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Research Article

ACTIVE COMPOUNDS OBSERVATION IN POMEGRANATE PEEL

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ABSTRACT

Pomegranate (Punica granatum) is grown in tropical and subtropical regions of the world. The total area under cultivation of pomegranate in India is 107.00 thousand ha and production is around 743.00 thousand tons. Maharashtra is the leading producer of pomegranate followed by Karnataka, Andhra Pradesh, Gujarat and Tamil Nadu. This plant is grown as small trees or shrubs in various countries like Iran, Iraq, Afghanistan, Pakistan, India, Russia and Mediterranean region. Mainly Pomegranate plant plays a vital role in medicinal treatments; it cures different diseases like cancer, stomach disorder, diabetes, anemia and dysentery. From the peel extract the tests were carried out to find the presence of the following chemical compounds such as carbohydrates, reducing sugars, glycosides proteins, amino acids, phenolic compounds, tannins, alkaloids, flavonoids, saponins, sterols,etc. This paper shows an evaluation of pomegranate peel extract using different chemicals.

Keywords: Specific chemicals, assessment and plant extracts.

1. INTRODUCTION

The total production of pomegranate around the world is 1,800,000 tons, in that 65% is the weight of the peel itself. The entire plant has medicinal property , the seeds and juice cure throat problems, eye dieses, gum bleeds, toning skin, cancer, cardiovascular disease, diabetes, infant brain ischemia and male infertility [1,2].Polyphenolic amount is rich in this fruit. Phytochemical compounds such as gallotannins, ellagic acid, gallic acid, punicalins, punicalagins present in pomegranate peel proved by researchers[3,4].Comparitively the antioxidant property of pomegranate juice is higher than other fruit juices, grape wine and herbal tea.

1.1.Plant profile

Botanical name: Punica granatum L

1.2.Taxonomical classification

Kingdom: Plantae
Division: Magnoliophyta
Class: Magnoliopsida
Subclass: Rosidae
Order: Myrtales
Family: Punicaceae

Tannins and Flavanoids are phenolic compounds and plant phenolic is a major group of compounds that act as Basic antioxidants or free radical scavengers[5]. Saponins have hypotensive and cardio depressant properties[6].Glycosides is naturally a cardio active drug used in the treatment of congestive heart failure and cardiac arrhythmia[7]. The screening test used to find the bioactive compounds based on the chemical compounds present lead for the drug discovery and development. Pomegranate peel extract test reports were tabulated with different peel extracts and comparative study was done.

2. MATERIALS AND METHODS

2.1. Extract Preparation of crude peel juice

Pomegranate peel was separated manually from the fruit and washed using water and crushed using hydraulic laboratory to get the juice. Then the juice was concentrated using freeze-dryer, filled in dark bottles at -8^{0}C until use[8].

2.2. Preparation of aqueous extract

The peel powder was boiled 20-30 min using distilled water, kept overnight at room temperature, then it's filtered and filtrate was evaporated by keeping it in hot air oven stored in a refrigerator. The concentrated sample was used for screening test[9].

2.3. Preparation of Ethanol, chloroform extract

Pomegranate peel was dried at 80-100 ^{0}C in a hot air oven for a week. Using mixer grinder it was powdered and extraction was carried out using soxhlet apparatus by taking 99% ethanol and chloroform for 24 hours. The solution was evaporated and dried using rotary flash evaporator and stored in refrigerator. At last the screening test was performed using condensed extracts[9].

The following tests were carried out to find the presence of chemical compounds namely carbohydrates-Molisch's test; amino acids-Ninhydrin's test; proteins-Xanthoproteic test; tannins-Ferric chloride test; alkaloids-Wagner's test; flavonoids-Lead acetate test; saponins-Froth's test; glycosides-Keller kiliani's test; phenolic compounds –Ferric chloride test and sterols –Salkowski's test[10]. Presence oF chemical components in the aqueous, ethanol, chloroform peel extracts was confirmed by the following tests for Carbohydrates-Benedict's test; amino acids- Ninhydrin test; proteins-Biuret test; tannins-Gelatin test; alkaloids-Hager's test; flavonoids-Ferric chloride test;Saponins-foamglycosides-;keller-killiani,Triterpenoids&steroids-Libermann Burchard test [9].

3. DISCUSSION OF COMPARISON RESULT

Most of the time experiments are carried out to obtain good result. But to achieve the same many chemicals are used. For the observation test many chemicals were utilized but at least while preparing plant extracts we can avoid the chemicals, so that the medicinal properties of plants can be explained well. The (+) sign represents the presence of chemical compound and (–) sign represents the absence of chemical compounds.

Table 1:

Experiment	Observation	Inference Peel
Molisch's test	Carbohydrates	+++
Benedicts'test	Reducing sugars	+++
Keller-Kiliani's test	Glycosides	+
Xanthoproteic test	Proteins	++
Ninhydrin's test	Amino acids	++
Ferric chloride test	Phenolic compounds	+++
Ferric chloride test	Tannins	++
Wagner's test	Alkaloids	+
Lead acetate test	Flavonoids	++
Froth's test	Saponins	+
Salkowski's test	Sterols	+
Saponification test	Fixed oils	-

The notations ,+++,++,+ and –refer to appreciable amounts (positive within 8 min); moderate amounts(positive after 10 min but within 15 min);trace amounts(positive after 15min but within 20 min) and completely absent, respectively .

According to the table-1 result except fixed oils the result found for all the chemical compounds were +(i.e. present).

Table 2:

Chemical test	Peel extract		
	Ethanol	Aqueous	Chloroform
I. Test for Triterpenoids & steroids			
Liebermann Burchard Test	-	-	+
II. Test for Glycosides			
Keller Kiliani Test	-	++	+
Bromine water	-	+	++
III. Test for Saponins			
Foam test	-	-	-
IV. Test for Alkaloids			
Hanger's test	-	-	-
V. Test for Flavanoids			
Ferric Chloride test	+	++	-
Alkaline reagent test	+	+	-
Lead Acetate solution test	++	+	-
VI. Test for Tannins			
Gelatin test	+	-	-
VII. Test for Proteins			
Biuret test	-	-	-
VIII. Test for Free amino acids			
Ninhydrin Test	+	+	-
IX. Test for Carbohydrates			
Benedict's Test	+	+	-
X. Test for Vitamin C			
DNPH test	-	+	-

4. Comparative statement table

Chemical compounds	T-1	T-2	Peel extract			
			Crude	Ethanol	Aqueous	Chloroform
1.Carbohydrate	Molisch's test	Benedict's test	+++	++	+	-
2.Reducing sugar	Benedict's test		+++			
3.Glycosides	Keller-Kiliani's test	Keller-Kiliani test	+	-	+	+
4.Proteins	Xanthoproteic test	Biuret test	++	-	-	+
5.Amino acids	Ninhydrin's test	Ninhydrin test	++	-	-	-
Phenolic compounds	Ferric chloride test		+++			

Tannins	Ferric chloride test	Gelatin test	++	+	-	-
Alkaloids	Wagner's test	Hager's test	+	-	-	-
Flavonoids	Lead acetate test	Ferric chloride test	++	+	+	-
Saponins	Froth's test	Foam test	+	-	-	-
Sterols	Salkowski's test		+			
Fixed oils	Saponification test		-			
Test for Triterpenoids &Steroids		Liebermann Burchard test		-	-	+
Test for vitamin C		DNPH test		-	+	-

In the aqueous peel extract of pomegranate Glycosides, flavonoids and carbohydrates were present. Triterpenoids, steroids, saponins, alkaloids, tannins, proteins and amino acids were absent.

In the Ethanol peel extract flavonoids, tannins and carbohydrates were present, triterpenoids, steroids, glycosides, saponins, alkaloids, proteins, amino acids and Vitamin C were absent.

In the chloroform peel extract triterpenoids and steroids were present.

In table 2 the better response was observed for aqueous and ethanol peel extracts but when compared table (2) with table (1) the better response for chemical compounds were found in crude peel extract.

5. CONCLUSION

The medicinal property of plants is based on their chemical constituent. According to the above report crude peel extract shows more positive results for the chemical compounds than the aqueous, ethanolic and chloroform extracts. Most of the tests were carried out with dried plant powder using soxhlet apparatus for the extraction preparation, but in some cases the crude plant extract was used.

The preparation of crude plant extract requires less time. For the ethanol, aqueous and chloroform extract preparation, dried plant powders are used. Drying the plant takes more time. The direct observation tests using crude plant extracts are safe, immediate response is received .After drying the plant, chemical component's response comparatively very less. Moreover usage of chemicals can be minimized by using crude plant extracts**.**

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