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THE ROLE OF THIN LAYER CHROMATOGRAPHY IN THE ANALYSIS OF VEGETABLE OILS

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Abstract

As a result of the work carried out, using the thin-layer chromatography-TLC method, the group composition of oils isolated from some melons was identified, and then their quantitative assessment was carried out. The possibility of using the TLC method for assessing the group composition and authenticity of vegetable oils is shown. Watermelon, melon and pumpkin oils were chosen as vegetable oils.

This approach can be used in the standardization of the quality of oils and in the development of regulatory documents for oils.

Keywords: Sorbent, phase, eluent, stains, lipid, distribution coefficient, color.

Introduction

The main component of oils is fatty acids, which are very important and have a significant impact on their properties. Although the number of fatty acids that make up fats is much higher, the number of regular fats does not exceed 8-12. Oils often contain the following acids: saturated myristic, palmitic, styarine, arachic, begen and unsaturated palmitolin oleic, linoleic and linolenic acids. [1].

In addition to triglycerides, fats and oils contain waxes, phosphatides, phospholipids, cholesterol, cholesterol, carbohydrates, tocopherols, free fatty acids, vitamins and other substances that give oils their unique properties. The main biological value of vegetable oils is determined by the amount of polyunsaturated fatty acids, phosphatites, tocophytes and other substances. [2].

Vegetable oils include cotton, sunflower, apricot, grape, peach, coconut, corn, sesame, sesame, flax, almond, olive, soy, walnut, watermelon, melon and other pumpkin seeds. oils obtained from [3,4].

Extraction of oils from watermelon, melon and squash seeds from melons is one of the urgent tasks in this direction. This is based on the ability to grow, harvest and dry these plants, as well as the ability to extract from the seeds a complete set of vitamins, macro and micronutrients, polyunsaturated fatty acids by preservation. Watermelon, melon and pumpkin seed oils are mainly obtained by cold pressing. The extraction method also uses the oil extraction method. Extraction of oil is carried out on the basis of appropriate methods using chloroform, hexane and a number of other organic solvents. [5-7].

Melon oil is important for its complex of biologically active additives with high therapeutic properties and low cholesterol. Melon, watermelon and pumpkin seed oils normalize the acid-base balance in the blood and cells. Participates in the cleansing process in the body, enhances immunity, accelerates wound healing, reduces the risk of cancer.

They contain vitamins, biologically active substances, about 80-89% of polyunsaturated fatty acids [8-9]. These acids are important for the body and normalize the activity of the heart, blood vessels and brain.

In addition to glycerides, the group of oils contains the following compounds. [10] Free fatty acids are always present in fats. They are formed as a result of hydrolysis of fats during extraction and storage of oil.

Sterins are esters formed by high molecular weight polycyclic monohydric alcohols and their fatty acids. Phosphatides are esters of a mixture of glycerin with oil and phosphoric acid [11].

Lipochromes are dyes that color oils and fats, including chlorophyll, carotenoids, and gossypol, which is found in cottonseed oil.

Vitamins - Fats and oils are often in the form of vitamins A, C, E and others.

Chromogenic substances are organic substances that cause some color reactions of oils. These include sesame oil, sesame oil and cottonseed oil gossypol. All of the above compounds are called lipoids. Lipoids are soluble in fats and insoluble in water.

In addition to lipoids, fats and oils contain proteins and mucous substances, enzymes, hydrocarbons, essential oils, resins, high molecular weight alcohols, minerals and other substances. Oils are lighter than water, they are insoluble in water, low in alcohols, soluble in ethers, chloroform, gasoline, benzene and other organic solvents.

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Gas chromatography and high-efficiency liquid chromatography are widely used to assess the composition and quality of vegetable oils. However, the simplest and most informative method of determining the group composition of vegetable oils is thin-layer chromatography. [12].

The Experimental Part

Watermelon, melon, pumpkin vegetable oils, as well as a number of other fruit oil extracts were used to study the composition of the oils group. In our experiment, one-dimensional chromatography of lipids consisting of a research group of vegetable oils was performed by the Stal method [6, 7]. For this. 0.5 mg of vegetable oil was dissolved in chloroform and placed on an 8x5 cm Silufol plate. To do this, it was activated by washing the plate and drying at 110 ^{o}C using a mixture of solvents used as an elliptical. The hexane solution of the test oil was then instilled into the starting line of the Silufol plate using a chromatographic syringe and the light petroleum ether was diluted using a mixture of ether ethyl acetic acid in a ratio of 80: 20: 1. Stains of isolated lipid fractions were detected using an alcoholic solution of phosphorus-molybdenic acid. The chromatogram of watermelon oil extract obtained at YuQX is shown in Figure 1.

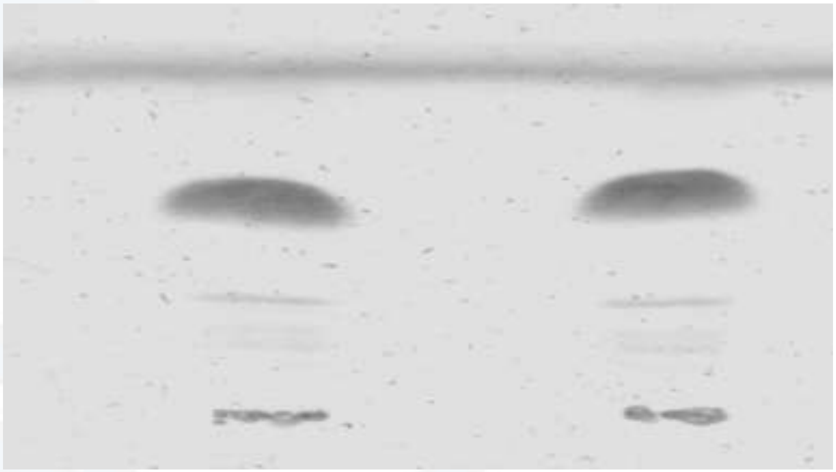

Figure 1. Chromatogram of watermelon oil extract obtained by YuQX method

Identification of spots by R_f value: triacylglycerides (TAG) on the front line of the solvent R_f=0,57±0,61; free fatty acids (FAS) R_f= 0,31±0,33; cholesterol 0.24 ± 0.28; phospholipids (FL)) R_f = 0,21±0,23; cholistyrol R_f = 0,17±0,20;

The qualitative composition of the group substances was determined by the value of the distribution coefficient R_f, and the quantitative composition was determined by the peak surface of the chromatogram. The results obtained are given in Table 1.

Table 1 Group composition of some melon vegetable oils

Moyning nomi	Fosfolipidlar	Xolistirin	Xolistirol	Erkin yog' kislotalar	Triglisiridlar
Tarvuz	0,70+0.20	0,60±0,21	7,31 ±0,84	0,82±(),23	89,52±2,14
Qovun	0,74 ± 0,21	0,55 ± 0,19	7,20±0,75	0,96 ± 0,27	87,87±2,34
Qovoq	0,75±0,19	0,61 ± 0,20	7,87±0,95	0,88 ± 0,30	85,70±2,68
Paxta	0,82±0,20	0,67±0,22	7,45±0,85	0, 97±0,25	86,85±2,40
Kungabo-qar	0,81±0,21	0,64±0,21	7,38±0,75	0,96±0,20	87,44±2,16

Results and their Discussion

Based on the results obtained by the YuQX method, the group composition of watermelon, melon and squash and other tested oils was determined. The results in Table 1 show that the vegetable oil extracts tested contained 5 fractions of neutral lipids: phospholipids, triglycerides, cholistirin, cholistyrol, and free fatty acids. From the data in Table 1, it can be seen that the main group of watermelon, melon and squash molars contain triglycerides, as well as oils extracted from all other plants. Melon oils are relatively low in phospholipids and cholesterol.

Neutral lipids in fats were found to be the main gistriglycerides, accounting for 89.52%. Thus, the advantage of the one-dimensional chromatography method of lipids is that it does not require long-term processing of expensive equipment and samples. In this study, the results obtained on the basis of the YuQX method for the determination of vegetable oils and oil extracts showed that the relevant vegetable oils can be used to determine the composition of the group, check their quality and authenticity, and develop relevant regulations.

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