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STUDY OF PREPARATION OF QUALITY POMEGRANATE WINE THROUGH ADJUSTMENT OF SOME COMPOSITION INDICATORS

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ABSTRACT
Cultivated pomegranate plants consist of bushes 2-3 m high, and in some warm regions, larger trees. Almost all parts of the pomegranate plant, i.e. fruit, flower, leaf and stem as well as the root, are used for various purposes. Fruits are used both fresh and in the form of processed products. Conducted researches show that the peel, rind, seed, and inter-partial membranes are very valuable in addition to the juice of the fruit due to its chemical composition.
Keywords: pomegranate, antioxidant, variety, grape, alkaloid, juice, wine, coupage.

Introduction

Pomegranate belongs to the Punicaceae Horan family, from the genus Punica L.There is two species: Punica granatum L. and Socotra protopunica Belf.

Normal pomegranate (P.granatum L) is found wild in our country. There are several varieties of pomegranate that are ornamental and widely used in ornamental gardening. Pomegranate is cultivated today in many different microclimate zones in subtropical and tropical areas around the world. As it easily adapts to different climatic and soil conditions, it is a fruit that is grown in a wide range of areas, from Australia to South Africa, from the United States to China. Although some sources consider the territories of Iran, the Caucasus and North India to be the home of the pomegranate, the pomegranate has been grown in Anatolia and all the Mediterranean basins for a long time.

4,500,000 tons of pomegranate production is done in the world. In pomegranate production, India's share is 45%, Iran's share is 28.2% and share of China is 28%. Turkey is at the forefront of pomegranate production and export among the Turkic World and neighboring countries.Tunisia, Morocco, Israel in the Mediterranean basin, Azerbaijan, Georgia in the Caucasus, Tajikistan, Kyrgyzstan in Central Asia, Argentina, Australia, South Africa and Peru in the southern hemisphere are leading countries engaged in pomegranate production.There are about 500 varieties of pomegranate in the world (60 of them are commercial varieties), 70 of them grow in Azerbaijan. Azerbaijan ranks first in the world in terms of pomegranate variety and quantity of pomegranate varieties. These varieties differ from each other in terms of morphological and biological characteristics, fruit quality, and growing time. Among the economic regions that produce pomegranates in Azerbaijan, pomegranate varieties are distributed as follows:

In Ganja-Kazakh region "Çəhrayı gülöyşə", "Bala Mürsəl", in Lankaran "Çəhrayı gülöyşə",

“Azərbaycan gülöyşəsi”, “Nazik qabıq”, “Vələs”, “Oleq”, “İrigilə” species are spreaded more.

In the Guba-Khachmaz economic region, there are more varieties of “Azərbaycan gülöyşəsi” and “Nazik qabıq nar”.

In the Aran economic region and in Shirvan region, “Çəhrayı gülöyşə”, “Bala Mürsəl”, Azərbaycan gülöyşəsi”, “Nazik qabıq nar”, “Vələs”, “Oleq”, “İrigilə”, etc. cultivars are cultivated [1].

Literature summary

Research shows that environmental conditions affect fruit color, taste, and antioxidant capacity [2] . Pomegranate is reflected in the holy books of almost all religions and has been used for the treatment of various diseases for centuries. The traditional importance of pomegranate as a medicinal plant is linked to the fact that the fruit has important antioxidant, anti-inflammatory and anti-carcinogenic properties, and new scientific data has emerged to prove this [3]. Pomegranate is a rich source of hydrolyzed tannins or ellagitannins, catechins, gallocatechins and anthocyanins. The combination of different types of polyphenols makes pomegranate antioxidants different from other antioxidants (such as Vitamin A or C). Thus, these antioxidants have a broader effect against several types of free radicals rather than just one [4]. (Figure 1).

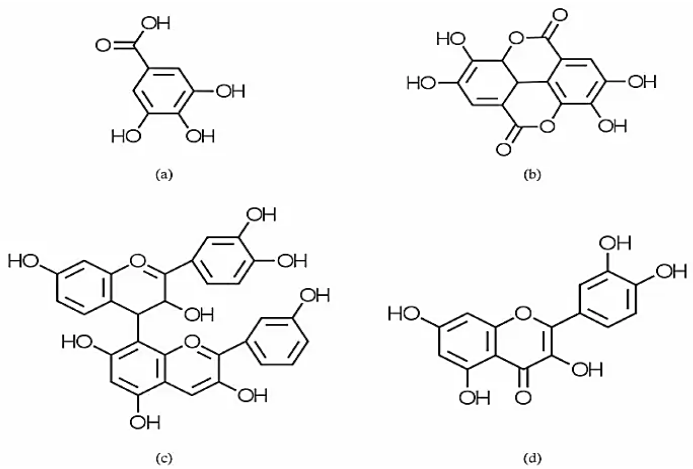


Figure 1. a) Gallic acid, b) Ellagic acid, c) Tannin d) Flavonoidin .

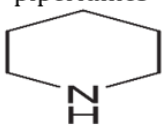
From the analysis of literature materials, it was found that sucrose is present in a small amount - between 0.18÷0.31% in pomegranate juice. The quality of pomegranate is mainly characterized by its acidity. It is known from the researches of Professor A.S. Garasharli that pomegranate juice contains 1.72÷2.60% total acidity, and about 90% of it is composed of citric acid [5].

Anthocyanidins in pomegranate usually exist as glycosides with the aglycones of delphinidin, cyanidin, and pelargonidin, while the flavan-3-ols found in this plant exist only in the non-glycosidic form, including catechin, epicatechin, epigallo-catechin, and their derivatives. Flavones and flavonols are the major flavonoids of the pericarp (bark) and leaves, often present as glycosides with the aglycones of luteolin, kaempferol, quercetin, apigenin, and naringin [6].

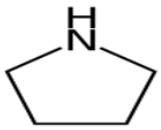
The peel of pomegranate varieties grown in Azerbaijan differs from fruits grown in other zones in that it contains a high amount of tannins (up to 33.12%) [5].

Alkaloids were mainly found in the bark of pomegranate branches and in pomegranate juice. These are of two types:

piperidines



pyrrolidines

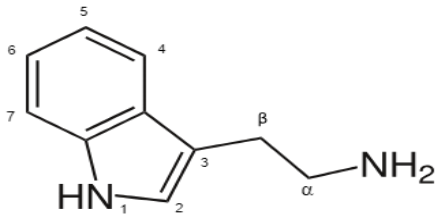


Typically, the skeleton of piperidines has a six-membered ring, while the skeleton of pyrrolidines has a five-membered ring. Both types and composition of piperidines are more than pyrrolidines. Piperidines are the main alkaloids of stem bark in both stem and root bark, such as isopelletierine, pseudopelletierine, and N-methylisopelletierine [7],

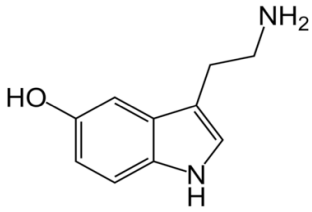
Lysine is first converted to tetrahydropyridine through a series of reactions including oxidation, decarboxylation. Then with aceto-acetyl-coenzyme A to isopelletierine condensation is being Isopelletierine this your way arm is the point . Isopelletierine of their products methylation of N- methylisopelletierin more after this in the plant various to piperidines becomes , isopelleterin else one of tetrahydropyridine molecule with condensation other plant in types anapherine gives.

In pomegranate juice which is alkaloids

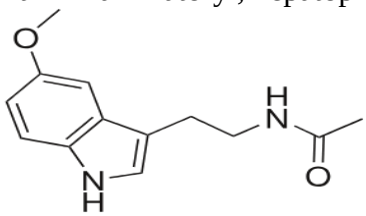
1. Tryptamine



2. Serotonin has an antioxidant effect



3. Melatonin antioxidant has anti- inflammatory , hepatoprotective effect



The antioxidant activity of pomegranate juice is significantly higher than the well-known antioxidants red wine and green tea and is attributed to its polyphenol content. A number of compounds have been identified in the bark, mesocarp and arils, including anthocyanins,

gallotannins, ellagitannins, gallacyl esters, hydroxybenzoic acids, hydroxycinnamic acids and dihydroflavonol. -hexoside has only recently been reported. Ellagitannins are the predominant phenolics, and punicalagin, the typical ellagitannin of pomegranate, has concentrations of 11–20 g/kg in the mesocarp and peel, and 4–565 mg/l in the juice.

Research object and methodology

Pomegranates, grapes, juice, wine, crushed grapes, dried grapes and various technological methods are taken as research objects. The research is carried out according to the methodology according to the following sequence:

Pomegranate is washed, checked in the conveyor and cleaned of rotten pomegranates. Then it is mainly separated from the top shell in roller crushers. Separated pomegranate seeds are fed to a belt press together with partitions. Here, in order not to damage the pomegranate seeds, compression is done in a soft mode between two tapes. The obtained pomegranate juice is passed through a vacuum filter and rinsed. The sugar content of dry pomegranate juice is raised to 20-22% with powdered sugar and fermented by adding yeasts used for fermentation of grape juice. Fermentation is carried out at a temperature of 14-16^{o}C. After 15 days of fermentation, pomegranate wine samples are mixed with grape wine samples in the following proportions: option I - 90% pomegranate wine and 10% grape wine; option II - 80% pomegranate wine and 20% grape wine; Option III 70% pomegranate wine and 30% grape wine. The obtained samples are mixed well and left to rest in cold conditions for 24 hours. Then the composition is analyzed. At the Azgranata enterprise, the modern German production line and the laboratory equipped with modern equipment have created a favorable basis for research.

Analysis of research results

Since most of the phenolic compounds in pomegranate fruits are thought to be located in the skin and in the septa that separate the seeds (pericarp), pomegranate juices produced by a process in which the whole fruit is pressed contain high amounts of punicalagin, gallic acid, and ellagic acid. Pomegranate wines produced from such juice are expected to have high total acidity. Research has confirmed this thesis and the acidity of the pomegranate wine samples we prepared fluctuated between 1.2-1.5%. As a result of our research and surveys, it became clear that the main reason why pomegranate wine is not drunk by consumers at the level it deserves, as well as the low sales volume, is related to their composition. Thus, pomegranate wines produced in our country are usually characterized by high extract and especially sharp acidity.

It is known that pomegranate contains less sugar than grapes. Therefore, the wine material obtained from such raw materials has a density of 7-8% h. Powdered sugar, which is used to increase the sugar content of pomegranate juice and thus the darkness of the wine to be made, leads to a weakening of the exactness and fullness of the wine. At the same time, in addition to these, the high acidity of pomegranate wine has resulted in this wine not being well received by consumers. It is for this purpose that we conducted our research in Azgranata, one of the most modern enterprises of Azerbaijan. The availability of modern equipment required for making pomegranate juice at the enterprise allowed us to successfully conduct our research work. During our preliminary research, it became clear that the amount of pomegranate seeds added to pomegranate juice is reflected in its quality. In the research process, 3; We used 5 and 7% refined and unrefined pomegranate seeds. In all variants with the addition of tum, the acidity did not decrease, although the extractivity increased very little. Organoleptic analysis showed that we

cannot get high-quality pomegranate wine by increasing extractivity in this way. The reason for this was the process of further increase in taste. That is, hunger increased as the amount of unrefined dust increased. This allows us to say that one of the main reasons for the increase in bitterness is the solid particles located in the membranes between the berries and the juicy seeds inside the fruit. With this in mind, we have continued the research by removing the tumor.

The results of analyzes of the mixture of pomegranate wine and grape wine mixed in different proportions are shown in the table below.

Table 1. Composition indicators of wine material mixed in certain proportions.

Composition	Pomegranate wine	Grape wine	Pomegranate + Grape Wine 90 : 10%	Pomegranate + Grape Wine 80 : 20%	Pomegranate + Grape Wine 70 : 30%
Ethanol, in %	12,26	12.84	12,28	12.4	12.46
Sugar, grams/dm ^{3}	6.3	1.7	5.8	5.4	5.0
Titratable acidity, gram/dm ^{3}	15.7	5.2	14.0	12.8	11.2
Volatile acidity, grams/dm ^{3}	0.1	0.68	0.1	0.0	0.31
pH	2.54	3.96	2.67	2.8	2.94
Extractability, gram/dm ^{3}	29.6	19.0	26.3	26.9	25.6
Density, kg/dm ^{3}	0.9934	0.9923	0.9933	0.9930	0.9934
Citric acid, gram/dm ^{3}	2.25	0.01	2.01	1.82	1.54
Fructose, grams/dm ^{3}	0.00	0.2	0.0	0.0	0.00
Gluconic acid, gram/dm ^{3}	3.92	0.34	3.45	3.07	2.53
Glycerin, gram/dm ^{3}	12.4	8.2	11.9	11.5	10.8
Glucose, gram/dm ^{3}	0.0	0.0	0.0	0.0	0.0
Lactic acid, gram/dm ^{3}	1.5	2.2	1.5	1.5	1.6
Malic acid, gram/dm ^{3}	8.1	0.3	7.4	6,8	5.8
Methanol, mg/dm ^{3}	0	0	0	0	0
Tartaric acid, gram/dm ^{3}	3.5	3.7	3.5	3.5	3.6

In the results of the analysis, the change of ethyl alcohol changed according to the law. The change in titratable acidity in all variants when mixed with grape wine has a certain deviation when the acidity decreases by 0.1-0.3 grams/dm^3, an excessive decrease occurs. This allows us to say that as a result of the decrease in acidity, there is probably a certain process of apple milk acidification, which is the reason why the acidity decreases a little more.

According to the table, it can be said that in the coupage material with more grape wine added, the hydrogen indicator of the environment is lower. That is, the pH is closer to 3, which is more appropriate than the pH indicator of pomegranate wine, pH=2.54. That is, it is closer to stomach acid and makes the wine more drinkable.

Pomegranate wine contains 10 times more gluconic acid than grape wine. So, while in botrytis-infected grapes it is max 2, in our sample of pomegranate wine, this indicator is 3.92 grams/ dm^3. In the wine material obtained from the coupage with 30% pomegranate wine, this indicator approaches the indicator of grape wines.

Malic acid is one of the sharp acids that give pomegranate its main bitterness. While the malic acid in pomegranate wine in the table is 8.1 grams/ dm^3, it drops to 5.8 grams/ dm^3 after coupage with 30% red wine material. It is for this reason that the hardness of the coupling material decreases.

Based on the conducted research, the following conclusions can be reached.

Conclusion

1. When pomegranate wines are blended with grape wines in any proportion, it increases the taste and aroma of the newly blended pomegranate wine.
2. The wine obtained by mixing pomegranate wines with red grape wines is dyed in a darker and intense red color, enhancing the appearance of the product.
3. The reduction of titratable acidity up to 20% makes the obtained wines more harmonious, and enables them to be used in the future for the production of new wines.
4. As a result of the reduction of malic acid in cupping, and at the same time a certain amount of malic acidification (reduces by 0.1-0.3 grams/dm^3), the bitterness in wine decreases and it becomes a fuller wine.
5. As a result of coupage, the pH approach to the pH of stomach acid leads to an increase in the quality of the wine.

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TƏRKİBİNİN BƏZİ GÖSTƏRİCİLƏRİNİN TƏNZİMLƏNMƏSİ YOLU İLƏ KEYFİYYƏTLİ NAR ŞƏRABININ HAZIRLANMASININ TƏDQİQİ

Könül Vüqarqızı Baloğlanova[1], Vüqar Şahbabaoğlu Mikayılov[2], Ağayeva Təranə Səfər[3]

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XÜLASƏ

Mədəni şəkildə becərilən nar bitkisi 2-3 m hündürlüyündə kollardan, bəziisti rayonlarda isə daha iri ağaclardan ibarətdir. Nar bitkisinin demək olar ki, bütün hissələrindən,yəni, meyvə, çiçək, yarpaq və gövdə, həmçinin kökündən müxtəlif məqsədlər üçün istifadəedilir. Meyvələrdən həm təzə halda, həm də emal edilmiş məhsullar şəklində istifadə olunur.Aparılmış tədqiqatlar göstərir ki, kimyəvi tərkibinə görə meyvənin şirəsi ilə yanaşı qabığı,giləsi, tumu, həmçinin bölməarası pərdələri çox qiymətlidir.

Açar sözlər: nar, antioksidant, sort, üzüm, alkoloid, şirə, şərab

ИЗУЧЕНИЕ ПРИГОТОВЛЕНИЯ КАЧЕСТВЕННОГО ГРАНАТОВОГО ВИНА ЧЕРЕЗ РЕГУЛИРОВКУ НЕКОТОРЫХ ПОКАЗАТЕЛЕЙ СОСТАВА

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АБСТРАКТ

Культурные растения граната представляют собой кусты высотой 2-3 м, а в некоторых теплых регионах и более крупные деревья. Почти все части растения граната, то есть плоды, цветы, листья и стебли, а также корень, используются для различных целей. Плоды используются как в свежем виде, так и в виде переработанной продукции. Проведенные исследования показывают, что кожура, кожура, семена и межчастичные оболочки имеют большую ценность, помимо сока плодов, благодаря своему химическому составу.

Ключевые слова: гранат, антиоксидант, сорт, виноград, алкалоид, сок, вино, купаж.