



Section 4. Food processing industry

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ANALYSIS OF OILS OBTAINED BY THE PRESSING METHOD FROM FRUIT GRAINS

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Abstract

In this article, the physico-chemical properties of apricot, peach and bitter almond seeds were studied, based on which research was conducted on the extraction of amygdalin oil. Oils were obtained by extracting the core of the grains, and these were analyzed and their physico-chemical properties were determined. Also, the process of extracting oil from peach, apricot and bitter almond seeds by pressing method was studied, the physico-chemical properties of apricot, peach and bitter almond seeds were studied, and research was conducted on the extraction of amygdalin oil based on them. Apricot, peach and bitter almond oils have been proven to contain more than 88.0% of unsaturated fatty acids, and more than 20% of unsaturated fatty acids are highly unsaturated essential fatty acids – linoleic and linolenic acids.

Keywords: *apricots, peaches, almonds, seeds, oils, saturated and unsaturated fatty acids, fruits and vegetables, acid number, saponification number, density, moisture, oil yield*

Introduction

It is known that horticulture is developed in Uzbekistan, and the amount of fruits and vegetables grown is increasing year by year. 50% of grown grapes, fruits and vegetables are processed in various ways (drying, canning) (Artikov, A. A., Safarov, A. F., Shomuro-

dov, T. R., Gafurov, K. H., 1991). As a result of such treatment, a large amount of waste, grape seeds, fruit seeds are formed. This waste is an important raw material for the oil industry.

Naturally, during the processing of fruits and vegetables, waste with nutrients is generated (Baymetov, K. I., Turdieva, M. K., Naza-

rov, P., 2011). These wastes can be different depending on the type of fruits and vegetables. Such edible waste can include seeds, pulp, pulp, pulp, etc., which are separated from the processing of fruits and vegetables. Consumable waste generated during processing of fruits and vegetables in most cases makes up 40–50% of the mass of processed raw materials (Agricultural Encyclopedia, 1953). Edible fruit and vegetable waste contains carbohydrates, proteins, fats, minerals, vitamins, dyes, and pectin, just like raw materials. Therefore, these wastes are valuable raw materials for extracting active substances from them.

The kernels of fruit seeds are very rich in fats, the amount of fat in them is 45–50 percent. Due to the presence of unsaturated fatty acids in peach, almond, apricot kernel oil, this oil is quickly digested in the body (Ginzburg, A. S., Gromov, M. A., Krasovskaya, G. I., 1980). The amount of essential amino acids in the protein of fruit kernels is 26–30% of the total amount of amino acids. At the same time, fruit pulp protein contains useful substances such as phenylalanine and tyrosine, unique amino acids that participate in the formation of thyroxine and adrenaline hormones in the human body. It is known that as a result of a violation of the exchange of these amino acids in the human body, the metabolism of the whole body is disturbed.

Apricot, almond and peach kernels are rich in minerals, especially sodium and magnesium. Therefore, it is possible to use almond kernel as an additional raw material for the produc-

tion of some products with high nutritional and biological value, enriching their content. Fruit seeds contain 40–50% oil, and due to the presence of unsaturated fatty acids in its composition, this oil is quickly digested in the body (Yadrov, A.A. 1975; Yadrov, A.A., Popok, N.G., Chernobay, I.G. 1999; Shcherbakov, V.G., Lobanov V.G., 2016). Such oils and cotton lead to the use of a small amount of alkali and adsorbent in the refining of oils (Akhmedov, A.N., 2019; Akhmedov, A.N., Abdurakhimov, S.A., 2018; Akhmedov, A.N., 2012).

Materials and methods

The scientific article uses generally accepted and special organoleptic, physico-chemical, microbiological and biochemical analysis methods for determining the properties of raw materials and finished products. Also, the composition and physico-chemical indicators of raw materials, methods of analysis of raw materials used in pressing, statistical processing of the obtained data and methods of error estimation are presented.

Results

The physico-chemical properties of apricot, peach and bitter almond seeds were studied, and based on them, research was conducted on obtaining amygdalin oil. Kernels were separated and oils were obtained by extraction method. The obtained oils were analyzed and their physicochemical properties were determined and are listed in Table 1.

Table 1. *Physico-chemical parameters of oils obtained by extraction method from fruit kernels*

Oil type	Density, g/ml (15 °C)	Refractive index (20 °C)	Acid number, mg KOH/g	Content of moisture and volatile substances, %	Oil output, %
Apricot	0.908	1.472	1.9	0.2	38.8
Peach	0.912	1.470	2.1	0.2	38.5
Bitter almonds	0.912	1.471	2.1	0.3	46.4

Table 1 shows that the physicochemical properties of apricot, peach and bitter almond kernel oils are very close to each other. They can differ from each other only structurally and with fatty acid composition. Processes of oil extraction from peach, apricot

and bitter almond seeds by pressing method have been studied. The obtained results are shown in Table 2.

Table 2. *Physico-chemical parameters of oils obtained by pressing method from fruit kernels*

Nº	Indicator name	Apricot	Peach	Bitter almonds
1.	Refractive index, n _D =20 °C	1.472	1.470	1.471
2.	Density, g/ml, 25 °C	0.908	0.912	0.912
3.	Saponification number, mg KOH/g	191	190	192
4.	Iodine number, g J ₂ /100 g	101	100	100
5.	Peroxide number, mole of active oxygen	2.82	3.0	3.85
6.	Acid number, mg KOH/g	1.7	1.3	1.1
7.	Content of moisture and volatile substances,%	0.4	0.5	0.4
8.	Oil yield,% relative to kernel	29.6	29.3	27.8

It can be seen from Table 2 that the acid number of the oils obtained by the pressing method is lower compared to the oils obtained by the extraction method. Apricot oil has a higher iodine value than peach and bitter almond oils, indicating that it contains

more saturated fatty acids. However, a higher refractive index indicates that it may contain more unsaturated fatty acids. Therefore, the fatty acid composition of the obtained oils was analyzed (Table 3).

Table 3. *Fatty acid composition of oils obtained from fruit seeds*

The name of the acid	Oil type,%		
	Apricot	Peach	Bitter almonds
Palmitin	5.56	4.93	6.35
Stearin	1.94	2.18	2.05
Olein	63.76	61.46	68.6
Linol	26.15	26.44	20.11
Linolene	1.01	0.10	0.38
Arachnid	0.50	0.46	0.19
Other	1.08	4.43	2.32
Total	100	100	100

From the data in Table 3, it can be seen that apricot, peach and bitter almond oils contain more than 88.0% unsaturated fatty acids. More than 20% of unsaturated fatty acids are highly unsaturated essential fatty acids – linoleic and linolenic acids.

Discussion and Conclusion

The kernels of fruit seeds are very rich in fats, the amount of fat in them is 45–50 percent. Due to the presence of unsaturated fatty acids in peach, almond, apricot kernel oil, this oil is quickly digested in the body.

The amount of essential amino acids in the protein of fruit kernels is 26–30% of the total amount of amino acids. The physico-chemical properties of apricot, peach and bitter almond seeds were studied, and based on them, research was conducted on obtaining amygdalin oil. As a result, it was found that the physico-chemical properties of apricot, peach and bitter almond kernel oils are very close to each other, they can differ only structurally and fatty acid content.

Processes of oil extraction from peach, apricot and bitter almond kernels were stud-

ied and showed that the acid number of the oils obtained by the pressing method was lower than that of the oils obtained by the extraction method. It can be concluded from the research that apricot, peach and bitter al-

mond oils contain more than 88.0% of unsaturated fatty acids, and more than 20% of unsaturated fatty acids are highly unsaturated essential fatty acids – linoleic and linolenic acids.

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