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Research article

Pharmacognostic and Phytochemical Evalution of Peel of *Punica granatum*

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ABSTRACT
Pomegranate is a Fruit of Energy, Vitality & great Medicinal Value . A number of medicinal uses has been reported some important onces are Antioxidant, antihelmintic activity, Hepato-Protective activity, antidiarrhoeal activity, Tumor growth inhibitory activity. Present investigation includes examination of morphological and microscopic characters, ash value, extractive values and Phytochemical evaluations including qualitative chemical examination of active constituents were carried out.

Key Words: Punica granatum, phytochemical, phytoconstituent, pharmacognostic.

INTRODUCTION

Standardization plays a significant role in the production of phytopharmaceutical of standard quality as the quality standards are based on proper selection of raw materials. As very little specific standards are mentioned in the official monographs evaluation of the crude drugs is of great improtance for the pharmaceutical industry. This involves the determination of identity and purity of quality. Many organic & inorganic contaminants which are virtually impossible to avoid while collecting crude drugs affect the purity of any crude drug which needs proper assessment & detection based on different pharmacognostic & phytochemical parameters1.

Pomegranate is much prized fruit & its medicinal values have been known since ancient times. Its all parts, root, stem bark, leaves, flower, fruit rind are used medicinally and botanically knowns as Punica granatum (Punicaceae). Within the country it is known under different names DADIMA (Sanskrit), ANAR (Hindi), Pomegranate (English)2.

A deciduous tree or shrub, 1.5- 5m tall with thorny branches, Leaves 2.5-5.5 cm long, oblong, obviate or elliptic- lanceolate, shining above. Flowers long solitary. Fruit- a hard, globose berry, 4-8 cm in diameter crowned with calyx and thick leathery rind. Seeds red or pink and juicy.3

It contains alkaloids chiefly pelletierine. It is rich source of tannin. Juice contain malic acid, citric acid, the seeds are the richest source of estrone. Traditionally it is used in itching, pyorrhea, gum and teeth disorder. Stem and root bark is an effective antihelmintic and taeniacide . Seeds & pulp possess antibacterial activity. The food rind powder has appreciable immuno-stimulatory activity and hepato protective activity. It is also used as astringent4. Pomegranate (Punica granatum Linn) has been traditionally used as antihelmintic5, hepatoprotective6, anticarcinogenic7 and antidiarrhoeal8. The fruit rind of pomegranate shows significant reduction in the percent of diarrhoea. Pomegranate has been used for treatment of itching. A recent study found that Pomegranate juice exhibit three times greater antioxidant activity than other bioflavoniods such as red wine or green tea9,10.

MATERIALS AND METHODS

Plant material: Fruits of Punica granatum was collected in the month of September 2007 and authenticated by Dr. A.K. Pathak.A vocher specimen(BUPH – 4022/B) was deposited in the herbarium of Dept.of .Pharmacy B.U.Bhopal(M.P.) The rinds were manually separated & air-dried. Coarse powder (100gm) was charged in a soxhlet extractor & extracted to remove methanol soluble content. The extract was filtered through whatman filter

Fig:1 Morphology of *Punica granatum*

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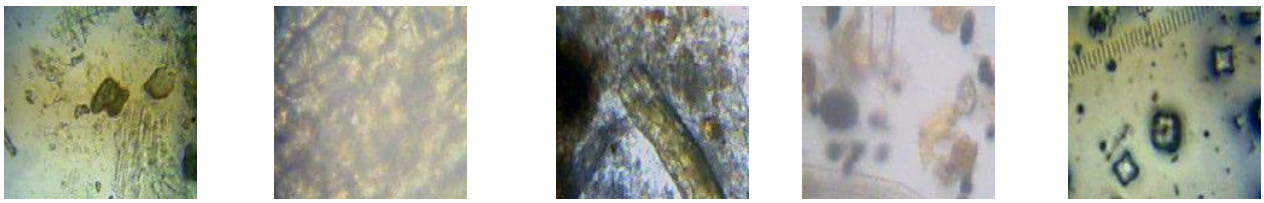

Stone cell Parenchymous cells tanninferrous vessels Starch grain calcium oxalate crystals

Fig:2 Powder microscopic of peel of *P.granatum*

Table:1 Quantitative Microscopy

Parameters	Value
Stomatal Index	217.8
Vein Islet No.	25/sq mm
Vein Termination	43/sq. mm
Palisade ratio	9

Table 2 : Physicochemical Parameters

Parameters	Plant Part	
	RIND	LEAF
Total Ash	3.5%	7.32%
Acid Insoluble Ash	0.4%	0.082%
Water Soluble Extractive	18.6%	19.44%
ethanol soluble extractive	5.81%	22.15%
Pet. ether soluble extractive	4.94%	13.02%
% Moisture content	6.4	-

Table No. 3 : Phytochemical Screening

Chemical Constituent	Test	Result
Carbohydrates	Molisch's Reagent	+ve
	Benedict's Reagent	+ve
Flavonoids	Shinoda Test	+ve
Phytosterols	Salkowski's	+ve
Glycosides	Legal test	+ve
Alkaloids	Dragondroff's test,Mayer's and Wagner reagent	- ve
Tannins	Ferric chloride and Lead acetate	+ve
Protein	Xanthoproteic test	+ve
Saponins	Foam test	-ve

paper, concentrated & air dried till constant weight.

Pharmacognostic Studies: Morphological studies were done using simple microscope. The color,shape,taste & odor of rind were examined . Powder Microscopic studies were carried out by compound Microscope.

Quantative Microscopy: Various parameters like Stomatal index, Palisade ratio, vein islet number and vein termination number were determined according to standard procedures11.

Ash value:Total ash ,water-Soluble ash and acid insoluble ash were determined. Alcohol and water soluble extractive values were determined to find out the amount of water and alcohol soluble components. The moisture content was also determined because of estimation of presence of moisture. Dried rind were incinerated to determine the ash content. The ash obtained was checked for its solubility in dil.HCL, water and sulphuric acid.

Alcohol soluble extractive value: Accurately weighed 5 gm of coarsely powdered air dried drug was macerated with 100 ml of ethanol (90%) in a closed flask for 24 hour,shaking frequently for six hours and allowed to stand for 18 hours. It was then filtered rapidly taking precaution against loss of alcohol. 25 ml of filterate was evaporated to dryness in tared flat bottom shallow dish,dried at 1050C and weighed and kept in a desiccator. Average extractive value in percentage w/w (on dry weight basis) was calculated with reference to air dried drug12.

Moisture content : Approximately 5 gm exactly weighed powdered sample was kept

in IR moisture balance. The loss in wt. was recorded as percentage (%) moisture with respect to air dried sample of crude drug12.

Table No.4: TLC Identification

S.No.	Solvent system	Detection	R_f. values
1.	1% HCl	Iodine fume	0.81, 0.73
2.	BAW	Iodine fume	Tailing, 0.85
3.	BuOH: HCl	Iodine fume	0.45, 0.89, 0.97, 0.91
4.	Ethyl acetate: ethanol : water	UVB	0.55,0.96
5.	$CHCl_3$: Ethyl acetate:formic acid(5:4:1)	Iodine fume	0.74,0.75(dirty yellow spot)

Phytochemical Investigation: Phytochemcial tests were performed according to standard procedures13.

TLC Profile: TLC was done using solvent systems & proper detecting agents for identification of Tannins, flavonoids, proanthocyanidins.14 (Table:4)

RESULT AND DISCUSSION

Powder Microscopic studies showed the yellowish brown stone cells (astrosclerids), Oval to polygonal

parenchymous cells in surface view. Vessels with scarlariform thickening and tanninferrous vessels (brown) are observed . Few rosette shape calcium oxalate crystals are visible. Few starch grain (3-5µ in diameter) are seen (Fig2).

Quantitative Microscopy Stomatal Index, vein-islet number, vein termination number & palisade ratio was determined using standard procedures (Table no.1).

The total ash value, water soluble, acid insoluble ash value are given in (Table:2)

The moisture content of rind of plant is given in (Table :2). The phytochemical tests reveals the presences of carbohydrate ,tannins, glycosides, protein. (Table:3).

TLC was performed for the constituents tested positive (Table:4).The TLC profile reveals the presences of tannin and punicagalin.

CONCLUSION

The present study may be useful to supplement information in regard to its characterization and identification of plant.

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