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Review Article

An Antioxidant Plant: Melissa Officinalis's Analyzes

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Abstract

Melissa officinalis plant contains 0.8% essential oil. Essential oil components include citronellal, geranial, neral. These compounds make up about 40-75% of essential oils and give the plant a pleasant smell. In this study, we aimed to investigate the phytochemical analysis of lemon balm grown in Konya-Akyokuş region.

Method: Melissa officinalis plant grown in July Organic Farm in Akyokuş region of Konya province was used. The analyzes were carried out in 2017 in the Laboratory of Medical and Aromatic Plants Center of West Mediterranean Agricultural Research Institute.

Results: The total amount of essential oil was 0.22%.Geranial takes the first place with the amount of 26, 19 components. Neral comes second with 17, 61 components and Caryofillene oxide comes third with 12, 63.

Result: Long and dry seasons increase high oil yield but 25% water deficiency should not be exceeded. It is emphasized that the optimal density for melissa should be 40x20cm since the propagation method of the seed of the plant affects the age density productivity.

Key words: melissa officinalis; antioxidant plant; phytochemical analysis,Konya;

Introduction

Melissa officinalis plant contains 0.8% essential oil. Essential oil components include citronellal, geranial, neral. These compounds make up approximately 40-75% of essential oils and give the plant its pleasant scent. Apart from essential oil, it contains 4-5% hydroxycinnamic, which should not be less than 4% compared to European pharmacopoeia. This substance was found to be rosmarinic acid, which is photometrically diagnosed as lamiaceae tannins [1].

Today, it is used in functional gastrointestinal diseases from melissa leaves, and especially nervous gastric diseases and meteorism are among its uses. In addition, spasmolytic is used for colic type pain during gallbladder emptying. Melissa leaves also have a sedative effect [1]. Melissa extract was used in mild and moderate dementia in the 65-82 age group 18 female 24 male; This study in Alzheimer's patients was organized for 16 weeks in a double-blind randomized placebo control. As a result of the study, it has been shown that patients reduce agitation and increase the quality of life [2] A study in breast cancer cell lines revealed the antitumoral effect of melissa [4]. At the German Max Plank institute, melissa officinalis extract has been shown to inhibit cancerous cell proliferation in colon cancer, inducing apoptosis. It was stated in the cell culture study that it induced apoptosis over free oxygen radicals.

Use of

Its daily dose is given as 1.5-4.5 g. Medicinal tea tincture, distillate, liquid extract, phytopharmaceuticals are available [1]. There are no known side effects or contraindications.

With this study, we aimed to investigate the phytochemical analysis of melissa off. Grown in Konya-Akyokuş region.ls. There are also ESKOP and WHO monographs [1].

Material method

Melissa officinalis plant grown in July Organic Farm was used in Akyokuş region of Konya. Analyzes were made in 2017 at the Medical and Aromatic Plants Center Laboratory of the Western Mediterranean Agricultural Research Institute.

Essential Oil Quantification

The amount of essential oil is defined as the amount of substance defined in milliliters per 100 g of anhydrous plant obtained by distillation under the conditions specified in this standard.

The principle of this method is to distill the aqueous suspension of the sample, collect it in a graduated tube containing a certain volume of xylene used to hold the essential oil in the distilled part, read the total volume of the organic phase and calculate the essential oil after removal of the xylene volume [6].

Sample sample preparation

Approximately 20 g of dried plant material prepared for analysis. The sample was weighed. The weighed sample was placed in the glass clevenger flask. Approximately 10 times (200 ml) of pure water was added to the sample. It was subjected to hydrodistilation for approximately 2 hours. Then, the essential oil sample that accumulates in the graduated section and creates a phase difference with water was read and the result was recorded in ml. Then, based on the weighing amount, the amount of essential oil was calculated as a percentage.

Essential Oil Component Determination

Gas Chromatography Mass Spectrometry Analysis

Samples are diluted 1: 100 with hexane for study. Volatile oil compound quantity investigation of samples was done by capillary column (HP InnowaxCapillary; 60.0 m x 0.25 mm x 0.25 µm) with GC / GC-MS (Gas chromatography (Agilent 7890A) -mass detector (Agilent 5975C)). In the study, 0.8 ml / min flow amount was treated with helium as the entraining gas, the samples were injected into the machine with a split amount of 40: 1 in 1 µl. Injector temperature was kept at 250 ° C, column temperature program was arranged as 60 ° C (10 minutes), from 60 ° C to 220 ° C, 4 ° C / minute and 220 ° C (10 minutes). Within the framework of the determined temperature plan, the total working time was 60 minutes. Scanning range (m / z) 35-450 atomic mass unit and electron bombardment ionization 70 eV were used for mass detector, WILEY and OIL ADAMS broadcast outputs were used for the determination of volatile substances. The percentages of the resulting substances were determined with the FID detector, and the substance determination was determined by the MS detector [6].TSE Method).

Findings/results

The total amount of essential oil was found to be 0.22%. Geranial takes the first place with the amount of 26, 19 components. Neral comes second with 17, 61 components and Caryofillene oxide comes third with 12, 63.

No	indis	name	component(%)				
1	1258	Cis-0-cimene	1,11	10	1666	Pulegone	1,31
2	1458	1-octen-3-ol	1,19	11	1684	α-humulene	1,35
3	1484	Menthone	1,05	12	1690	Neral	17,61
4	1494	β-citronellal	10,28	13	1721	germacrene	4,54
5	1476	α-cubebene	0,74	14	1730	Geranial	26,19
6	1560	Linalool 4,34		15	1748	Piperitone	1,24
7	1565	Caryenone	1,24	16	1766	δ-cadinene	0,84
8	1595	Bornyl acetate	0,73	17	2001	Caryofillene oxide	12,63
9	1618	β-caryophyllene	10,98	18	2061	Humulene epoxide	0,75
						unidentified on	1,88

Table.1 *Amount of essential oil component of melissa officinalis.*

Discussion

We aimed to perform phytochemical analysis of Melissa officinalis plant grown in Konya. In our pub med literature research, we found that there was no study on the analysis of Melissa Officinalis grown in the Konya region.

There are many studies in the literature on the chemical composition of melissa officinalis. Melissa officinalis is a strong free radical scavenger in a study on free radical and antimicrobial activity; Monoterpene and aldehyde have shown that ketones, mono and sesquiterpene hydrocarbons are responsible for this scavenging effect. Antimicrobial effect of multi officers of Melissa officinalis Shigella sonet bacteria and antimicrobial effect of Trichophyton species [7].

In a study, 60 drops / day melissa was used for 4 months in moderate Alzheimer's patients aged 65-80 years; It has been shown to be effective on cognitive functions without any side effects compared to the placebo group. Akhondzadeh et al. [2]

It is stated that the internal use of melica tincture, hydrolate can be used in indigestion, spasm, insomnia, neuralgia problems. External use of melica is mostly recommended for migraine and rheumatic diseases [8]. The low doses sedative effect of low dose and peripheral analgesic effect is reported at high doses [9]. The component responsible for the sedative effect is reported to be cariophil [10].

Studies show that melissa also decreases hypercholesterolemia and increases glutathione levels. Lipid-lowering effect has been shown on experimental animals [11].

In the studies conducted, melissa officinalis has 6 basic components, of which 1,3-benzodioxole compound shows 10 times stronger antioxidant properties than ascorbic acid and alpha tocopherol [12].

Melissa officinalis shows moderately sedative, spasmolytic and antibacterial properties that are widely used in traditional medicine. Antitumoral effects of melissa officinalis were demonstrated in cell culture studies conducted in 2010. It is stated that antioxidant activity of Melissa officinalis decreases 1.1 - diphenyl - 2 - picryl - hydrazyl (DPPH) levels [13].

Melissa officinalis is widely used as herbal tea; Contains aromatic and polyphenolic compounds. It contains 0.32% essential oil in dry leaves and .13% is citral (neral + geranial). Total polyphenol compounds make up 11.8%, the total amount of hydroxynamic acid is 11.3% (rosmarinic acid 4.1%) and the total flavonoid compound is 0.5%. It was determined that Melissa tea has a total of 10mg / L essential oil content and 74% of it is citral [23].

Medical plants are natural sources of antioxidants. Melissa belongs to the Lamiaceae family, a large family of medicinal plants. Melissa is a plant belonging to the Mediterranean region in particular is used in some disease in the country folk culture in Turkey and Iran. (Sadraei H et al.2013) Leaves are also used as herbal tea.

Thanks to the polyphenolic compounds it contains, antioxidant [15]. gains antimicrobial properties [16]. Studies show that melissa officinalis leaves can be a pharmacological and nutritional product as a natural antioxidant source [24].

When the factors affecting Melissa's essential oil rates are examined, we see that they can be classified as intrinsic (production) and extrinsic (processing) factors [20]) In general, it is stated that qualitative changes are affected by intrinsic factors and quantitative changes are affected by extrinsic factors [19]. The chemical composition of essential oils affects the amount of light, food, heat, cultural genotype, harvest time, plant age. For example, the amount of tannin of essential oil increases with light intensity. Both the amount of essential oil and its content are affected by the length of the harvested plant. It was determined that the essential oil rate was higher in the top part of the plant [20]. The harvest time of the plant also affects the essential oil content. A study shows that the highest essential oil rate (0.14%) in Çanakkale is obtained at the beginning of the flowering period. [18].

Studies show that the amount and ratio of essential oil is positively affected by lack of water and negatively from salt concentration. [21]. Water deficiency increased essential oil rate from 0.12% to 0.16%. [22]. Long and dry seasons increase high oil yield but 25% water deficiency should not be exceeded. It is emphasized that the optimal density for melissa should be 40x20cm, since the propagation method of the seed of the plant affects the efficiency of its age density [20]

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