

Study of qualitative composition of chemical components of leaves and fruits *Laser trilobum* L. by Gas-Chromatography-Mass spectrometry

Sirajeddin V. Serkerov

*Institute of Botany, Azerbaijan National Academy of Sciences,
Badamdar 40, Baku, AZ1004, Azerbaijan*

Gultakin K. Kasumova¹

*Ganja State University, G.Aliyev Ave. 159, Ganja, AZ2001,
Azerbaijan*

Ilhama R. Jahangirova

*Azerbaijan Medical University, Bakikhanov 23, AZ1022, Baku,
Azerbaijan*

Abstract: The chemical components of resins of the leaves and fruits of *Laser trilobum* (Apiaceae) were studied by the method of Gas-chromatography-mass-spectrometry. Totally, 22 components from different groups of natural compounds and oleic acid, phthalic acid, butyl undecyl ester; 1-icosanol; 12-tricosanol; cholesta-4,6-dien-3-ol, (3 β); retinol (vitamin A) etc. have been identified in the extracts of extracted fruits and leaves of the plant.

Key Words: *Laser trilobum*, Apiaceae, sesquiterpene lactones, coumarins, GC-MS, chemical components, identification

INTRODUCTION

The Apiaceae families are united in their genus, the representatives of which contain biologically active substances belonging to different groups of plant substances: the simple coumarins and furocoumarins (*Heracleum* L., *Bilacunaria* Pimen. et. V. Tichomirov, *Angelica* L. [Mikaylova, Serkerov, 2014; Heydarov, Serkerov, 2017], angular pyranocoumarins-3,4-dioxy-3,4-dihydro-seselin (*Seseli* L.) [Mikaylova, Serkerov, 2015], sesquiterpene lactones, sesquiterpenic coumarin derivatives, monoterpene and sesquiterpenic aromatic esters (*Ferula* L.) [Serkerov, 2005; Saidkhodzayev, 1979], et all. Earlier from *Laser trilobum* L. were found in Sesquiterpen lactone-laserolid, izolaserolid, lazolid and trilobolid [Holub, Samek, 1973].

MATERIAL AND METHODS

The object of the study was a collection of extracts from

the leaf and fruits of the *Laser trilobum* L. (Apiaceae) species harvested at the fruiting phase of the forestland at the edge of the road leading to the Altiagac village of the Khizi region. The extraction method was used to extract the extracted material from plant material. For this, dried and finely chopped fruits and leaves (150 g) were extracted 3 times with acetone (3 times each day). The acetone was filtered and distributed in a boiling water bath. This gave 23.6 g. resembling green-brown resin (3.073% on the weight). The Gas-Chromatography-Mass-Spectrometry method was used to study the chemical components of the collected extracted substances.

The component composition of the obtained plant extract was investigated by gas chromatography-mass spectrometry on an Agilent Technologies gas chromatograph 6890N Network CG System, 5975 inert Mass Selective Detector mass spectrometer as a Split / Splitless detector, Injection - Split, Inlet pressure 60,608 kpa, Split / Splitless detector 100 Low Mass - 40, High Mass - 400, Threshold 150.

A 30 meter capillary quartz column "HP-5MS 5% Metil Siloxane" with an internal diameter of 0.25 mm and a slick of a stationary phase of 0.25 μ was used. Analyzes were carried out in temperature programming mode from 50°C to 280°C at a speed of 15°C/min. Column temperature: initial temperature 50°C, 2 minutes is stable; raising the temperature 15°C/min. up to 200°C, 6 min. stable; raising the temperature 15°C/min. up to 280°C, 10 min. stable. Vacuum - HiVac - 3.38 e-005

Diluted with methanol: chloroform (1: 2). Velocity of carrier gas (He) 1 ml/min. Input samples with current division (1:50). To identify the connection the standard mass spectrometric library NIST was used. The analysis time is 33 minutes.

As can be seen from the data in the table, no substances of the sesquiterpene lactone group characteristic of the subsurface organs of *L. trilobum* were found in the studied plant material.

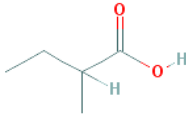
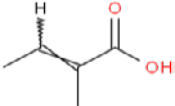
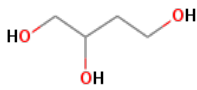
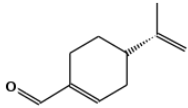

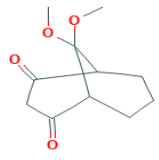
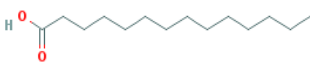
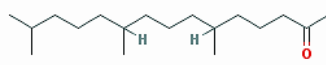
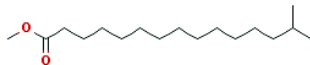
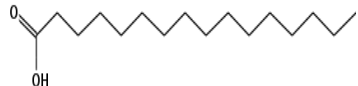
RESULTS AND DISCUSSION

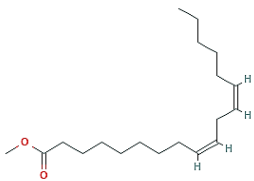
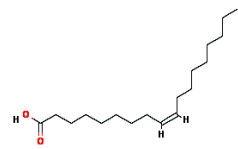
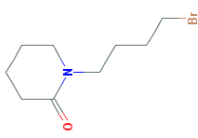
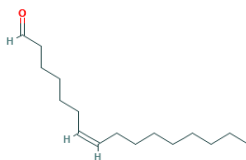
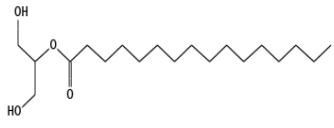
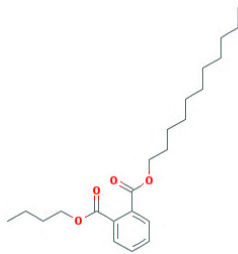
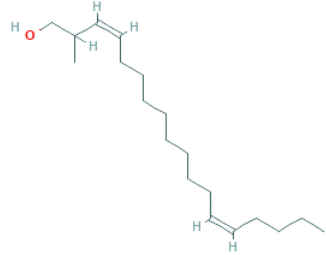
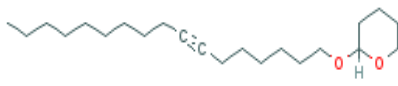
The chemical components of extracts from the leaves and fruits *L. trilobum* are given in Table. The GC-MS analyses allow us to identify 22 components. Identification of individual components of extracts was per-


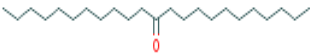
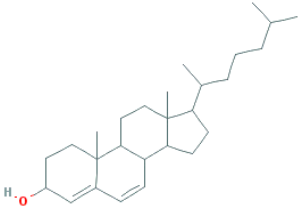
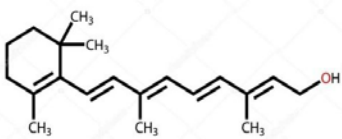
Accepted for publication: 5 December 2018

¹E-mail: qasimova_gultakin@mail.ru

Table. Component composition of extracts of leaves and fruits of *L. trilobum*.

No	Component name	Composition and molecular weight	Component structure
1	2	3	4
1	Butanoic acid, 2-methyl-	$C_5H_{10}O_2$, M=102	
2	2-butenoic acid, 2-methyl-	$C_5H_8O_2$, M=100	
3	1,2,4-butanetriol	$C_4H_{10}O_3$, M=106	
4	1-cyclohexene-1-carboxaldehyde, 4-(1-methylethenyl)-	$C_{10}H_{14}O_3$ M=150	
5	Tetradecane	$C_{14}H_{30}$ M=198	
6	9,9-dimethoxybicyclo [3.3.1] nona-2,4-dione	$C_{11}H_{16}O_4$ M=212	
7	Tetradecanoic acid	$C_{14}H_{28}O_2$, M=228	
8	2-pentadecanone, 6,10,14-trimethyl-	$C_{18}H_{36}O$ M=268	
9	Pentadecanoic acid, 14-methyl-, methyl ester	$C_{17}H_{34}O_2$, M=270	
10	n-hexadecanoic acid	$C_{16}H_{32}O_2$, M=256	

1	2	3	4
11	9, 12-oktadecadienoic acid, methyl ester	$C_{19}H_{34}O_2$, M=294	
12	Oleic acid	$C_{18}H_{34}O_2$, M=282	
13	2-piperidinone, N-[4-bromo-n-butyl]-	$C_9H_{16}BrNO$, M=233	
14	7-hexadecenal, (z)-	$C_{16}H_{30}O$, M=238	
15	hexadecanoic acid, 2-hydroxy-1-(hydroxymethyl) ethyl ester	$C_{19}H_{38}O_4$, M=330	
16	Phthalic acid, butyl undecyl ester	$C_{23}H_{36}H_4$, M=376	
17	2-methyl-Z,Z-3,13-octadecadienol	$C_{19}H_{36}O$, M=280	
18	2H-Pyran, 2-(7-heptadecyloxy)tetrahydro-	$C_{22}H_{40}O_2$, M=336	

1	2	3	4
19	1-Eicosanol	C ₂₀ H ₄₂ O, M=298	
20	12-tricosanone	C ₂₃ H ₄₆ O, M=338	
21	Cholesta-4,6-dien-3-ol, (3β)-	C ₂₇ H ₄₄ O, M=384	
22	Retinol	C ₂₀ H ₃₀ O, M=286	

formed by computerized matching of the acquired mass spectra with those stored in NIST mass spectral library of the GC/MS data system. Obtained results on extracts from explored plant material were not revealed coumarin derivatives or sesquiterpenic lactones specific to the plants belonging to the family Apiaceae.

REFERENCES

- Heydarov I.G., Serkerov S.V. (2017) Coumarins of roots of the *Angelica purpurascens*. *Chem Nat Compd*, 53(1): 149-150.
- Holub M., Samek Z. (1973) On terpenes CCXXVI. The Structure a Sesquiterpenic lactone from *Laser trilobum* (L.) Borkh. *Collect. Czech. Chem. Commun.*, 38: 1428-1433.
- Mikayilova N.Kh., Serkerov S.V. (2014) Noviy komponenti smoli korney *Bilacunaria microcarpa* (Bieb.) M. Pimen ex V. Tichomirov. *Khimiya pas-titelnoqo sirya*, 4: 215-218.
- Mikayilova N.Kh., Serkerov S.V. (2015) New monoesters of 3',4'-dihydroselesin from *Seseli compestre* Bess. root resin. *Chem Nat Compd*, 5: 826-827.
- Saidkhoddjayev A.I. (1979) seskviterpenoviy proi-zvodniye roda *Ferula*. *Khimiya prirodnikh soyedineniy*, 437-466.
- Serkerov S.V. (2005) Terpenoidi fenolproi-zvodniye ras-teniy semeystva Asteraceae i Apiaceae. Baku: *CBS Polygraphic Production*, 312 pp.

Laser trilobum növünün yarpaq və meyvələrinin kimyəvi komponentlərinin keyfiyyət tərkibinin Qaz-Xromato-Mass-spektrometriya metodu ilə öyrənilməsi

Siracəddin V. Sərkərov
AMEA Botanika İnstitutu, Badamdar şossesi 40, Bakı, AZ1004, Azərbaycan

Gültəkin K. Qasımoğlu
Gəncə Dövlət Universiteti, H.Əliyev prospekti 159, Gəncə, AZ2001, Azərbaycan

İlhamə R. Cahangirova
Azərbaycan Tibb Universiteti, Bakıxanov 23, AZ1022, Bakı, Azərbaycan

Laser trilobum L. (Apiaceae) növünün meyvə və yarpaqlarının asetonla ekstraksiya edərək alınmış ekstraktiv maddələr cəminin Qaz-Xromato-Mass-spektrometriya metodu ilə kimyəvi komponentlərinin keyfiyyət tərkibi öyrənilmişdir, 22 komponent, o cümlədən olein turşusu, ftal turşusu, butil undesil efiri, 1-eykozanol, 12-trikoanon, xolestra-4,6-dien-3-ol və retinol (vitamin A) identifikasiya edilmişdir.

Açar sözlər: *Laser trilobum*, Apiaceae, seskviterpen laktonları, kumarinlər QX-MS, kimyəvi komponentlər, identifikasiya

Изучение качественного состава химических компонентов листьев и плодов *Laser trilobum* методом газо-хромато-масс-спектрометрии

С.В. Серкеров

Институт Ботаники НАНА, Бадамдар 40, Баку, AZ1004, Азербайджан

Г.К. Касумова

Гянджинский Государственный Университет, прос. Г. Алиева 159, Гянджа, AZ200, Азербайджан

И.Р. Джахангирова

Азербайджанский Медицинский Университет, Бакиханова 23, AZ1022, Баку, Азербайджан

Изучен качественный состав химических компонентов листьев и плодов *Laser trilobum* L. (Ariaceae). В составе ацетонового экстракта газо-хромато-масс-спектрометрическим методом идентифицированы 22 компонента, относящихся к различным группам натуральных соединений, в том числе олеиновая, фталевая кислоты, бутил-ундециловый эфир, 1-эуказанол, 12-трикозанон, холест-4,6-диен-3-ол и ретинол (витамин А) и др.

Ключевые слова: *Laser trilobum*, Ariaceae, сесквитерпеновые лактоны, кумарины, ГХ-МС, химические компоненты, идентификация