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PHARMACOGNOSTIC EVALUATION OF *AEGLE MARMELOS* LEAVES

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ABSTRACT

Traditional system of medicine consists of large number of medicinal plants, which conveyed their potential therapeutic utilities, *Aeglemarmelos* (Linn) is commonly known as "Bael" belongs to family Rutaceae, widely grown in India. The pharmacognostical evaluation of *Aeglemarmelos* was performed by study microscopy, morphological, phytochemical screening. Fluorescence analysis of various extract of leaves powder with different reagent, elemental analysis for heavy metals iron, chlorides, and nitrates was carried out. Microscopically studies revealed the specific characters in leaves has been observed and phytochemical screening revealed presence of carbohydrates, fats and oils, glycosides, saponins, alkaloids, phenolic compound. Fluorescence analysis of extract of leaves shows different colours with different reagents. The above pharmacognostical and preliminary phytochemical studies will be beneficial for identification and authentication of leaves of plant *Aeglemarmelos*.

KEYWORDS

Aeglemarmelos, Morphology, Microscopy and Phytochemical screening.

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INTRODUCTION

Aeglemarmelos commonly known as bael Marathi, bel in Hindi and Bengali respectively. *Aeglemarmelos* (Linn) (Figure No.1) possess great mythological significance and medicinal significant in ancient system of medicine as well. It is a tall tree with rather slender stem and rough thorny bark. *Aeglemarmelos* is a wild plant about 10m in height and easily available in dry forest on hills and plains of Northern, Central, Eastern and Southern Maharashtra in India a tree with slender thorny stem and rough grey brown bark belonging to family Rutaceae. The air dried leaves contain green juice, saponificable matter 100%; It is reach source

of Ayurveda medication utilization[1,2,3,4]. The extract of various parts of plant *Aeglemarmelos* shows antimicrobial, anti-inflammatory, antifungal, antipyretic, antidiuretic activity (Reference: 1,2,8). In present study the pharmacognostical and phytochemical characteristic were studied to set a monograph of *Aeglemarmelos* leaves.

MATERIAL AND METHODS

Materials

Plant collection and Authentication: The leaves was collected from the plants, The plant was authenticated by Dr. S. G. Kotwal Department of the botany, K.T.H.M College, Nashik, Maharashtra, India, Dated 11/02/2016.

Method

Extraction

The leaves were dried, coarsely powdered and extracted first with water then with either acetone or methanol, chloroform, respectively by heating under reflux of soxhlet method. The extract was concentrated under reduced pressure to a semisolid mass and it was made free from solvents. Extract of leaves were subjected for fluorescence analysis and detection of heavy metals[3,5-7].

Microscopy analysis

Microscopic study was carried out by preparing thin hand section of leaf. The sections were cleared with alcohol/water and stained as per the official method (Such as Sudan red III, iodine solution, dilute H_2SO_4, Phloroglucinol HCl). In Sudan red III cuticle showed red colour, Inphloroglucinol HCl xylem showed pink colour and in dilute Iodine solution blue colour starch in epidermis shown by section of leaves[4,7,8] (Figure No.2).

Phytochemical investigations

The water, acetone, chloroform, petroleum ether, methanolic extract of the leaves were subjected for further preliminary, qualitatively phytochemical investigation[,3,6,9,10].

Fluorescence analysis

Fluorescence analysis of leaves carried out by standard method. It was observed under day light and UV light (254nm and 365nm)[6,7,10,11].

Determination of Ash values

The total ash, acid insoluble, water soluble and sulphated ash was determined as per official method[3,4,6,7,8].

Heavy metal/ elemental analysis presence

Ash of plant leaves consist of Inorganic element like Iron, Chloride, Nitrates, remains unchanged in ash[,5,6,8,10].

RESULTS AND DISCUSSION

The Morphological, Microscopically, Phytochemical Analysis and Extractive Values were performed for leaves of *Aeglemarmelos*. Results are presented in tabular form as given below;

The microscopic characteristics of leaves of *Aeglemarmelos* identified were acuminate apex, crenulated margin, horizontally venation, colour is green, taste is bitter, thorns or prickle are present leaves are arranged in trifoliate base leaflets likes blades ovate to elliptic, length is 3.9-11 and width is 2.4-6.2. Numerous diacytic or caryophyllus stomata, trichomes are unicellular, stomatal index 6.8 - 7.5, transverse section of leaves showed pink colour xylem in phloroglucinol HCl, red cuticles in Sudan red III blue colour starch in dilute iodine solution.

According to protocol the given plant species *Aeglemarmelos* leaves powder incinerate at 500 to 650˚C for 5 to 6 hours. After carbon free Ash value was determined, the total cash value 16.5%w/w, water soluble ash values 9.022%w/w, acid insoluble ash values 2.25%w/w and sulphated ash values 3.75%w/w was to be found and the crude drug Extractives values; by using different organic solvents such as in chloroform 255w/w, alcohol 21%w/w, petroleum ether 26.25%w/w and water 29.37% w/w and foaming index 100 was determined as per procedure.

The chemical or phytochemical investigation was carried out by using standard procedure. The total ash of the drugs was subjected for testing different inorganic constituent; fluorescence analysis of powder was done by standard method[3,4,7,10,12].

Table No.1: Microscopic observation of *Aeglemarmelos* leaves

S.No	Characterizes of Plant Species	Observation by Calculations
1	Morphology	Length : 3.9-11cm Width : 2.4-6.2cm
2	Microscopy	Stomata : Diacytic / Caryophyllus Stomatal index:6.8-7.5 Trichomes : Unicellular PhloroglucinolHCl : Pink colour xylem of Vascular Bundle Sudan redIII : Red colour cuticle Dillute Iodine solution: Blue colour starch in epidermis

Table No.2: Physical standards of *Aeglemarmelos* leaves

S.No	Ash Value	Observation
1	Total Ash Values	16.5%W/W
2	Water Soluble Ash Values	9.022%W/W
3	Acid Insoluble Ash Values	2.25%W/W
4	Sulphated Ash Values	3.75%W/W
	Extractive values	**Observation**
5	Chloroform	25%W/W
6	Alcohol	21%W/W
7	Petroleum Ether	26.25%W/W
8	Water	29.37%W/W
9	Foaming Index	100

Table No.3: Phytochemical screening of *Aeglemarmelos*

S.No	Extract Phytochemical Test	Pet. Ether	Acetone	Methanol	Chloroform	Water
1	Alkaloid test Mayers Hagers Wagners Drangandroffs	 - ve - ve - ve - ve	 - - - -	 - - - -	 - - - -	 - - - -
2	Carbohydrates test Molish Fehlings Benedicts	 - ve - ve -ve	 + - +	 + - -	 - - -	 + + +
3	Protein test Biurets	 -ve	 -	 -	 -	 -
4	Non reducing sugar Iodine	 -	 -	 -	 -	 -
5	Amino acid test Ninhydrine	 -ve	 -	 -	 -	 -
6	Oils	-ve	-	-	-	-
7	Phytosteroles Salkowaski	 +ve	 +ve	 +ve	 +ve	 +ve
8	Glycosides test Keller killani Brontagar	 +ve -ve	 - +	 + -	 + -	 + +
9	Phenolic compound $Fecl_3$ Acetic acid: $Dil.HNO_3$	 -ve -ve -ve	 - - -	 - - -	 - - -	 + + +
10	Saponin test	+ve	+	+	+	+
11	Mucilage	+ve	+	+	+	+

+ve: Positive; -ve: Negative

Table No.4: Fluorescence analysis of *Aeglemarmelos*

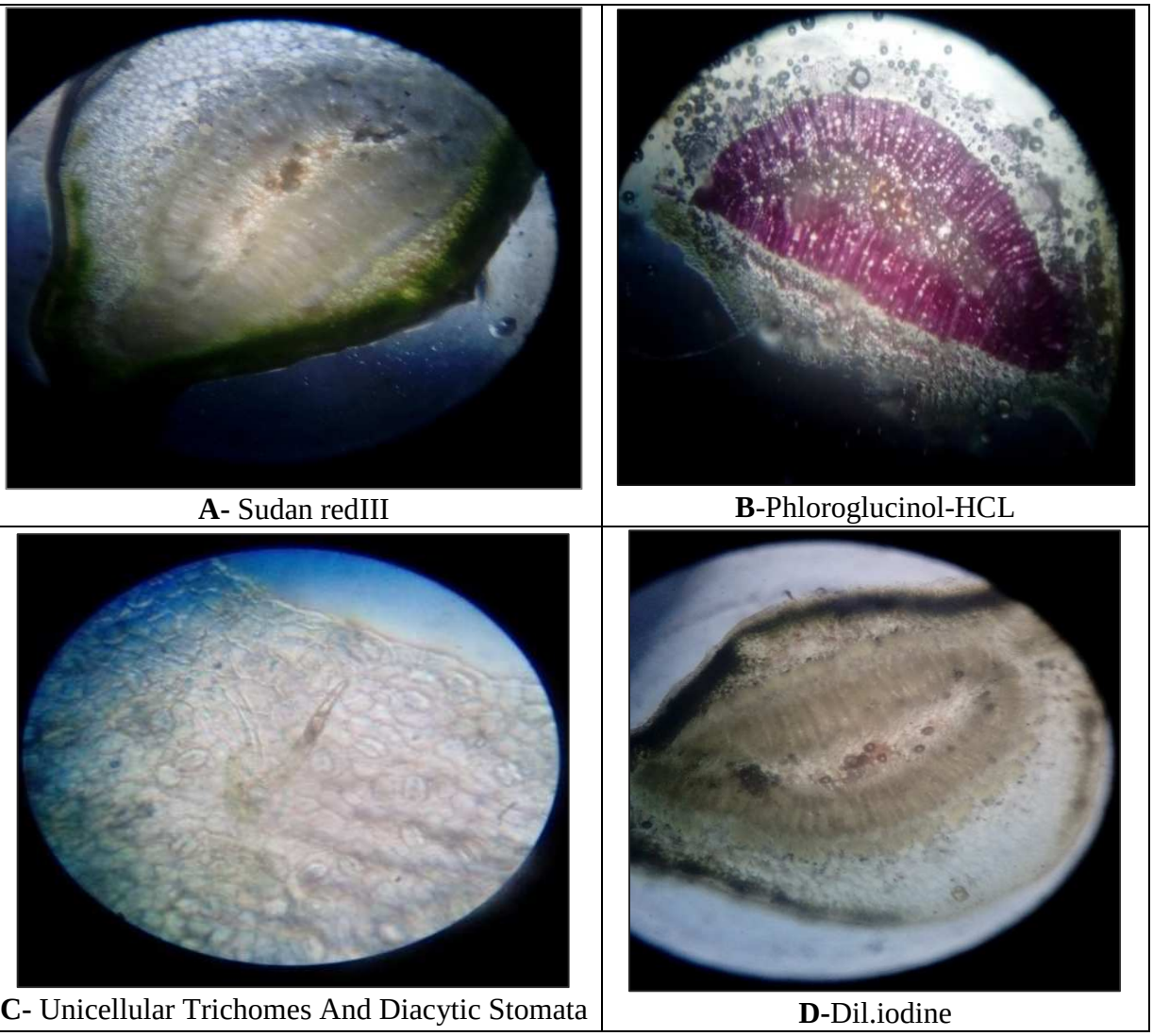
S.No	Extract with Reagent	Pet.Ether	Acetone	Methanol	Water	Chloroform
1	Dil.HNO_3	+	+	+	+	+
2	Dil.HCL	+	+	+	+	+
3	Conc,H_2SO_4	+	+	+	+	+
4	Ammonia	+	+	+	+	+
5	Iodine	+	+	+	+	+
6	NaOH	+	+	+	+	+
7	$Fecl_3$	+	+	+	+	+
8	Lead acetate	+	+	+	+	+
9	Bromine	+	+	+	+	+
10	$Bacl_2$	+	+	+	+	+

+: Positive; -: Negative

Table No.5: Characterization of detection of Heavy Metal

S.No	Test	Observation
1	Calcium	-
2	Magnesium	-
3	Sodium	-
4	Potassium	-
5	Iron	+
6	Chloride	+
7	Carbonate	-
8	Nitrate	+

Figure No.1: *Agelemarmelos* plant



A- Sudan redIII

B-Phloroglucinol-HCL

C- Unicellular Trichomes And Diacytic Stomata

D-Dil.iodine

Figure No.2: Transverse Section of *Aeglemarm*elos Leaves

CONCLUSION

As there is pharmacognostic or anatomical work and characterization of elements and heavy metal on record of Maharashtra, India the present work taken up with lay down standards which could be useful to detect the authenticity of these medicinally useful plants.

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CONFLICT OF INTEREST

We declare that we have no conflict of interest.

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