extract gates takes place at 105 Degree Celsius the evaporation of filtrate takes place for a constant weight (17).

## Fluorescence characteristics

It is fast method for the design study of crude drug of unsure specimen, when other methods produce inappropriate results. The plant material may be identified from their adulterants on the basis of fluorescence nature (18). Results are described in Table 3.

**Primary phytochemical screening:**

By using Soxhlet apparatus the leaf powder gets extracted successively using petroleum ether (60 - 80 degree Celsius) chloroform, ethyl acetate and water. for 8 hours and for dryness they get extracted. The calculation of percentage yields and weighed. the dried extracts for preliminary phytochemical screening the extracts were used for chemical test a battery is used for carbohydrates tests Molisch's, Benedict's, Barford's and Fehling's test are held for proteins test millon's test and Biuret test are held. or amino acids Ninhydrin's test is held for the Reaction of steroids Liebermann-Burchard and Salkowski test are performed. for anthraquinone glycosides Bontrager's test is held. For saponin glycosides test of foam is for flavonoid glycosides alkaline test and Shinoda test are held. for alkaloid test Mayer's, Wagner's, Dragendorff's, Hager's test is held for Tannins and phenolic's test potassium dichromate, ferric Chloride, iodine tests, lead acetate tests are held (19,20,21).

**DISCUSSION AND RESULTS:****Determination of microscopic evaluation and organoleptic:**

In this organoleptic evaluation parameters like odour, colour, shape, size of leaf powders and leaves studied. Composition of leaf is simple macroscopically. Arranged in opposite. Base and apex are acute. Entire is margin. Average length of leaf size 7.5+or-0.9(cm) breadth is 4.6+or -0. 2cm. Characteristics of fresh leaves, bitter in taste colour is green. As same as leaf. Leaf powder also colour and taste is same. Green in colour and slightly bitter in taste.

\*The leaf powders feature like micromorphological contains both simple and compound like calcium oxalate crystals numerous number and starch grains. xylem and phloem also present in powder. Lignified trichomes are present they are multicellular table 1.

**Physical evaluations**

The physical parameters of *Embllica officinalis* leaves and powdered Leaves viz: Moisture content, Crude fibre, Ash values like acid soluble Ash, acid insoluble Ash, Total Ash and water-soluble Ash. Extractive values like water soluble Extractive values are determined. The results as seen below in table 2

**Table:1 Microscopic characteristics**

Parameter	Value
Phloem fibers(width)	51.29 per sq.mm
Starch grains(diameter)	13.51 per sq.mm
Calcium oxalates(length)	25.12 per sq.mm
Type of stomata(upper and lower epidermis)	Anomocytic
Stomata number (lower epidermis) (Upper epidermis)	15 20
Stomatal index (lower epidermis) (Upper epidermis)	86 per sq.mm 115 per sq.mm
Vein Islet number	26 per sq.mm
Veinlet number	14 per sq.mm
Palisade ratio	7.4 per sq.mm

**TABLE2: Physical characteristics**

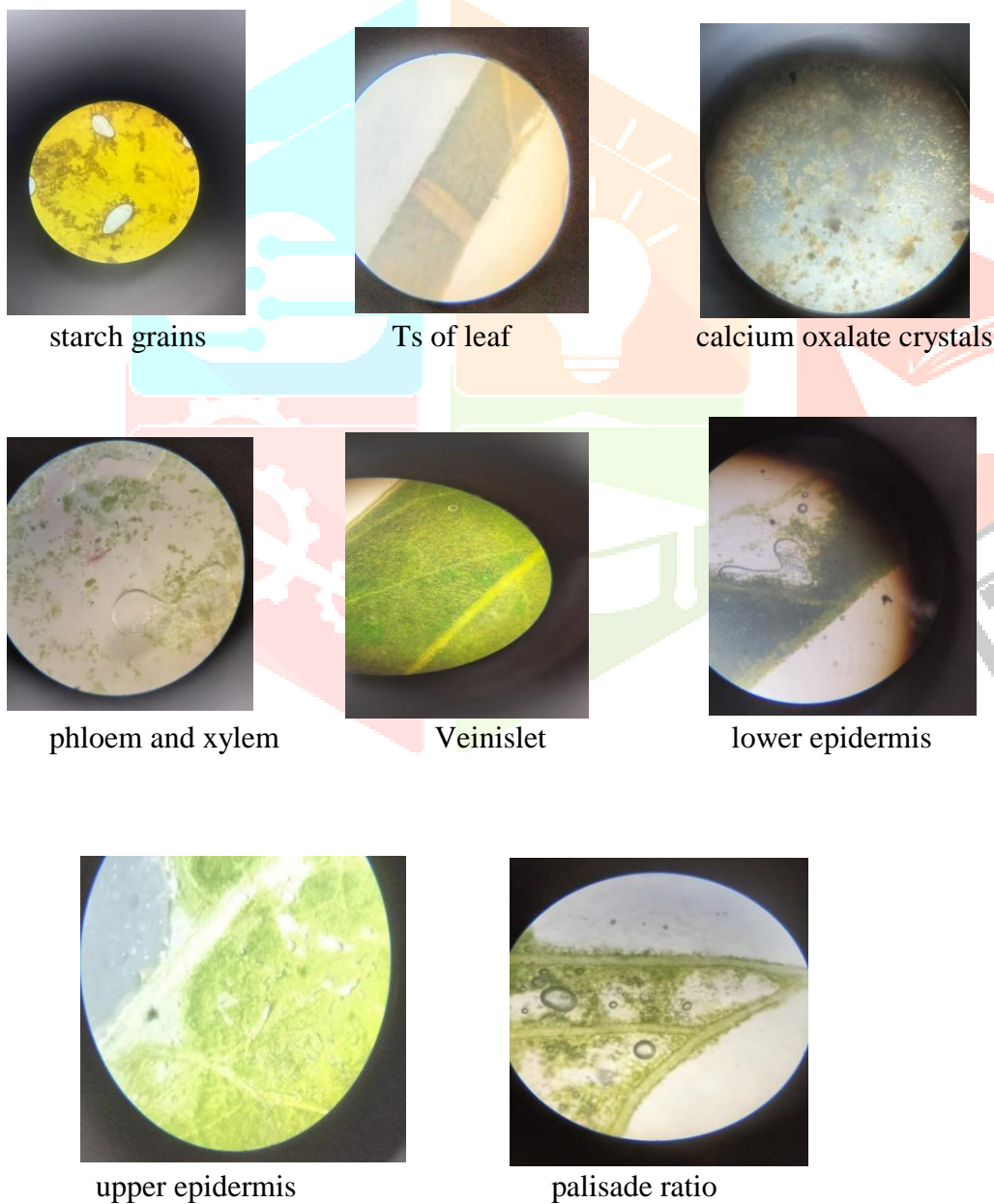
	Observation (colour developed)		
	Visible light	Ultra violet light	
		254nm	366nm
Powder alone	Green	Green	Yellowish green
Powder + Picric acid	Dark Green	Light green	Dark green
Powder + NaOH	Greenish brown	green	Bluish Brown
Powder + Glacialacetic acid	Green	Green	Black
Powder + HCl	green	green	Black
Powder + HNO <sub>3</sub>	Black	Dark Green	Brown
Powder + Iodine	Dark brown	Greenishbrown	Blackish
Powder + FeCl <sub>3</sub>	green	Bluish green	Dark green
Powder + H <sub>2</sub> SO <sub>4</sub>	Light Black	Green	Green
Powder + Methanol	Dark green	Green	Green

**TABLE 3: Results of fluorescence analysis**

Acid detergent fiber	28.5
Moisture content	60.7
Total ash	5.66
Acid insoluble ash	0.66
Water soluble ash	2.33
Alcohol soluble extractive value	8.4
Water soluble extractive value	12.2
Ether soluble extractive value	8.57

**TABLE 4: Phytochemical and preliminary evaluation**

TEST	OBSERVATION
CARBOHYDRATES	+ve
CARDIAC GLYCOSIDES	-ve
FLAVONOIDS	+ve
SAPONINS	-ve
ANTHRAQUINONES	-ve
TANNINS AND PHENOLIC COMPOUNDS	+ve
ALKALOIDS	+ve
PROTEINS	+ve
TANNINS	+ve

**Figure 1: Leaf constants**

## DISCUSSION

The *Emblica officinalis* leaf powder was extracted with petroleum ether (60 - 80 degree Celsius) chloroform, ethyl acetate and water. These chemicals nature, yield is observed. These solvents produce dark green colour extracts from Amla leaf powder. From the above solvents used chloroform produced excessive yield and least Was produced by extract water. the extract yields where shown to be *Emblica officinalis* Is play ancient play Indian medicinal plant. It has various medicinal uses in treatment of diseases. The crude drug is standardized to maintain its unique identity. To include a crude drug in Herbal pharmacopoeia, it's pharmacognostic standard parameters must be Determined. Our present investigation results could serve the basis for genuine Identification, collection and Investigation of *Emblica officinalis* plant. The macroscopic, microscopic and morphological features of *Emblica officinalis* leaf described were different from other genera. Quantitative and Numerical data of *Emblica officinalis* leaf microscopic parameters are distinctive to the herb which helps in standardization of the plant. Phytochemical evaluation shows the existence of different secondary metabolites of plant which has responsible for pharmacological action

## Conclusion:

The parameters of pharmacognostic and phytochemicals were being reported for the initial time. Which could serve as the identification as well as standardization about a crude drug. The statistics shows in the current helps in The ground work for crude drugs implementation of monographs and introduction of various pharmacopoeias.

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