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Lipids from Some Plants Growing in Georgia



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**Gorgaslidze N.*, Kikalishvili B., Sulakvelidze TS.,
Malania M., Turabelidze D.**

*TSMU I. Kutateladze Institute of Pharmacochemistry,
0159, Tbilisi, Georgia*

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ABSTRACT

Is developed method of extractions of neutral lipids from the Sweet Almond (*Amygdalus communis* var. *dulci*. Fam. *Rosaceae*) and *Medicago sativa* (Fam. *Leguminosae*) cultivated at the experimental area of Tbilisi State Medical University Iovel Kutateladze Institute of Pharmacochemistry. Neutral lipids concentration in the seeds of Sweet Almond is 32% and neutral lipids concentration in the *Medicago sativa* is 32%. In the seeds of Sweet Almond and *Medicago sativa* were determined following fatty acids: Miristic, Palmitic, Oleic, linolic and linoleic acid. The chromatographic analysis shows existence of hydrocarbons, esters of fatty acids, triglycerides and fatty acids. In the oil of the seeds of *Medicago sativa* is determined 5 phospholipids.

INTRODUCTION

Seeds of Sweet Almond contain different types of biologically active compounds, which are used in medicine for the treatment and prevention of the disease; Seeds have bactericidal, antioxidant and diuretic action, they stimulate the immune and hormonal system.

Aboveground parts of *Medicago sativa* contain biologically active compounds, which are used in medicine as an anti-diabetic, anti-bacterial, hepatoprotective, anticancer and choleric activity [2].

MATERIALS AND METHODS

Plant material: The seeds of Sweet Almond (*Amygdalus communis* var. *dulci*. Fam. *Rosaceae*) and *Medicago sativa* (Fam. *Leguminosae*) were collected at the experimental area of TSMU Iovel Kutateladze Institute of Pharmacochemistry [5].

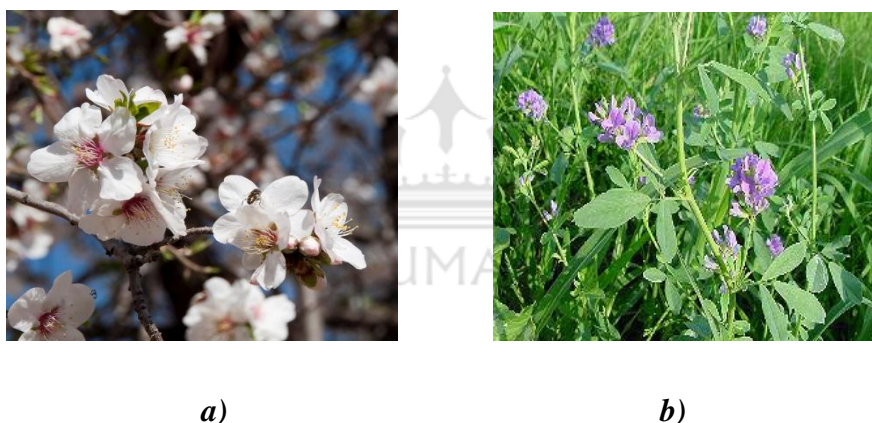


Figure 1. a) *Amigdalus communis* b) *Medicago sativa* [5]

Experimental procedures: Extraction and Isolation. The seeds of Sweet Almond and *Medicago sativa* were extracted with Hexane at room temperature. The pulled extracts were evaporated to dryness under reduced pressure; Neutral lipids respectively: 32% and 15%. The obtained residues were chromatographed on TLC for identification main classes of biological active compounds. For determination of fatty acids in neutral lipids of the seeds was used method of Gas chromatography on apparatus “Chrom-5”, column SE-30, temperature 210⁰C, inlet temperature 250⁰C, detector temperature 240⁰C; Helium – 40ml/min [1, 3, 4].

RESULTS AND DISCUSSION

The aims of our research are to study of lipids from the Sweet Almond (*Amygdalus communis* var. *dulci*, Fam. *Rosaceae*) and *Medicago sativa* (Fam. *Leguminosae*) cultivated at the experimental area of TSMU Iovel Kutateladze Institute of Pharmacochemistry. The chromatographic analysis shows existence of hydrocarbons, esters of fatty acids, triglycerides and fatty acids in neutral lipids from the seeds of Sweet Almond and existence of hydrocarbons, esters of fatty acids, triglycerides, diacylglycerols, sterols and fatty acids in the neutral lipids derived from the seeds of *Medicago sativa*.

The study of physical-chemical characteristics of the seeds oil of sweet almond determined: density – $d^{20} = 0,928$; refractive index $n_D^{20} = 1,471$; Iodine number $I_2 = 93\%$, acid number = $0,76$ mg/KOH, number of saponification = $202,4$ mg/KOH.

Were studied the physical-chemical characteristics of the seeds oil of *Medicago sativa*: density – $d^{20} = 0,912$; refractive index $n_D^{20} = 1,451$; Iodine number $I_2 = 70\%$, acid number = 5 mg/KOH, number of saponification = 140 mg/KOH.

In the neutral lipids from the seeds of Sweet Almond were identified miristic acid – 12%, palmitic acid – 45%, Oleic acid-20%, linolic acid – 2% and linoleic acid – 3% and in the oil from the seeds of *Medicago sativa* were identified Miristic acid – 23%, palmitic acid – 35%, Oleic acid - 12%, linolic acid – 26% and linoleic acid – 5% (Fig. 2).

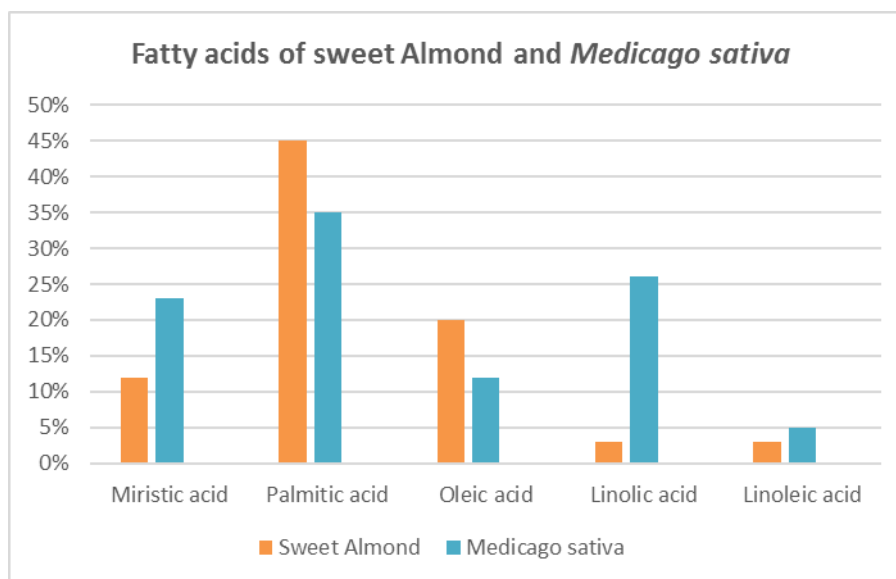


Fig. 2. Concentrations of fatty acids in the neutral lipids from the seeds of sweet almond and *Medicago sativa*

After extraction of the neutral lipids from the seeds of *Medicago sativa* the raw material was re-extracted and was derived polar lipids. In the polar lipids were determined – Phosphatidylcholine 27,6%, lysophosphatidylcholine 25,5%, phosphatidylinositol 24,4%, N-acylphosphatidylethanolamine 9,1%, n-acyllysophosphatidylethanolamine – 9,1%.

CONCLUSION

Is developed method of extractions of neutral lipids from the Sweet Almond (*Amygdalus communis* var. *dulci*. Fam. *Rosaceae*) cultivated at the experimental area of TSMU Iovel Kutateladze Institute of Pharmacochemistry. Neutral lipids concentration in the seeds of Sweet Almond is 32% and neutral lipids concentration in the *Medicago sativa* is 32%. In the seeds of Sweet Almond and *Medicago sativa* were determined following fatty acids: Miristic, Palmitic, Oleic, linolic and linoleic acid. The chromatographic analysis shows existence of hydrocarbons, esters of fatty acids, triglycerides and fatty acids. In the oil of the seeds of *Medicago sativa* is determined 5 phospholipids.

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