

**PHYTOCOGNOSTICAL AND PRELIMINARY PHYSICO-CHEMICAL EVALUATION
OF THE LEAVES PARTS OF *PUNICA GRANATUM* (NORTH REGION)****¹Smriti Dubey, ²*Krishanu Samanta and ³Anil Kumar**¹Research Scholar, Pharmacy College, Itaura, Chandeshwar, Azamgarh,²Associate Professor, Pharmacy College, Itaura, Chandeshwar, Azamgarh,³Professor, Pharmacy College, Itaura, Chandeshwar, Azamgarh-U.P.,^{1,2,3}Pharmacy College, Azamgarh 276128, Uttar Pradesh, India.***Corresponding Author: Krishanu Samanta**

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ABSTRACT

Herbal plants are huge sources of medicinal importance, prevent the different disease or maintain healthy life. Plant produces primary metabolites for their basic survival and secondary metabolites for their ecological, taxonomical and biochemical differentiation and diversity. Pomegranate (*Punica granatum*) belonging family Lythraceae are broadly used in traditional system of medicine throughout different part of India. It is a native plant of Caucasian and northern Africa. It has great medicinal importance like fruit, bark, leaf and roots are used worldwide as taenicides, owing to alkaloids, and treatment of diarrhea and oral and genital lesions, owing to tannins and astringency. The study of diseases and their treatment and prevention are important part of our ancient time worldwide. The knowledge of medicinal plants must have been accumulated in the course of many centuries. Herbal medicine prepare different part of plant are used. The seeds contain oil which contains not only the steroidal estrogen, estrone and non-steroidal phytoestrogens including the comesten, coumestrol, and the isoflavones, genistein and daidzein. Both the juice and the oil contain numerous and diverse bioflavonoid, which have been shown to be both potently antioxidant and inhibitory of one or both of the enzymes cyclooxygenase (catalyzing arachidonic acid to prostaglandins) and lipoxygenase (catalyzing arachidonic acid to leukotrienes). it is also use in various skin disease, having a antimicrobial activity. Extracts of the rinds have been shown to be bactericidal, antiviral, antitumor and use of pomegranates in the treatment of Acquired Immune Deficiency Syndrome (AIDS) owing to their antioxidant properties. The main aims of this research are Preliminary physico-phytochemical & phyto-cognostical evaluation of the leaves parts. The current study deals with the characterization of morphological features, determination of physical constant such as the total ash value are 23.01%, Loss of weight drying was 8.1%, foaming index >100, swelling index were 0.2cm, the percent yield for Methanol 16.61%, and aqueous 18.21%.

KEYWORDS: *Pomegranate, Lythraceae; Punica granatum; Total ash; swelling index.***INTRODUCTION**

Diseases their treatment and prevention now a day's herbal medicine is significant part of ancient plant globally. Herbal drugs are essential resource, especially in developing countries, to treatment of different diseases. India is the largest manufacturer of herbal medicine and it is rightly called the "Botanical Garden of the world". India has number of approved indigenous systems of medicine viz-Ayurveda, Siddha, Unani, Homeopathy, Naturopathy is applied for the health care of mankind.^[1] Herbal plants are useful source of traditional & modern medicines for primary health care. This helps to getting increase knowledge of medicinal plants. Ayurveda derived from two words, Au means life and Veda means knowledge. One fourth of modern medicine is derived from plant base origin. Approximately 60% to 80% of the world's populations

still depend on traditional medicines for the treatment general diseases. Even in many of the modern medicines, the basic composition is derived from medicinal plants and has become acceptable for easy availability, least side effects, and low prices, environmental friendly and lasting curative property compared to allopathic medicine.^[2-3] The World Health Organization (WHO) has defined traditional medicine as "the sum total of all the knowledge and practices, whether explicable or not, also used in diagnosis, prevention and elimination of physical, mental or social imbalance and relying exclusively on practical experience and observation handed gone from generation to generation, whether verbally or in writing".^[4] In one of the studies of the World Health Organization, it is estimated that 80 per cent of the population of developing countries relief on traditional plant-based medicines for their health

requirements.^[4-7] There are several factors for the continued popularity of traditional drugs and one is their ready availability as compared to the modern medicines besides the adverse effects of synthetic drugs.^[8] World Health Organization (WHO) has stressed the need to promote the indigenous systems of medicine among the rural population of the third World Countries.^[9]

Punica granatum under the family Lythraceae. It is commonly known as Anar(Hindi/ Punjabi), Dadimah(Sanskrit), Pomegranate(English), Dalimba(Marathi/Gujarati), Dadim(Bengali), Madalai(Tamil), Danimma(Telgu), Talimatatum (Malayalam), Anar tursa /Dulim(Pharsi), Roman Hamiz (Arabi), Granatpfels (Germani) and Pomegranate/Pomegranate apple(French). It is a small tree, shrub that is long approximately 5-8m long some time it may be 12m long found on throughout India, whole Mediterranean region, Caucasian and northern Africa. The pomegranate leaves are glossy and oblong. They are 3-7cm long and 2cm wide. The flower blooming in April and May month. A longitudinal segment of hermaphrodite flower depicting tetras of filaments discarded on the interior surface of the calyx tube. The fruit develop from the ovary and is a fleshy berry. Prominent calyx is crowned the round fruit. The tough, leathery skin or rind is typically yellow overlaid with light or deep pink or rich red. The interior is separated by membranous walls and white, spongy, bitter tissue into compartments packed with sacs filled with sweetly acid, juicy, red, pink or whitish pulp or aril. High temperatures are essential during the fruiting period to get the best flavor. The fruit is the size of a large orange, obscurely six-sided, with a smooth leathery skin that ranges from brownish-yellow to red; within, it is divided into several chambers containing many thin transparent arils of reddish, juicy pulp, each surrounding an angular elongated seed. Herbal plants have ability for the formation of secondary metabolites such as steroids, phenolic substances, flavonoids, alkaloids, glycoside etc. These secondary metabolites are used to treatment of many diseases. It contain valuable ingredient such as flavonoids, ellagitannin, Punicalagin, ellagic acid, vitamins and minerals. On folklore study *Punica granatum*. have various therapeutic applications. *Punica granatum*. used to prevention and treatment of cancer. Also show anti-inflammatory, anti microbial, antioxidants activities. Ellagic acid and hydrolyzable tannins, punicalagin, have the responsible for most pharmacological activities.^[10] Pomegranate peel contains thrice the total amount of polyphenols.^[11] Also peel contain condensed tannins, catechins, gallo catechin, and prodelphinidins.^[12] No proper report was found regarding and preliminary physico-phytochemical phyto-cognostical evaluation of *Punica granatum* till the date. Standardization of herbal drugs are difficult because generally mixture of constituents and the active constituent in most cases is unknown. Now the present study deal the standardize leaves of *Punica granatum*. Keeping this view the aim of the current study deal the a

Preliminary physico-phytochemical Phytocognostical evaluation of the leaves parts of *Punica granatum*.

MATERIALS AND METHODS

Collection and Authentication of Plant

Leaves parts of *Punica granatum*. were collected from Village Itaura, Chandeshwar district Azamgarh, Uttar Pradesh, India in the month of January and authenticated by Prof Anil Kumar, department of Pharmacognosy, Pharmacy college Azamgarh Uttar Pradesh, India. A voucher specimen No- Pca-012/07 has been preserved in Department Pharmacognosy, The leaves parts were dried under shade and powdered (40 mesh size) and stored in airtight containers.

Macroscopical studies

The leaves of the plant were studied for their macroscopic characters such as color, odour, taste, shape and size of the leaf. The macroscopic characters were studied as per given procedure in WHO guidelines on quality control methods for medicinal plants materials.^[13]

Physicochemical and Phytocognostical studies

The loss on drying^[14-15], ash value (total ash)^[16-17], foaming index^[18], swelling index^[13,19], fluorescence analysis^[20-24], phytochemical screening^[25-27], microscopy^[28-29], extractive value(methanol and water), foreign matter were determined according to the official methods of Ayurvedic Pharmacopoeia of India.^[14,30-33], Indian Herbal Pharmacopoeia.^[34] and the WHO guidelines.^[13]

Extraction method

The powdered plant material was extracted with methanol, aqueous respectively in a series using a maceration process. The extracts were concentrated to dryness in vacuum individually to get methanol extract (MEPG), aqueous extract (AEPG) respectively. The yield of Methanol, aqueous extracts were 16.61%, 18.21% w/w respectively. The extracts are stored in a desiccator.

RESULT AND DISCUSSION

The macroscopical study of the leaves of *Punica granatum* was done. The leaves were green in color. Opposite or sub-opposite, glossy and oblong, 3-7cm long and 2cm wide (Table-1). The values of the physical constant like ash values, foreign matter, loss on drying, extractive value were determined. Extractive value and color of extract was investigated (Table-2). Preliminary qualitative phytochemical screening shown that presence of alkaloids, glycoside, tannins, flavonoids and saponins (Table-4). Swelling index contain powdered drug 0.2cm, Fluorescence nature of the powder drug & different solvent extracted drug with different chemicals was analyze using short light wavelength and longer light wavelength and the observation were reported in (Table no-5 & 6). The height of the foam in every test tube was less than 1cm, the foaming index were less than 100 (Table-7). The TS of *Punica granatum* leaf showed the

consist of several parallel rows of xylem & Phloem. Also powder microscopy showed trichomes, Fiber passes through medullary rays, Simple fiber and Group of pitted vessels. This observation indicates that presence of large

varieties of phytoconstituents, present in the extract. In literature survey it was found that the plant possesses several traditional and pharmacological uses.

Table 1: Macroscopical evaluation of *Punica granatum* leaves.

S.NO	Feature	Observation
1.	Color	Greenish
2.	Odour	Characteristics(unpleasant)
3.	Taste	Sour
4.	Shape	Opposite or sub-opposite, glossy and oblong
5.	Size	3-7cm long and 2cm wide

Table 2: Physicochemical analysis of *Punica granatum*. Leaves.

S.NO	Solvent	Weight of plant material (gm)	Percentage of yield(%)	Color of extract
1.	Methanol	4	16.61	greenish
2.	Aqueous	4	18.21	brown

Table 3: Physicochemical parameters of *Punica granatum* leaves.

S. No	Physicochemical parameters	Observation
1.	Loss of drying	8.1%
2.	Total ash value	23.01%
3.	Foreign matter	Nil
4.	Swelling index	0.2cm

Table 4: Phytochemical screening of *Punica granatum*. Leaves.

S. No.	Test	Methanol extract	Aqueous extract
1.	Alkaloids	-	-
2.	Glycosides	+	+
3.	Cardiac glycoside	+	+
4.	Flavonoids	+	+
5.	Tannins and phenolic	+	+
6.	Saponins	+	+

(+)- present, (-)-absent

Table 5: Fluorescence Analysis of *Punica granatum*. leaves Powder.

Sl. No.	Treatment	Normal light	U.V. light (Short length)	U.V. light (long length)
1.	Chloroform	Dark green	Brown	Brown
2.	Benzene	Greenish brown	Brown	Greenish brown
3.	Dil. Acetic acid	Dark green	Brown	Greenish brown
4.	Iodine	Redish brown	Dark brown	Brown
5.	Dil. Hcl	Green	brownish	Greenish brown
6.	Butanol	Dark green	Fluorescence green	Light green

Table 6: Fluorescence Analysis of *Punica granatum*. leaves Extract.

S. No	Extract	Normal light	U.V. light (Short length)	U.V. light (long length)
3.	Methanol	Dark green	Yellowish Green	Black
4.	Aqueous	Brown	Yellowish Green	Black

Table 7: Foaming index of *Punica granatum*. different. leaves Extract.

Treatment	Sample number of the test tube									
	1	2	3	4	5	6	7	8	9	10
Dilutions(drug extract + water)	1:9	2:8	3:7	4:6	5:5	6:4	7:3	8:2	9:1	10:0
Height of foam(cm)	0	0	0	0	0	0	0.1	0.2	0.4	0.5

Microscopy of *Punica granatum*. leave leaves:

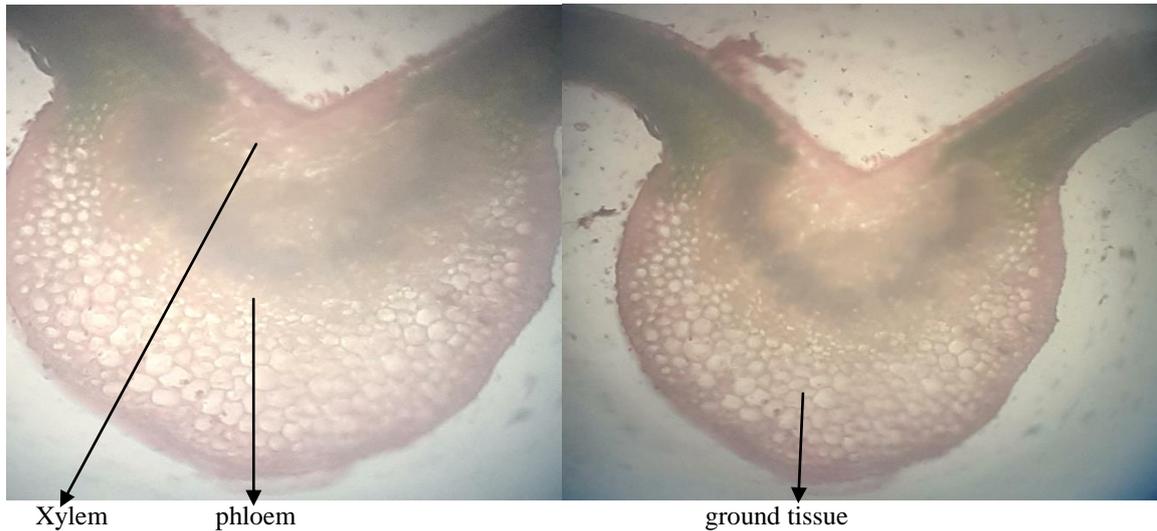


Fig-1: Microscopy of *Punica granatum*. leave.

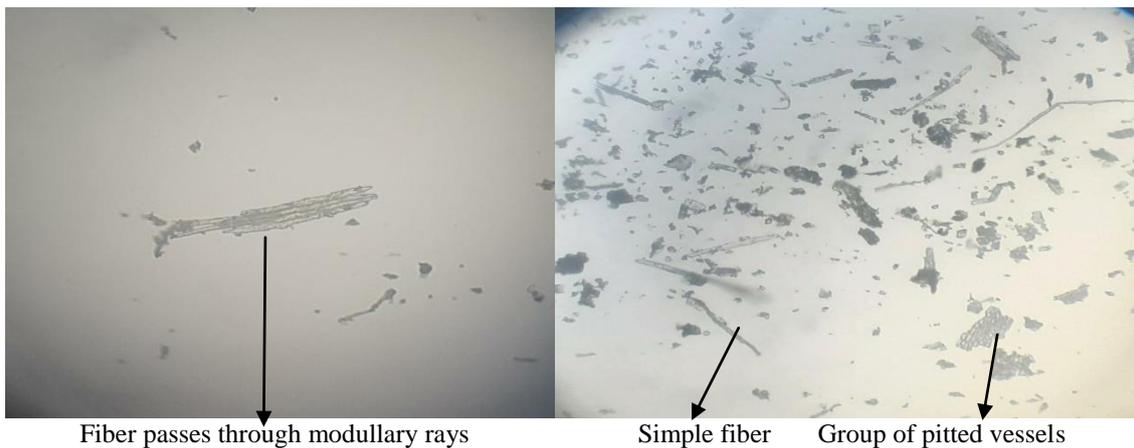


Fig-2: Powder microscopy of *Punica granatum*. leaves.

CONCLUSION

Preliminary physico-phytochemical study of the *Punica granatum* study concluded to macroscopic, other physical values and parameters will help to identify the species of plant, phytochemical screening will help the presence of compounds, Microscopy is an important tool in the evaluation of crude drugs which is applicable at various levels such as the authentication of the crude drugs, study of powdered drugs, study of T.S. *Punica granatum* is known as wide range of medicinal value, it helps to identification, authentication and standardization. It also require to research on phytochemical and pharmacological aspect. However research going on it would be easier to develop new formulation.

Compliance with ethical standards

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Conflict of Interest

All the authors hereby disclose no conflict of interest.

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