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DETERMINATION OF THE ACUTE TOXICITY OF ASHUM AND ASCARAXUM FOOD ADDITIVES IN VIVO CONDITIONS

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Abstract

This article studies the chemical composition of thyme and Althaea officinalis seeds, as well as methods for extracting oils from the seeds of these plants in accordance with sanitary requirements using the DD85-G cold pressing apparatus. The results of determining the acute toxicity of oils and new food additives prepared on their basis in accordance with the OECD by intragastric administration to white mice are highlighted.

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INTRODUCTION. An analysis of oil extraction from the seeds of sedana and gulkhairi plants, distributed in the Andijan region of the Republic of Uzbekistan, was carried out.

Gulkhairi oil contains biologically active substances with healing properties,such as linoleic acid, oleic acid, and alpha linoleic acids ,along with their complex esters.[1].

Table-1

Organic acids that make up the oil of the Gulkhairi plant

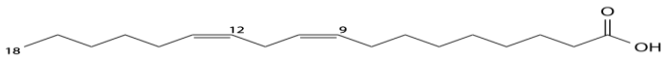
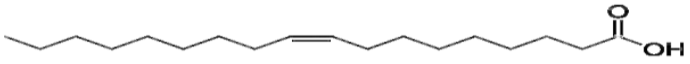
№	Substance name	The chemical structure of the substance	Percent (%)
1	Linoleic acid		52,8
2	Oleic acid		30,8
3	α-linoleic acid		2,5

Table 1 shows that sunflower oil is mainly composed of fats and fatty acids,which act mainly as external anti-inflammatory agents. Unsaturated fatty acids enhance this property [2].

Sedan oil. Its composition consists mainly of saturated and unsaturated fatty acids.

Table-2

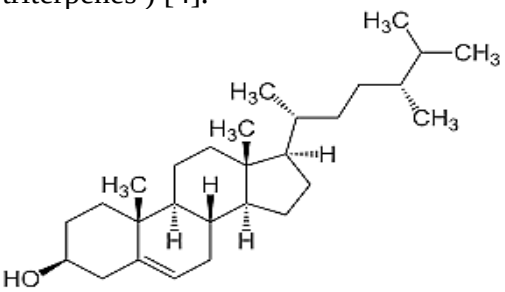
Fatty acids found in sedana oil

Trivial name	Systematic name	Acid formula

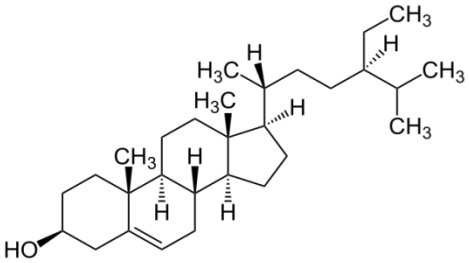
Saturated fatty acids		
Myric acid	Tetradecanoic acid	$C_{13}H_{27}COOH$
Pentadecyl acid	Pentadecanoic acid	$C_{14}H_{29}COOH$
Palmitic acid	Hexadecanoic acid	$C_{15}H_{31}COOH$
Margaric acid	Heptadecanoic acid	$C_{16}H_{33}COOH$
Stearic acid	Octadecanoic acid	$C_{17}H_{35}COOH$
Arachinic acid	Eicosane acid	$C_{19}H_{39}COOH$
Bexenic acid	Docasanic acid	$C_{21}H_{43}COOH$
Lignoceric acid	Tetracosanoic acid	$C_{23}H_{47}COOH$
Monounsaturated fatty acids		
Myristoleic acid	Cis-9-tetradecanoic acid	$C_{13}H_{25}COOH$
Palmitoleic acid	Cis-9-hexadecanoic acid	$C_{15}H_{29}COOH$
Oleic acid	Cis-9-octadecanoic acid	$C_{17}H_{33}COOH$
Polyunsaturated fatty acids		
Linolenic acid	Cis-,cis-9,12-octadecanoic acid	$C_{17}H_{31}COOH$
Linoleic acid	Cis-,cis-,cis-6,9,12-octadecanoic acid	$C_{17}H_{28}COOH$
Arachidonic acid	Cis-,Cis-,Cis-5,8,11,14-eicosotetradecanoic acid	$C_{19}H_{31}COOH$

Table 2 lists names and chemical formulas of fatty acids found in sedana oil using both trivial and systematic nomenclature [3].

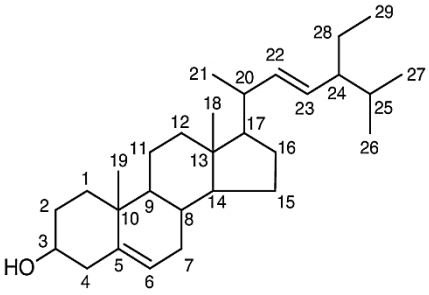
In addition, sedana oil contains active substances Omega-9 and Omega-6, amino acids(particularly arginine),phospholipids, phytosterols (campesterol, beta-sitosterol, stigmasterol, tannins, flavonoids, carotenoids, mono- and polysaccharides, enzymes, alkaloids, saponins and triterpenes) [4].



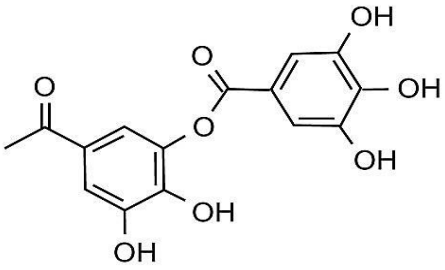
Campesterol



β-sitosterol



Stigmasterol



Stigmasterol

Figure 1. Formulations of phytosterols found in sedana oil.

We developed the following method for extracting oils from sedana and gulkhairi seeds in a sanitary manner. For this, the "DD85-G" cold pressing equipment manufactured by the German

company "AEN Engineering GmbH & Co.KG" was used. The fact that the maximum temperature being below 45° C ensures the preservation of the unique biochemical composition of the oils and important biologically active substances.

Sedana oil is a product obtained by pressing the seeds of the sedana plant. It is a yellowish-brown liquid with a slightly bitter taste and a specific smell.

Gulkhairi oil is a product obtained by pressing the seeds of the plant, a light-yellow liquid with a slightly sweet taste and a unique smell.

ASHUM is a mixture of sedana and gulkhairi oils in a ratio of 2:1.

ASKARAKHUM is a mixture of sedana and gulkhairi oils in a ratio of 4:1.

EXPERIMENTAL PART. Assessment of acute toxicity of the studied samples by intragastric administration was carried out in accordance with the OECD by introducing them to a group of animals of the same sex in a stepwise manner at fixed doses. Experimental studies of acute toxicity were carried out in sedana and gulkhairi oils and ASHUM and ASQARAKHUM food supplements prepared on their basis. The experiments were performed on male white laboratory mice with a body weight of 20±2.0 g. In the experiment, 5 mice were taken from each group, and their total number was 50

All pharmacological tests were carried out in healthy, sexually mature mice that passed the quarantine period of 10-14 days. Samples were once injected into the stomach of mice using a special probe (0.1 and 0.2 ml/mouse) in doses of 5000 and 10000 mg/kg. The animals of the control group were given an equal volume of purified water. On the first day of the experiments in laboratory conditions, the general condition of the animals of the research and control groups was observed every hour, possible tremors and death. During the next 2 weeks, in the vivarium conditions, the general condition, activity, fur coat, skin condition, breathing rate and depth, urine excretion, body weight change and other parameters of the animals were checked every day in all groups. All research animals were kept on the same usual diet, water and food were not limited. At the end of the experiment, the average lethal dose (LD50) and toxicity class of the examined samples were determined [5].

RESEARCH RESULTS OBTAINED. When sedana oil was administered to mice at doses of 5,000 and 10,000 mg/kg, no acute toxic effects were observed in animals. 10 minutes after administration at a dose of 10,000 mg/kg, the animals showed rapid breathing, hoarseness, and narrowing of the eyes,lasting 20-30 minutes before returning to normal as the control group animals. The experiments were followed for 14 days and no animal deaths were recorded at the above doses (5/0).

No side effects were observed in acute poisoning in animals when gulkhairi oil was administered to mice at doses of 5,000 and 10,000 mg/kg. 10-15 minutes after the introduction of this sample at a dose of 10,000 mg/kg, there was a slight acceleration in the breathing of the animals, the mice gathered in one place, and the eyes narrowed, this state lasted for 20-25 minutes, and they returned to the normal state. started, food and water intake became normal. No animal mortality was observed at either sample dose during the entire experiment (5/0).

When the ASXUM food supplement was administered to mice at a dose of 5000 and 10000 mg/kg, no acute poisoning effects were observed in the parameters above. Only 5-10 minutes after administration at a dose of 10,000 mg/kg, the animals showed increased breathing, concentration, narrowing of the eyes, this process lasted for 25-30 minutes, and the mice returned to a normal state. started, continued to drink feed and water. No animal deaths were observed at the above doses during the entire experiment (5/0).

When ASQARAKHUM food supplement was administered to mice at a dose of 5000 and 10000 mg/kg, the effects of acute poisoning were not observed in animals. 10 minutes after the introduction of Askaraxum at a dose of 10,000 mg/kg, the animals showed increased breathing, concentration, narrowing and narrowing of the eyes, this process lasted for 30-35 minutes, and the mice returned to normal condition and continued to drink water. When the experimental mice were observed for 14 days, no death of animals was noted at the above doses (5/0). Compared with the control group, the animals in the experimental groups did not lose body weight. The obtained results are presented in Table 3.

Table 3

Indicators of acute poisoning of sedana and gulkhairi oils, as well as ASXUM, ASQARAKHUM food additives based on them

Groups	Animal type, sex	Dose mg/kg, ml	Number of animals/ dead animals in the group	Average animal mass (1 day)	Average animal mass (7 day)	Average animal mass (14 day)	LD_{50}= with a confidence interval
Sedan oil	The mouse is male	5000	5/0	21	24	25	>10000 мг/кг
		10000	5/0	20	21	23	
Gulkhairi oil		5000	5/0	21	24	26	
		10000	5/0	21	23	25	
Asxum food additive		5000	5/0	21	22	25	
		10000	5/0	21	23	25	
Asqaraxum food additive		5000	5/0	20	22	24	
		10000	5/0	22	24	26	
Control		0,5 ml	5/0	22	24	26	-

Table 3 shows that our samples are non-toxic.

CONCLUSION: Based on the obtained results, it can be concluded that the oils of sedana and gulkhairi, as well as the ASXUM and ASQARAKHUM supplements derived from them, were administered to the stomachs of mice. According to the OECD classification, these compounds belong to Class VI, non-toxic substances, and the median lethal dose (LD_{50}) in mice was found to be greater than 10,000 mg/kg.

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