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Study of Lipids from Fruits of Some Plants Growing in Georgia

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B. Kikalishvili*, Ts. Sulakvelidze, M. Malania, M. Getia, D. Turabelidze

*TSMU Iovel Kutateladze Institute of
Pharmacochemistry. Tbilisi, Georgia*

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ABSTRACT

The aim of our researches was to study the lipids and accompanied compounds from the fruits of True Laurel – *Laurus nobilis* L. (*Lauraceae*) and maize – *Zea mays* L. (*Gramineae*) growing in Georgia. Were conducted quantitative and qualitative analyses of fatty acids in neutral lipids obtained from True Laurel fruit using by Gas chromatography. Phospholipids were identified in sum of polar lipids extracted from the fruits of the abovementioned plants.



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INTRODUCTION

Fruits of laurel contains: 25% of fatty acids, anthocyanins, flavonoids, essential oils, cinnamon acid, vitamins and amino acids [1, 2]. Laurel oil is used as an analgesic, anti-inflammatory and anticonvulsant agent and for prevention and treating rheumatism, myositis and Parkinson's disease [3].

Oil from the Maize fruit (*Zea mays* L.) contains various biologically active substances: vitamins A, E, C and B, sterols, fatty acids, saponins, carotenoids and amino acids. It is a cholagogic and diuretic, has a positive action on lipid metabolism and is used to treat and prevent atherosclerosis [4].

The aim of our researches was to study the lipids and accompanied compounds from the fruits of True Laurel – *Laurus nobilis* L. (*Lauraceae*) and maize – *Zea mays* L. (*Gramineae*) growing in Georgia.

MATERIALS AND METHODS

The objects of our investigation are fruits of true Laurel - *Laurus nobilis* L. and maize-*Zea mays* L., growing in Georgia. There were obtained the sum of neutral lipids (N/L) from the air-dried fruits by extraction with hexane. For the separation of the sum neutral lipids there were used silica gel plates LS 5/40 in the systems of solvents: 1. petroleum ether-diethyl ether-acidum aceticum (85:14:1); 2. hexane-diethyl ether (1:1).

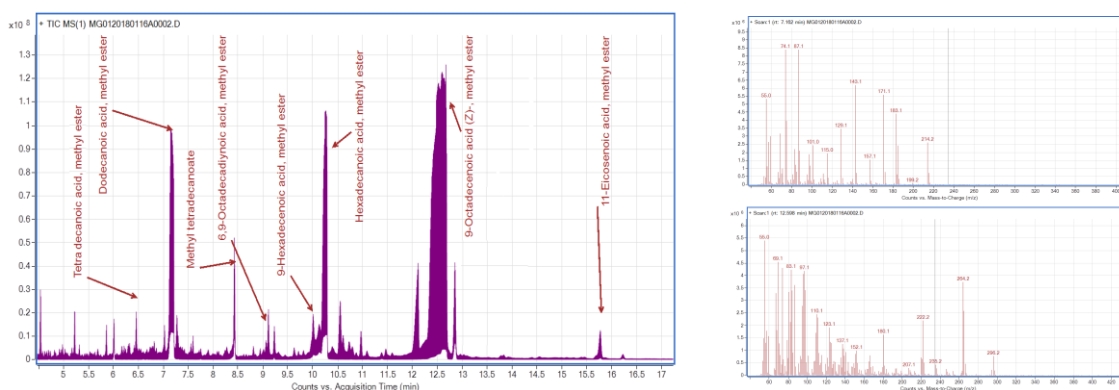
Polar lipids (P/L) were obtained from the residual plants by extracting with the mixture of chloroform-methanol (2:1) and were separated on silica gel plates LS5/40, mobile phase: 1. chloroform-methanol-25% ammonium hydrate; 2. Chloroform-methanol-acetic acid-water (170:25:25:6). The amount of total phospholipids in the P/L was determined by using a spectrophotometric method according inorganic phosphor, wavelength 620nm. For the identification used method of Gas chromatography.

RESULTS AND DISCUSSION

Sum of neutral lipids was obtained by a four-times extraction of an air-dried fruit of True Laurel with hexane with the output of 20%. Were identified compounds of several classes: hydrocarbons, fatty acid ethers, triglycerides, free fatty acids and diglycerides. Its physical-

chemical data are: specific weight d_4^{20} - 0.915; refraction index n_D^{20} - 1,471; acidity number - 4.9 mg. KOH/g; and iodine number - 64.

Using the Gas chromatography (Agilent technologies 7890B, MS 5977A): Column: HP-5ms Ultra Inert 30m x 0.25mm x 0.25 μ m) were realized quantitative and qualitative analyses of fatty acids; were identified following compounds: dodecanoic acid 33,71%, tetradecanoic acid 3,11%, pentadecanoic acid 9,3%, hexadecanoic acid 17,96%, 9-hexadecenoic acid 3,27%, 9-octadecenoic acid 19,9%, 6-9-octadecadienic acid 3,28% and eicosenoic acid 1,99% [5, 6].



HPLC of the sum neutral lipids from the fruits *Laurus nobilis* L.

A sum of polar lipids with the yield of 2,5% was obtained from the residual plant after isolating neutral lipids by extraction with chloroform-methanol mixture 2:1 [7].

After purification the polar sum, the following of phospholipids were identified: phosphatidylinositol, phosphatidylcholine, and phosphatidylethanolamine and N-acyl lysophosphatidylethanolamine. The amount of total phospholipids in the P/L sum is 0,55%. This amount was identified by using a spectrophotometric method by considering inorganic phosphor, wavelength 620 nm.

A sum of neutral lipids was obtained by a four-time extraction of an air-dry fruit of maize with hexane and its principal classes were identified: hydrocarbons, triglycerides, free fatty acids, diglycerides and sterols, as well as some of its physical-chemical properties: specific weight d_4^{20} - 0.918; refraction index n_D^{20} - 1,472; acidity number - 4.12 mg. KOH/g; and iodine number - 121.

A sum of polar lipids with the yield of 1,25% was obtained from residual plant after isolating N/L sum with chloroform-methanol mixture 2:1. The following phospholipids were identified in the purified P/L sum: lysophosphatidylcholine, phosphatidylcholine, phosphatidylethanolamine, N-acyllysophosphatidylethanolamine and N-acyl phosphatidylethanolamine. Amount of total phospholipids is 0,3%.

The content of carotenoids in N/L sum of laurel fruit is 3 mg%. In addition, the following 7 amino acids were identified in the fruit of this plant: lysine, leucine, valine, serine, histidine, arginine and phenylalanine. The content of carotenoids in N/L sum of maize fruit was 5,3mg%. The following amino acids were identified in the fruit of this plant: lysine, glycine, valine, serine and asparagine.

CONCLUSION

Qualitative and quantitative characteristics of fatty acids were determined in N/L sum obtained from True Laurel fruit by using Gas chromatography. Dominant saturated fatty acid in the sum of neutral lipids is dodecanoic acid and 9-octadecenoic acid dominates as an unsaturated fatty acid.

Phospholipid was identified in P/L sum isolated from the fruits of the studied objects.

On the base of the results of our project and references data laurel and maize fruit oils can be used in medicine as curative and preventive agents.

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