CENTRAL ASIAN JOURNAL OF MEDICAL AND NATURAL SCIENCES

Volume: 02 Issue: 02 | March-April 2021 ISSN: 2660-4159

www. cajmns.centralasianstudies.org/index.php

STUDY OF THE CHEMICAL COMPOSITION OF ALLIUM OREOPRASUM ALCOHOLIC EXTRACT

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Received 2nd March 2021,
Accepted 28th March 2021,
Online 18th April 2021

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ABSTRACT: We studied the chemical composition of the alcoholic extract of Allium Oreoprasum by IR spectroscopy and GC-MS. It was revealed that the main components of the alcoholic extract of mountain onions are 5-hydroxymethylfurfural, 2 (1H) -Pyridinthon, glucopyranuronamid, melezitosa n-hexadecanoik kislota, 7.10-octadecadienoik kislota, Phthal kislota and other substances.

KEYWORDS: Allium Oreoprasum, extract, composition, IR spectrometry, GC-MS.

INTRODUCTION

Anzur onion has been known as a medicinal plant since ancient times. This is evidenced by the books: "Muhammad - Husayn ibn Muhamad - al - Okili", "Mahzan - ul - adviyya" (Treasury of medicines. 1777), "Karobo - dini - Kobir" (Great Pharmaceutical Fire), "Muhammad Azamkhon but nicknamed Jakhon" (Ordering the world), "Mukhiti Azam" (Great Ocean, 1860 -1865), which were published in India [1].

The medicinal plant Anzur is a source for obtaining various natural compounds, alkaloids, glucosides, coumarins and other substances. Due to the presence of anzur in the bulbs: sugars, vitamins and other organic substances, their inclusion in the diet has a beneficial effect on human health. On the other hand, anzur exhibit Anticancer, anti-inflammatory, immunomodulatory [2], antimicrobial [3], antioxidant [4], and cardioprotective [5] properties.

It is known that mountain onion (Allium oreoprasum) improves metabolism in the body, strengthens the immune system, helps in the treatment of inflammatory diseases, and improves impotence [6]. The listed properties of mountain onions are associated with the presence in the composition of phenocides, ascorbic acid, vitamins E and D, as well as other physiologically active compounds [2-7]. To elucidate the various useful properties of mountain onions is associated with the study of its thorough chemical

composition [8,9]. In this regard, a comprehensive study of the chemical composition of mountain onions is relevant from the point of view of both a medicinal plant and a food product.

PURPOSE OF WORK

Study the chemical composition of the alcoholic extract of mountain onions.

RESEARCH OBJECT AND METHODS

As the object of the study, we used mountain onions growing in the territory of Aman-kutan of the Urgut district of the Samarkand region, collected in October-November 2020. For research, the underground part (bulb) of the plant was exposed. The suspended sample was ground on a coffee grinder, passed through a sieve with a hole size of 0.3-0.5 mm, weighed 1 gram of the sample, placed in a flask with a stopper, poured in 30 ml of extractants. The extraction lasted from 2 to 5 days. The extracted samples were separated from the residues by filtration. Methanol, ethanol, butanol-1, acetone, toluene, hexane, and water were used as the extractant. The extracts were used for taking IR spectra and GC-MS analysis.

To take IR spectra, a WQF-510A spectrometer was used. Processing and analysis of spectrograms was carried out using FTOSPR software.

GC-MS analysis was performed on a YL6500 / 6900 GC MS instrument with a quadrupole detector with a wide dynamic range (from 1 to 1200 amu). Registration, processing of chromatograms, and identification of the separated components were performed using the YL-Clarity software.

The determination and identification of volatile organic compounds from the extracts were carried out under the following chromatographic separation conditions: Gas chromatography-mass spectrometer (GC-MS) 6500 / 6900MS by Young in Chromass; column - HP 5MS, 30 m (length) × 0.25 mm (inner diameter) × 0.25 μm (stationary phase thickness); injector temperature - 280 ° C; thermostat temperature program - 60°C (1 min) "25° C/min" 160 ° C "4°C / min" 240°C "10° C/min" 290°C (11 min); sample injection mode - splitless; sample injection pressure 250 kPa (1.5 min); constant linear velocity (40.0 cm/s); the volume of the injected sample - 2 μl; mass-selective detector interface temperature 280°C; ion source temperature 250°C; solvent elution time - 3 min; registration mode - SCAN/SIM-modes; mass scanning range - 50–500 amu; scanning speed 5000 amu/ s.

Peaks identified in the chromatogram were identified by the unique mass spectra of each component and by comparative searches with the American National Standards Institute (NIST2017) library data.

The results obtained and their discussion. The IR spectrum of the methanol extract of mountain onion is shown in Fig. 1.

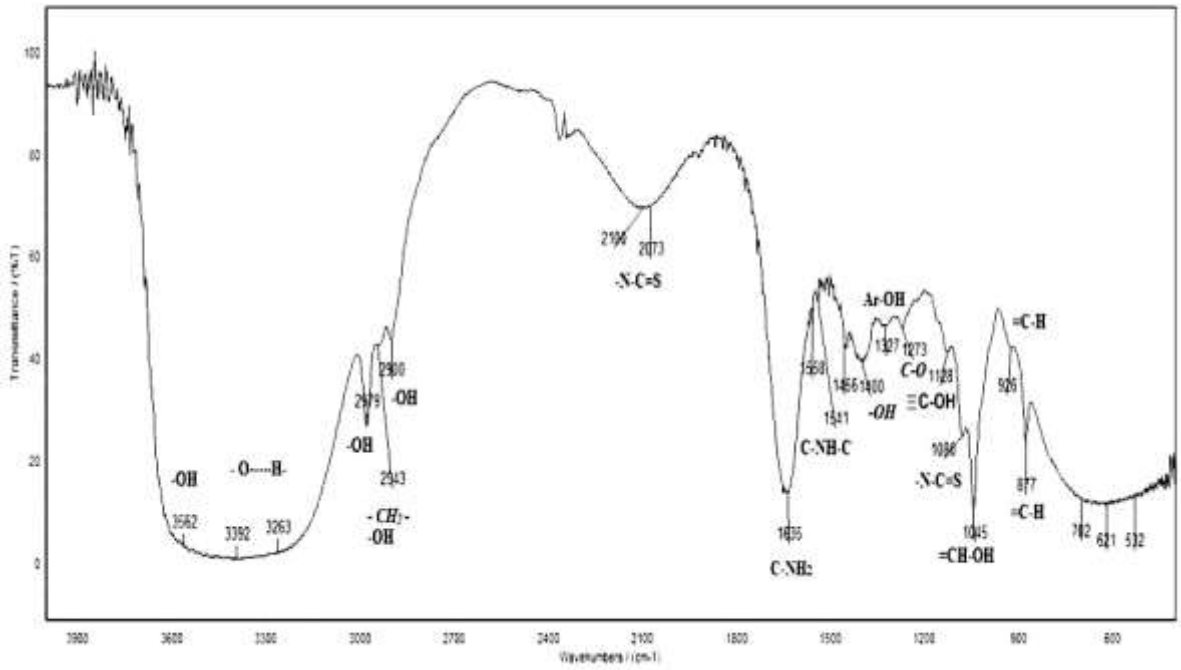


Fig. 1. IR spectrum of methanol extract of mountain onion

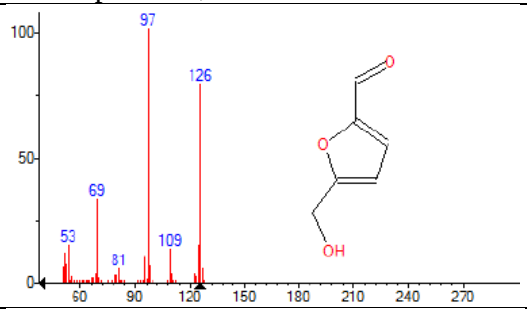
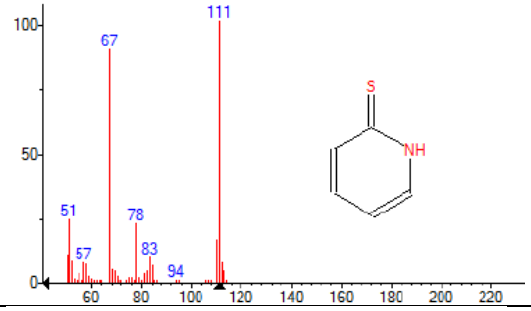
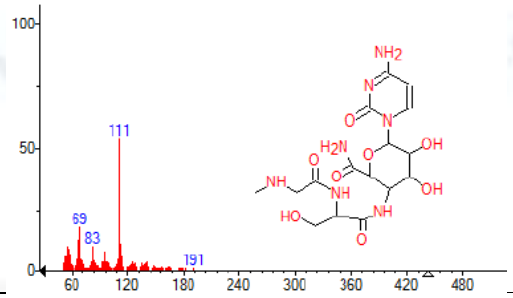
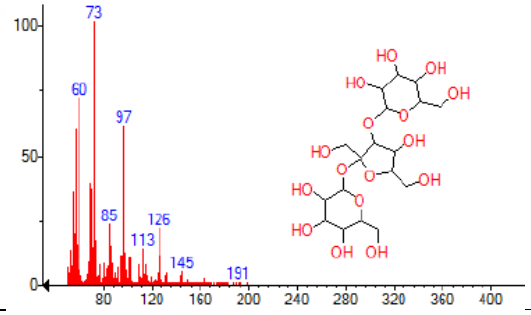
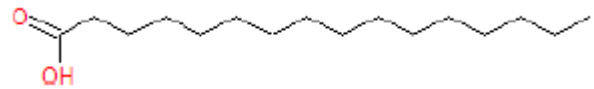
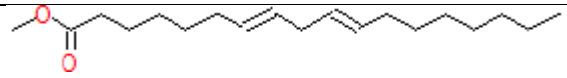
As can be seen from Fig. 1, the absorption band corresponds to the following functional groups and bonds: 3562 cm-1 -O-H bonds, 3392-3263 cm-1 -O …… ..H bonds, i.e. intermolecular hydrogen bond, 2979 cm-1 -OH bonds, 2943 cm-1 -CH2 and -OH bonds, 2900 cm-1 -OH bonds, 2100-2073 cm-1 –NC = S bonds, 1635 cm-1 C-NH2 bonds, 1541 cm-1 C-NH-C bonds, 1400 cm-1 -OH bonds, 1327 cm-1 Ar-OH bonds, 1273 cm-1 CO bonds, 1128 cm-1 ≡C-OH bonds, 1080 cm- 1 –NC = S bonds, 1045 cm-1 = CH-OH bonds, 926 cm-1 = CH bonds and 877 cm-1 = CH bonds.

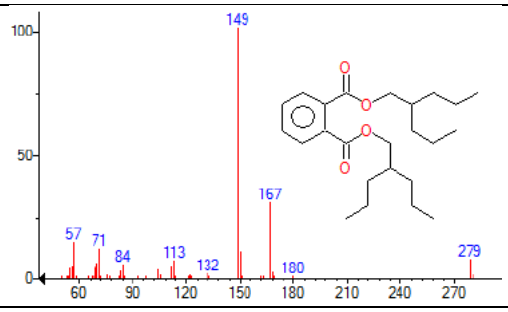
The components separated on the chromatographic column were identified using the spectra libraries: NIST / EPA / NIH 2017 306.622 mass spectrum EI 267.376 compounds, 276.336 with chemical structure, 387.463 chromatographic spectra with retention times, 45.298 MS / MS spectra of precursors. The identification results and their mass spectra are shown in table 1.

As the data of Table 1 shows, as a result of identification, the following components were found from the composition of the alcoholic extract of mountain onions: 5-hydroxymethylfurfural, 2 (1H) - Pyridinthon, glucopyranuronamid, melezitosa n-hexadecanoik kislota, 7.10-octadecadienoik kislota, Phthal kislota and other substances.

Comparison of IR spectrometry and GC-MS analysis shows that the substances that make up the methanol extract contain -OH, -CH2, -NC = S, C-NH2, C-NH-C, Ar-OH, CO, ≡C- OH, –NC = S, = CH-OH, = CH groups and hydrogen bond (-O …… ..H).

Table 1. Composition of methanol extract of mountain onion, analyzed by GC-MS

N	Substance name	Mass spectrum, formula
1	5-hydroxymethylfurfural	
2	2(1H)-Pyridinthone	
3	Glucopyranuronamid	
4	Melezitose	
5	n-hexadecanoic acid	
6	7.10-octadecadienoic acid	

7	Phthalic acid	

The obtained data on the chemical composition of the alcoholic extract of mountain onions indicate the presence of such physiologically active compounds as 5-hydroxymethylfurfural, 2 (1H) -Pyridinthon, glucopyranuronamid, melezitosa n-hexadecanoik kislota, 7.10-octadecadienoik kislota, Phthal kislota and others.

CONCLUSIONS

1. The chemical composition of the alcoholic extract of Allium Oreoprasum was studied by IR spectroscopy and GC-MS.
2. It was revealed that the main components of the alcoholic extract of mountain onions are 5-hydroxymethylfurfural, 2 (1H) -Pyridinthon, glucopyranuronamid, melezitosa n-hexadecanoik kislota, 7.10-octadecadienoik kislota, Phthal kislota and other substances.

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