



Research Article

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**Pharmacognostical, Micromeretic Parameters and Preliminary
Phytochemical Screening of *Eugenia Jambolana* Lam. (Myrtaceae) Seed****Amit Agrawal^{1*}, Ameeta Argal²**¹Research Scholar, Institute of Pharmaceutical Science & Research Center, Bhagwant University, Ajmer, Rajasthan, India-305004²Professor, TIT College of Pharmacy, Bhopal, Madhya Pradesh, India-462042

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Abstract

Medicinal plants have been the subject of intense research due to their potential as sources of commercial drugs or as lead compounds in drug development. Herbal medicines are promising choice over modern synthetic drugs. The *Eugenia jambolana* Lam commonly known as Jamun belonging to Family Myrtaceae (called black plum in English and Jamun in Hindi in India) & original home of jamun is India, in forest up to 1800m usually along the bank and moist localities. It is a large evergreen tree, up to 30m high and widely distributed throughout India, Ceylon-Malaya and Australia. The seeds are sweet, astringent to bowels and good for diabetes. Seed of *Eugenia jambolana* Lam contain glycosides, a trace of pale yellow essential oil, fat, resin, albumin and chlorophyll, an alkaloid- jambosine³, Gallic acid, ellagic acid. it is used in the treatment of liver tonic, enriches blood, strengthens teeth and gums and forms good lotion for removing ringworm infection of the head. Its bark is acrid, sweet, digestive and astringent to the bowels, anthelmintic and in good for sore throat, bronchitis, asthma, thirst, biliousness, dysentery, blood impurities and to cure. The present study shows the pharmacognostical, preliminary phytochemical screening and Micromeretics properties of *Eugenia jambolana* Lam. Seed. Macroscopic properties shows its 1-2cm diameter, oval shape, cream in colour, characteristic odour and astringent taste. Microscopy of seeds reveals the presence of parenchymatous cells, epidermal cells, endosperm containing oil globules with calcium oxalate crystals. Preliminary phytochemical examination of extracts of *Eugenia jambolana* Lam. Seed shows the presence of Glycosides, Alkaloids, Protein & Amino acid, Tannins & Phenolic compounds, Flavonoids, and Steroids & Triterpenoids. Physicochemical Properties of seed like foreign organic matter (1.31%), total ash (8.40% w/w), acid insoluble ash (1.20% w/w) water soluble ash (3.20% w/w) Moisture content (4.51%) and Swelling index (4.28%) were found. Alcohol soluble extractive (14.94%), Water Soluble extractive values (22.20%) and pet-ether extractive values (27.30%) were found respectively. Micromeretic parameters were also determined and angle of repose (30.96), bulk density (0.54) and tapped density (0.65) were found respectively. In these present investigations, various pharmacognostical standardization parameters such as macroscopy, microscopy, micrometrics properties and preliminary phytochemical screening were carried out which could be helpful in authentication *Eugenia jambolana* Lam. Seed. The result of the present study will also serve as reference material in the preparation of herbal monograph.

Key words: Triterpenoids, Steroids, Flavonoids, *Eugenia jambolana* Lam. Seed, Myrtaceae.***Corresponding author****Amit Agrawal**Research Scholar, Institute of Pharmaceutical
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1. Introduction

Medicinal plants have been the subject of intense research due to their potential as sources of commercial drugs or as lead compounds in drug development. Herbal medicines are promising choice over modern synthetic drugs. They show minimum or no side effects and are considered to be safe. Generally herbal formulations involve use of fresh or dried plant parts. Correct knowledge of such crude drugs is very important aspect in preparation, safety and efficacy of the herbal product [1-2].

The *Eugenia jambolana* Lam commonly known as Jamun belonging to Family Myrtaceae (called black plum in English and Jamun in Hindi in India) & original home of jamun is India, in forest up to 1800m usually along the bank and moist localities. It is a large evergreen tree, up to 30m high and widely distributed throughout India, Ceylon-Malaya and Australia. The seeds are sweet, astringent to bowels and good for diabetes. As per Unani system of medicine they acts as liver tonic, enriches blood, strengthens teeth and gums and forms good lotion for removing ringworm infection of the head. Seed of *Eugenia jambolana* Lam contain glycosides, a trace of pale yellow essential oil, fat, resin, albumin, chlorophyll, an alkaloid- jambosine³, Gallic acid, ellagic acid, corilagin and related tannin, 3,6-hexahydroxydiphenoylglucose and its isomer 4,6- hexahydroxy diphenoyl glucose, 1-galloylglucose, 3-galloylglucose, quercetin and elements such as zinc, chromium, vanadium, potassium and sodium. Unsaponifiable matter of seed fat contains β -sitosterol [2-6].

2. Experimental

Methods:

Selection, collection and authentication of plant/plant material:

The fresh plant seeds of *Eugenia jambolana* Lam, were collected in the months Jan 2014 to March 2014 from the in and around local areas of Bhopal District of M.P. and identified & authenticated by Dr Zia Ul Hasan, Professor, Head Dept. of Botany, Safia college of science Bhopal, M.P., and were deposited in Laboratory, Voucher specimen No. 467/Bot/Safia /2014 for seeds of *Eugenia jambolana* Lam, After authentication the plant parts were washed, shade dried and seed crushed to obtain coarse powder .

Pharmacognostic examination:

(I) Macroscopic examination: The morphology of the selected part such as color, odor, size, shape, taste, and surface characters were carried out. [7] (Table: 1)

(II) Microscopic examination:

Seed of *Eugenia jambolana* Lam.:

Microscopy of seeds reveals the presence of parenchymatous cells, epidermal cells, endosperm containing of oil globules with calcium oxalate crystals. Epidermis is 1-2 layered consists of testa and tegnum. Outer layer above epidermis in testa and inner layer below epidermis is tegnum. A thin layer of perisperm is present which in papery in nature. Below perisperm few layer of parenchymatous cells are also present which constitute the vascular bundles. Thick walled oval shaped endosperm is present beneath the epidermis which is cellular in nature. It consists of oil globules, starch grains and calcium oxalate crystals.

Micromeretic parameters: [8]

(i) Angle of repose:

The angle of repose of *Eugenia jambolana* Lam powder was determined using a glass funnel clamped on a retort stand 10 cm away from the flat surface of the bench. 50 g of the powder sample was placed into the funnel and allowed to flow freely to form a conical heap. The angle of repose was calculated from the heap using the equation as follows.(Table:2, Table:5)

$$\tan \theta = h/r$$

$$\theta = \tan^{-1} h/r$$

Where,

h = height of pile, θ = angle of repose, r = radius of the base of the pile

(ii) Bulk Density and Tapped Density: In the present study, we had taken the weighed quantity (50 gm) of shade-dried and presieved (#40/120) drugs powders and carefully added them to a cylinder with the aid of a funnel without any losses. The initial volume was noted and the sample was then tapped until no further reduction in volume was noted. The initial volume gave the bulk density value and after tapping the volume reduced, giving the value of tapped density [8].

(Table: 3, Table: 4 Table: 5)

Physical Evaluation:**Evaluation Parameters:****Physical evaluation:**

The dried part was subjected to standard procedure for the determination of various physicochemical parameters [9-12].

Determination of foreign organic matter (FOM)

Accurately weighed 100 g of the drug sample and spread it out in a thin layer. The foreign matter should be detected by inspection with the unaided eye or by the use of a lens (6X). Separate and weigh it and the percentage present was calculate. (Table-6)

Determination of moisture content (LOD)

Place about 10 g of drug (without preliminary drying) after accurately weighing in a tared evaporating dish and kept in oven at 105⁰ C for 5 hours and weigh. The percentage loss on drying with reference to the air dried drug was calculated. (Table-6)/

Determination of swelling index

Swelling index is determined for the presence of mucilage in the seeds. Accurately weigh 1 g of the seed and placed in 150 ml measuring cylinder, add 50 ml of distilled water and kept aside for 24 hours with occasional shaking. The volume occupied by the seeds after 24 hours of wetting was measured. (Table-6)

Determination of ash value

The determination of ash values is meant for detecting low-grade products, exhausted drugs and sandy or earthy matter. It can also be utilized as a mean of detecting the chemical constituents by making use of water-soluble ash and acid insoluble ash.

Total ash

Accurately about 3 gms of air dried powder was weighed in a tared silica crucible and incinerated at a temperature not exceeding 450⁰C until free from carbon, cooled and weighed and then the percentage of total ash with reference to the air dried powdered drug was calculated. The percentage of total ash with reference to the air-dried drug was calculated. (Table-7)

Acid insoluble ash

The ash obtained in the above method was boiled for 5 minutes with 25ml of dilute HCl. The residue was collected on ash less filter paper and washed with hot water, ignited and weighed. The percentage of acid insoluble ash was calculated with reference to the air dried drug. (Table-7)

Water soluble ash

The ash obtained in total ash was boiled for 5 minutes with 25 ml of water. The insoluble matter was collected on an ash less filter paper, washed with hot water and ignited to constant weight at a low temperature. The weight of insoluble matter was subtracted from the weight of the ash. The difference in weights represents the water soluble ash. The percentage of water soluble ash with reference to the air dried drug was calculated. (Table-7)

Determination of extractive value

Place about 4.0g of coarsely powdered air-dried material, accurately weighed, in a glass-stoppered conical flask. Macerate with 100ml of the solvent specified for the plant material concerned for 6 hours, shaking frequently, then allow to stand for 18 hours. Filter rapidly taking care not to lose any solvent, transfer 25 ml of the filtrate to a tared flat-bottomed dish and evaporate to dryness on a water bath. Dry at 105⁰C for 6 hours, cool in a desiccator for 30 minutes and weigh without delay. Calculate the content of extractable matter in mg per g of air dried material. For ethanol-soluble extractable matter, use the concentration of solvent specified in the test procedure for the plant material concerned; for water-soluble extractable matter, use water as the solvent. (Table-8)

Extraction:

The shade dried coarsely powdered (250gms) were loaded in Soxhlet apparatus and was extracted with ethanol until the extraction was completed. After completion of extraction, the solvent was removed by distillation. The extracts were dried using rotator evaporator. The residue was then stored in dessicator for further used for chemical evaluation.

Phytochemical Screening: [13-15]

Preliminary phyto chemical screening was carried out by using standard procedure. The phyto chemical screening showed the presence of alkaloids, glycoside, carbohydrates, saponins, fats and oils, flavonids, tannins and resins in the respective drugs. (Table: 9)

3. Results and Discussion

Results:

The *Eugenia jambo lana* Lam commonly known as Jamun belonging to Family Myrtaceae , in forest up to 1800m usually along the bank and moist localities. It is a large evergreen tree, up to 30m high and widely distributed throughout India, Ceylon-Malaya and Australia. Macroscopic properties shows its 1-2cm dimeter, oval shape, cream in colure ,characteristic odour and astringent taste .Microscopy of seeds reveals the presence of parenchymatous

cells, epidermal cells, endosperm containing of oil globules with calcium oxalate crystals. Preliminary phytochemical examination of extracts of *Eugenia jambolana* Lam. Seed shows the presence of Glycosides, Alkaloids, Protein & Amino acid, Tannins & Phenolic compounds, Flavonoids, and Steroids & Triterpenoids. Physicochemical Properties of seed like foreign organic matter (1.31%), total ash (8.40% w/w), acid insoluble ash (1.20% w/w) water soluble ash (3.20% w/w) Moisture content (4.51%) and Swelling index (4.28%) were found. Alcohol soluble extractive (14.94%), Water Soluble extractive values (22.20%) and pet-ether extractive values (27.30%) were found respectively. Micromeretic parameters were also determined and angle of repose (30.96), bulk density (0.54) and tapped density (0.65) were found respectively.

Discussion:

For the proper identification of plant, physicochemical parameters provide useful information. From the continuing studies it can be accomplished that the above pharmacognostical characteristics, phytochemical parameters, Micromeretic parameters, together may be utilized for the future studies on *Eugenia jambolana* Lam. Seed This makes the plant beneficial for the future pharmacological activities.

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