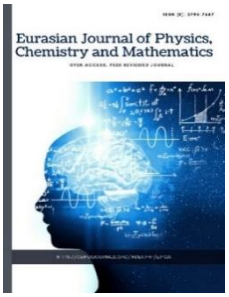

Separation of Complex Esters from Cuminum by Chromatographic Analysis Method

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ABSTRACT

The chemical composition of the ethanol extract of cuminum seeds was studied using chromato-mass spectrometry. 30 compounds were identified, for which mass spectra and structural formulas were obtained, the quantitative content of the latter was determined, and the structural group composition of the extract was calculated. The basis of the extract is alcohols with the dominance of dihydric, ketones, aldehydes, esters and ethers.

Keywords: Cuminum seeds, ethanol extract, chromato-mass spectrometry, structural formulas, hydrocarbons, alcohols, carboxylic acids, ethers and esters, lactones.

Introduction

Essential oils are considered volatile substances and there are 2500 tons of essential oils in the world. Their 650 species grow in Uzbekistan.

About 1000 components have been isolated from essential oils, which are considered hydrocarbons, alcohols, acids, ethers and esters, lactones and other chemically active compounds. essential oils are collected in flowers, fruits, leaves, motherworts, sometimes in the roots and in the pubescent part of the plant. These plants include basil, ziziphora, turaihan, valerian, sage, dill, coriander, mint and other herbs.

Antipruritic, bactericidal, antispasmodic, is part of sedatives and other medicines. They use them as a source of aromatic products in the industry.

The purpose of the study is a detailed study of the features of the structural organization of compounds that determine the chemical composition of the organic matter of cumin seeds using the example of its ethanol extract, using gas chromatography-mass spectrometry, expanding the set of individual compounds, in addition to those known in the scientific literature, to calculate the structural and group composition of the extract , in order to determine the quantitative ratio of various groups of components, to obtain their mass spectra and structural formulas; make an assumption about the direction of the pharmacological action of cumin seed preparations, taking into account the structural features of the compounds of its organic matter.

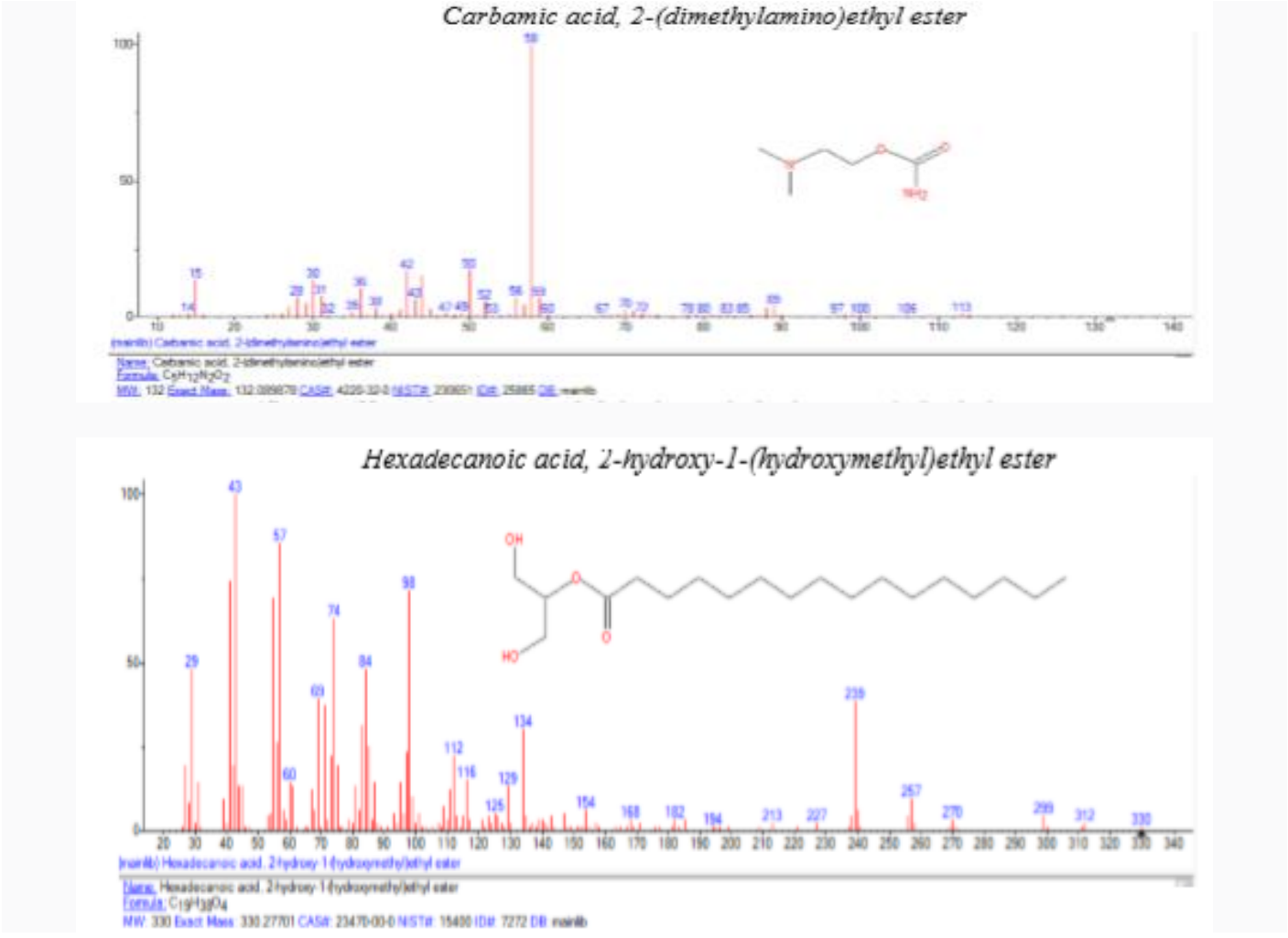
The medicinal raw material was the collected leaves after the flowering of cumin seeds. The chemical composition of mint leaves is determined by the content of mucus, the basis of which is determined by the high-molecular-weight polysaccharide mannan, which is hydrolyzed to mannose, as well as dextrins, starch, proteins, bitterness, pentosans,

methylpentosans, sugars, essential oil, and mineral salts [1–20]. A decoction of peppermint leaves helps regulate blood pressure. Another useful property is counteracting fermentation processes in the intestines, as well as stimulation of peristalsis.

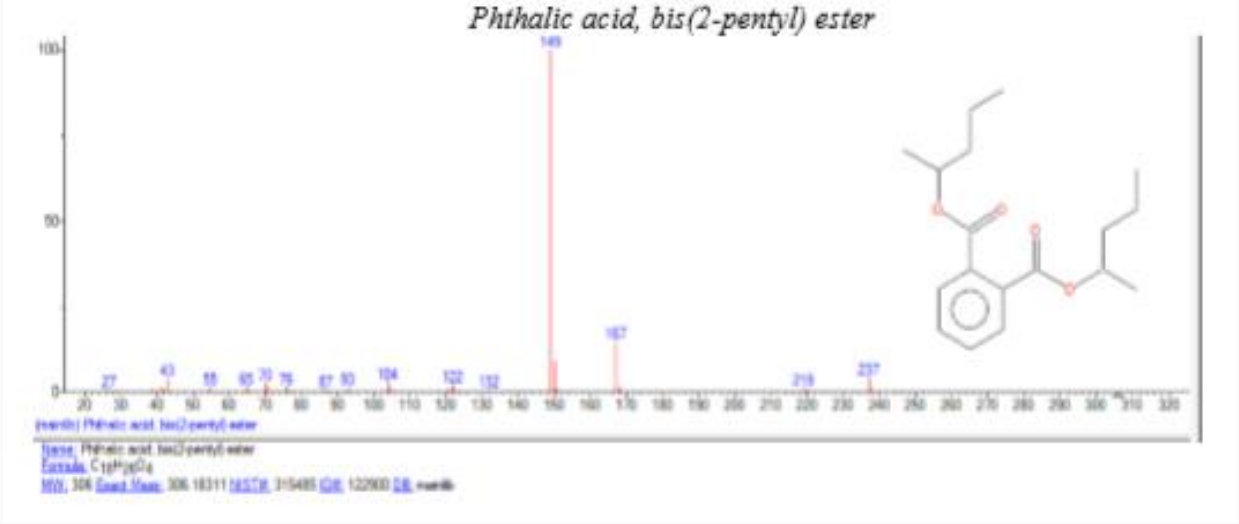
Methods and results

Due to the pronounced antiseptic action, it is actively used in various branches of medicine and even cooking. This effect is justified by the content of essential oils that inhibit spore-forming bacteria, such as Staphylococcus aureus. [1-10]. The object of the study was an ethanol extract of mint leaves, obtained by exhaustive extraction of the raw material with ethanol with a mass of 95% in the Sosklet apparatus. The extract was freed from ethanol in a vacuum rotary evaporator model RE-52AA Rotary Evaporator, the residue was weighed and its chemical composition was studied by chromato-mass spectrometry.

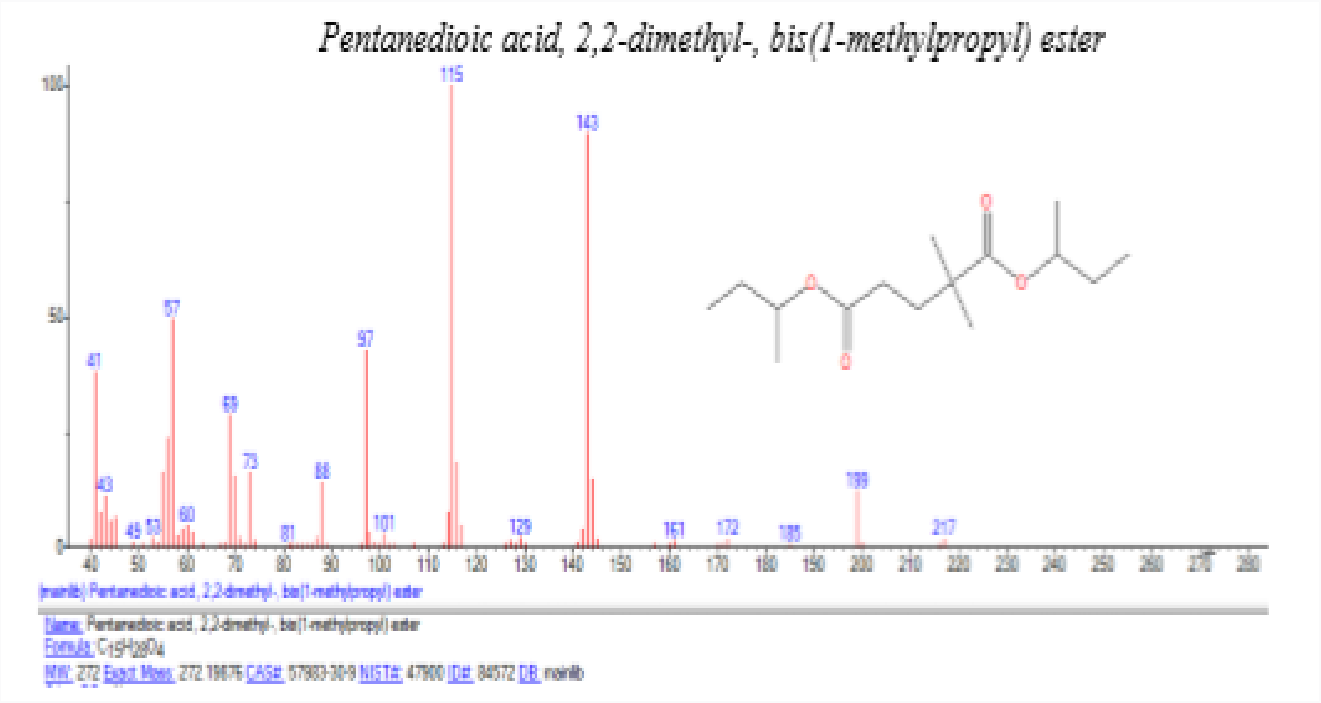
The structural organization of compounds of various natures in the ethanol extract is based on *Hexanoic acid, 2-oxo-, methyl ester, 2-Methylbutanoic anhydride, 2-Butenedioic acid, 2-methyl-, (E)-, Pentanedioic acid, 2,2-dimethyl-, bis(1-methylpropyl) ester, Carbamic acid, 2-(dimethylamino)ethyl ester, Phthalic acid, bis(2-pentyl) ester.*



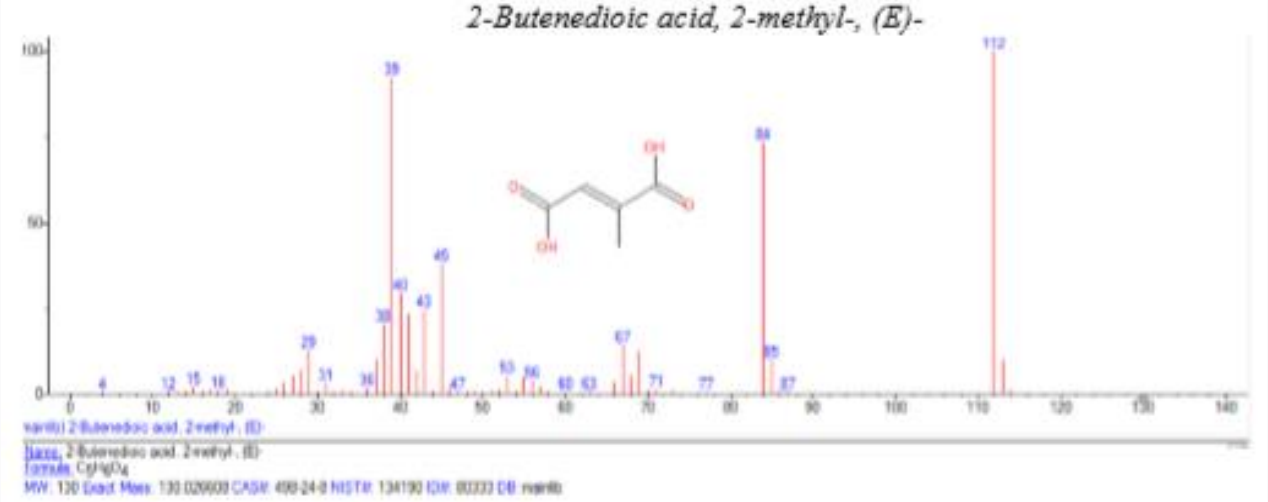
Phthalic acid, bis(2-pentyl) ester

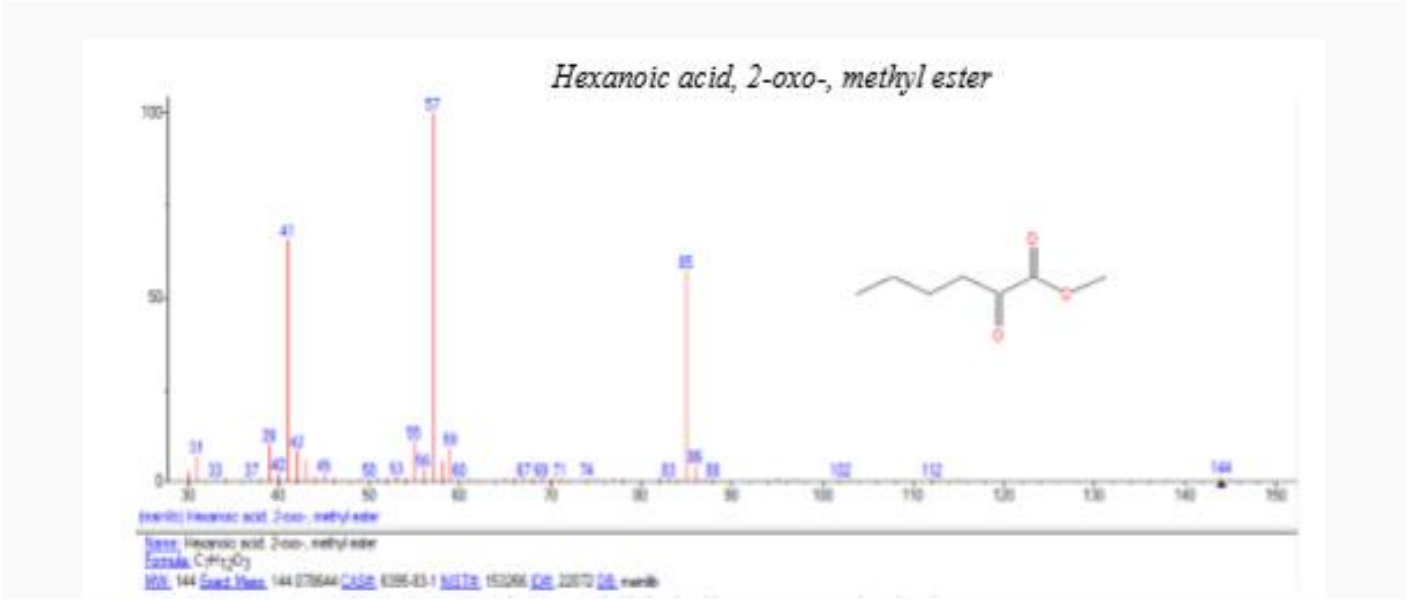


Pentanedioic acid, 2,2-dimethyl-, bis(1-methylpropyl) ester



2-Butenedioic acid, 2-methyl-, (E)-





Experimental part

In the mass spectra of aliphatic ethers, the molecular ion manifests itself as a weak signal, and for ethers, as an intense signal. The main direction of molecular ion fragmentation is bond cleavage between α- and β-carbon atoms and heterolytic cleavage of the C–O bond. As a result, ions with a mass (m / z) equal to 31, 45, 59 ... M-46, M-33 appear.

Conclusion.

For the first time, the chemical composition of the organic matter of Asian cumin seed average was studied in detail by the method of chromato-mass spectrometry, which made it possible to identify 30 individual compounds in its ethanol extract, for which the quantitative content was determined, mass spectra and structural formulas were obtained. The features of the structural organization of compounds that include fragments of furan, pyran, bi- and tricyclanes, arenes substituted with aldehyde, ketone, alcohol, ether and ester functional groups have been established. A significant proportion of nitrogen- and sulfur-containing compounds of various nature, phenols and glycosides are practically absent. Steroid compounds are represented by derivatives of cyclopentanoperhydrophenanthrene with alcohol and ketone groups. Some conclusions are made about the significant role of furan, pyran derivatives, as well as nitrogen- and sulfur-containing structures in shaping the direction of the pharmacological action of drugs based on caraway seeds.

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