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*Aromatic Plants & Cosmetics*  
SYMPOSIUM

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*K. Atatürk*

# I. International Aromatic Plants and Cosmetic Symposium

*October 3<sup>rd</sup>-6<sup>th</sup>, 2019*

*Iğdır University, Türkiye*

## ABSTRACT BOOK



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## PREFACE

### AN OVERVIEW ON COSMETIC SECTOR REGARDING NEW PRODUCT DEVELOPMENT AND BRANDING PROCESSES

**Prof. Dr. Nazan APAYDIN DEMİR (Opening speech).**

<sup>1</sup>Mugla Sıtkı Kocman University, Faculty of Science, Department of Chemistry, Kotekli-Mugla, Turkey

*\*Corresponding author e-mail: demirn@mu.edu.tr*

**Abstract:** The chemistry industry supplies a wide array of processed products including plastics, cosmetics, pharmaceuticals and paints as well as non-processed raw materials to other sectors (textile, electrical, metal, metal products, construction, automotive, paper, service sector). For this reason, the chemical industry has a privileged place in terms of people's daily lives and other sectors. The chemical industry is of the undisputed scientific areas with the respect to preserving ecological balances and quality of human life. Turkey hosts different climate and soil characteristics due to its geographical regions and therefore exhibits rich plant diversity with a total number of 11,000 whereas there are about 12,500 different plant species in Europe. Compared to other European countries, Turkey has a high rate of endemism (34%) with a total number of 3,000 species. Of those plants, some plants have great potentials to be used and to be marketed globally in the fields of medicine and cosmetics. In Turkey, citrus, rose, St. John's wort, Thyme, bay leaves, sweet gum tree and opium are of the common species. European Union countries are of the leading countries in the cosmetics sector and marketing. In this sector, Turkey's share in the global cosmetics market stood at around 1.5% until ten years ago but the recent share is around 0.7%. Of qualified and branded cosmetic products marketed in Turkey constitute only 10% of the Turkey-based products. Turkey's imports of cosmetics and personal care products were approximately \$ 589 million in 2010. For the presentation, the private and state sectors concerning the cosmetics sector, attempts towards the production of cosmetic products and the potential of plant diversity of Turkey were discussed.

**Key Words: Cosmetics, Care Products, Plant Diversity, Turkey**



## INVITED SPEAKERS



*Future perspectives for medicinal and aromatic plant production in Türkiye*

**Prof. Dr. Nazım ŞEKEROĞLU**

Kilis 7 Aralık University Faculty of Engineering and Architecture Department of Food Engineering, Kilis, Türkiye.

*The Future of Naturals in the Cosmetics Industry; Ancient Knowledge, Modern Evidence*

**Rvt. Rana Babaç ÇELEBİ**

Founder of Cerci Yusuf.org & Istanbul Medipol University, History of Medicine & Ethics Phd. Candidate, Aromatherapist, İstanbul, Türkiye



*Assessment of skin-whitening effect of cream prepared using cyanobacteria*

**Asst. Prof. Dr. Ahmad ALI**

Department of Life Sciences, University of Mumbai, Vidyanageri, Santacruz (East), Mumbai, INDIA



*Antiquorum sensing effect of volatile oils in aromatherapeutical formulations: might be a solution for antibiotic resistance?*

**Assoc. Prof. Dr. Ufuk Koca ÇALIŞKAN**

Department of Pharmacognosy and Phytotherapy Programme, Faculty of Pharmacy, Gazi University, Ankara, Türkiye





## Future Perspectives for Medicinal and Aromatic Plant Production in Türkiye.

**Prof. Dr. Nazım SEKEROĞLU**

Department of Horticulture, Faculty of Agriculture, Kilis 7 Aralık University, Turkey

\*Corresponding author e-mail: [nsekeroglu@gmail.com](mailto:nsekeroglu@gmail.com), [sekeroglu@kilis.edu.tr](mailto:sekeroglu@kilis.edu.tr)

**Abstract:** Turkey has a great deal of plant diversity in its flora. The number of used plants for ethnobotanical purposes is around one thousand, eight percent of the total plant richness. Around five hundreds plant species have been mostly used and traded in local and international markets. Currently, eighty percent of these plants have been obtained from nature by wild harvesting. Limited numbers of Medicinal and Aromatic Plants (MAPs) have been cultivated under field conditions. Oil rose, poppy, cumin, black cumin, fennel, anise, red pepper, tea, mint, fenugreek, dill, oregano, sage etc. are of the cultivated MAPs. Although field cultivation have a great portion in the total production, wild harvesting of some oregano and thyme species is going on. Similarly, bay leaf is one of the most exported MAP species; all the traded materials have currently been wild collected. Because of high crop yield with lower investment, standard quality with high secondary metabolite content with desired composition, lower labor costs by modern agricultural techniques, conservation of natural resources, novel crops with high income, and sustainable stocks for market demand, mostly demanded MAPs should be cultivated on the field conditions. In order to support field cultivation; technical information, registered seed or seedlings, postharvest processing equipment and storage support must be given to farmers by local governmental bodies. Additionally, in-situ cultivation of the most demanded MAP species should be started according to Good Agricultural Practices (GAP) after economic analysis for long term benefits and this production should be encouraged by the government for rural development. Besides our local plant species, some MAPs having big global market should be introduced from their origin countries and cultivated in different regions of Turkey.

**Keywords:** Medicinal plants, Aromatic Plants, Cultivation, Wild Harvesting, Quality, Marketing



## **The Future of Naturals in The Cosmetics Industry; Ancient Knowledge, Modern Evidence**

**Prof. Dr. Ayten Altıntaş<sup>1</sup>**

**Rvt. Rana Babac ÇELEBİ<sup>2</sup>**

<sup>1</sup>Medicine Faculty, Department of History of Medicine and Ethics, İstanbul, Türkiye.

<sup>2</sup>Founder of Cerci Yusuf.org & İstanbul Medipol University, History of Medicine & Ethics Phd. Candidate, Aromatherapist, İstanbul, Türkiye

*\*Corresponding author e-mail: [rana.babac@brandcritique.com](mailto:rana.babac@brandcritique.com)*

**Abstract:** For at least the past 25 years - in parallel to the rapidly changing consumer priorities and preferences - the global cosmetics industry has turned to nature to find inspiration and build a positive image. At the dawn of the modern environmental movement, what lies ahead for the cosmetics industry? Could the answer be hidden in the past?

**Key Words:** Cosmetics, Industry, Future of Naturals, Ancient Knowledge





## **Antiquorum Sensing Effect of Volatile Oils in Aromatherapeutical Formulations: Might be A Solution for Antibiotic Resistance?**

Assoc. Prof. Dr. Ufuk KOCA-ÇALIŞKAN

Department of Pharmacognosy and Phytotherapy Programme, Faculty of Pharmacy, Gazi University, Ankara, Türkiye

\*Corresponding author e-mail: [ukocaa@gazi.edu.tr](mailto:ukocaa@gazi.edu.tr)

**Abstract:** Aromatherapy is a complementary treatment that uses essential oils to promote both physical and emotional health. Lately, aromatherapy has gained more recognition in the fields of science and remedy. Quorum sensing (QS) is a molecular mechanism of gene regulation, the cell-to-cell signaling system in which bacteria adapt their performance consistent with cell concentration and the neighboring environment. Multidrug-resistance microbes frequently use this system for developing the antimicrobial resistance; consequently, anti quorum sensing (AQS) effect could be an applicable methodology for the prevention of bacterial contaminations therefore resistance, with the discovery of new anti-QS agents. In this study, it is aimed to give general information about QS, QSI systems, and antibiotic resistance. Moreover, the presentation will be elaborated with the antiquorum sensing activity on *Chromobacterium violaceum* biosensor system of selected volatile oils used in ‘Aromatherapy’. Aromatherapy is a complementary treatment that uses essential oils to promote both physical

**Key Words:** Aromatherapy, *Chromobacterium violaceum* CV026, Quorum Sensing, Volatile Oils



## Assessment of Skin-Whitening Effect of Cream Prepared Using Cyanobacteria

Dr. Ahmad ALI<sup>1</sup>, Dr. Additiya PARAMANYA<sup>2</sup>, Dr. Komal JADHAV<sup>3</sup>

<sup>1</sup>Department of Life Sciences, University of Mumbai, Vidyanagari, Santacruz (East), Mumbai, INDIA

*\*Corresponding author: [ahmadali@mu.ac.in](mailto:ahmadali@mu.ac.in)*

**Abstract:** High sensitivity of facial skin makes it more susceptible to damage. However, being the most noticeable feature of the body, there has been a consistent desire amongst consumers to beautify it. Skin whitening being the most noticeable feature, consumers tend to use several synthetic creams which indirectly leads to skin damage. This study uses cyanobacterial extract to determine its effect on reduction of melanin pigments. Tyrosinase is one of the key enzymes in the melanin-synthesis pathway. The extract could reduce tyrosinase activity more efficiently when compared with Kojic acid, most widely used tyrosinase inhibitor, and orange peel, a traditional herbal ingredient. A cream was synthesized using this extract which showed tyrosinase inhibition. Furthermore, high antioxidant activity of this cream imparts several other features to the cream such as dead skin removal and reduction of toxins on facial surface.

**Key Words:** Cyanobacteria, Melanin, Skin cream, Skin-whitening, Tyrosinase inhibition



# ABSTRACTS



## Determination of Bioactive Composition of Some Aromatic Plants that Grown Naturally in the Batıraman Campus of Batman University

Alevcan KAPLAN<sup>1</sup>, Umut ÇELİKOĞLU<sup>2</sup>

<sup>1</sup>Sason Vocational School, Organic Farming Program, Batman University Batman, Türkiye

<sup>2</sup>Department of Chemistry, Faculty of Science and Letters, Amasya University, Amasya, Türkiye

Corresponding author e-mail: [kaplanalevcan@gmail.com](mailto:kaplanalevcan@gmail.com)

**Abstract:** The use of aromatic and medicinal plants in developing countries has been widely observed. Aromatic and medicinal plants possess odorous substances and the characteristic aroma is due to a variety of complex chemical compounds. In this study, bioactive composition of *Ajuga chamaepitys* (L.) SCHREBER subsp. *laevigata* (BANKS ET SOL.) P. H. DAVIS, *Salvia palaestina* BENTHAM, *Alkanna trichophila* var. *mardinensis* HUB.-MOR. (an endemic species), *Scutellaria orientalis* L. species have been investigated. In this research, the flowers and leaves of the plants were dried in the open air and then extracted with hexane solvent. The components of the oily extract were analyzed by GC-MS (Agilent 7890B GC- 5977MSD). As a result of the analysis, volatile natural organic materials with various molecular structures were identified. Approximately, *Ajuga chamaepitys* subsp. *laevigata* contains 7 [major components; Heptacosane (47.57%), Celidoniol (35.46%), 2-Ethyl-1,3-hexanediol (6.27%)], *Salvia palaestina* 12 [major components; Trichlorfon (79.15%), Naphthalene 1,2,3,4,4a,5,6,8a-octahydro-4a,8-dimethyl-2-(1-methylethyl)-, [2R (5.84%), 3-Aminophenol (1.47%)], *Alkanna trichophila* var. *mardinensis* 9 [major components; Diisooctyl phthalate (60.60%), Tricosane (12.44%), Docosane (8.64%)], *Scutellaria orientalis* 11 [major components; trans-Caryophyllene (28.83%), Nonacosane (16.14%), beta-Cubebene (6.46 %)] piece volatile natural organic matter which have economic value and have been used in cosmetic, paint, pharmacology, agricultural protection and various chemical industries as solvent or main components.

**Key Words:** Aromatic plants, GC-MS analysis, *Ajuga*, *Salvia*, *Alkanna*, *Scutellaria*



## An Investigation on Cheese Additive Uses and Chemical Content of *Pastinaca armena*

Meryem Delal YAMAN, Ali OZKAN

Department of Gastronomy and Culinary Arts, Faculty of Fine Arts, Gaziantep University, Gaziantep, Türkiye

\*Corresponding author e-mail: [aozkan27@gmail.com](mailto:aozkan27@gmail.com)

**Abstract:** Cheese is one of the most common and ancient foods after bread culture. The aim of this study is to determine the optimum contribution ratio of the *Pastinaca armena* with high value as a cheese additive and to provide high added value for the region economy by increasing the amount of labor and consumption. *Pastinaca armena* has been used since the ancient time as a cheese additive by the people living in Bingöl, Muş and some part of Erzurum. In this study, *Pastinaca armena* was harvested and stored in 6-7% of the brine. After staying in the brine for about three months, Pulp (1%), Pulp (2%), Extract (1%), Extract (2%), Whole (2%) and Control were prepared and used as an additive in white cheese. Sensory analyzes were performed on the cheese produced. In the sensory analyzes, the highest values were obtained in Extract (1%) and Extract (2%). Some chemical analyzes of *Pastinaca armena* were performed. Furthermore, mineral contents such as Cu, Zn, Fe, Mg, Ca, K were determined in addition to the content analysis of protein, ash, fructose, glucose, sucrose.

**Key Words:** *Pastinaca armena*, Cheese, Flavor, Aroma, Pilton



## **Preliminary Phytochemical Screening of *Cinnamomum zeylanicum* Commercial Extract**

Bachir raho GHALEM, Hakem OMAR, Seddiki ASMAA

Laboratory of Process Engineering and Chemistry of Solutions, University of Mascara, Algeria

\*Corresponding author e-mail: [bachir\\_raho@yahoo.fr](mailto:bachir_raho@yahoo.fr)

**Abstract:** *Cinnamomum zeylanicum* is an evergreen tropical tree, belonging to the Lauraceae family. It's is widely used as flavor ingredients and also in cosmetics and pharmaceutical preparations. *C. zeylanicum* has many biological properties as analgesic, antiseptic, antispasmodic, aphrodisiac, astringent, carminative, haemostatic, insecticidal and parasiticide. The present study describes the phytochemical profile of *C. zeylanicum* commercial extract. The extracts were subjected to qualitative phytochemical screening using standard procedures. The results showed the presence of steroids, tannins, saponins, cardiac glycosides and phlobatanins. This study provides a scientific initiative towards investigating and identifying the bioactive compounds of this extract.

**Key Words:** *Cinnamomum zeylanicum* commercial extract, Phytochemicals screening.



## Determination of Volatile Components in Wool by Gas Chromatography-Tandem Mass Spectrometry (GC-MS\MS)

Bahattin TABAR<sup>1</sup>, M.Nuri ATALAR<sup>2</sup>, Musa KARADAĞ<sup>3</sup>, Mehmet Hakkı ALMA<sup>4</sup>

<sup>1</sup>Department of Agricultural, Institute of Science, Iğdır University, Iğdır, Türkiye

<sup>2</sup>Department of Biochemistry, Institute of Science, Iğdır University, Iğdır, Türkiye

<sup>3</sup>Department of Technical Sciences, Chemical Processing Iğdır University, Iğdır, Türkiye

<sup>4</sup>Department of Agricultural, Institute of Science, Iğdır University, Iğdır, Türkiye

\*Corresponding author e-mail: [bahattin.tabar@gmail.com](mailto:bahattin.tabar@gmail.com)

**Abstract:** In current work our main objective was to profile the chemical components of volatiles in different color (White, grey and black ) of raw wool using gas chromatography-tandem mass spectrometry (GC-MS\MS) coupled with headspace (HS) technique. The technique is a very valuable in terms of the extraction yield, sample work up time, and profiling analysis. According to the study data, about 100 chemical components were detected from all of wool with head space method. The major components were as follows; the first major component was 2-Methyl-1-pentanol. The rate of 2-methyl-1-pentanol, in the white wool is 44.9 %- rate of in the grey wool 38.8 % - rate of in black wool 17.1%. This component used as expander and solution viscosity reducer. The second major component of wool is D-cycloserine. Rate of D-cycloserine in White wool 19.1%, in the grey wool 32.8% but there is not component in the black wool. D-cycloserine may be effective in various psychiatric diseases. The 3<sup>rd</sup> major component of wool is ethylenimine. Rate of ethylenimine in white wool 11.1 %, in the grey wool 14.9% and in the black wool is 4.43%. but there is not his componenet in the black wool. Poly-ethylenimine is polymer that provides efficient gene transfer. This study exhibits that contrary to popular belief there are many different substances in wool.

**Key Words:** GC-MS/MS, wool, 2-methyl-1-pentanol, D-cycloserine, ethylenimine





## Variation in The Composition of *Schinus Molle* Leaves Essential Oils Derived From Two Bioclimatic Regions in Algeria

Chaoui RADIA<sup>1</sup> Ramazan ERENLER<sup>2</sup> Rouibi ABDELHAK<sup>1</sup> Saidi FAIROUZ<sup>1</sup>

<sup>1</sup>Department of Biology and cellular physiology, Faculty of Nature and Life Sciences, Saad Dahleb Blida 1 University, Algeria

<sup>2</sup>Department of chemistry, Faculty of Arts and Sciences, Gaziosmanpasa Tokat university, Türkiye.

\*Corresponding author e-mail: [radyachaoui@gmail.com](mailto:radyachaoui@gmail.com)

**Abstract:** Since the dawn of time, man has maintained privileged relations with plants especially aromatic plants which are known for their beneficial properties for man's health and well being. Plants with therapeutic potential have been used in many forms among which we find essential oils. The odorant, toxicological and biological properties of an essential oil are related to its chemical composition which can be determined by chromatographic analysis mainly by gas chromatography mass spectrometry. Among the strongly aromatic plants, the false pepper tree (*Schinus molle*, this plant has been used in traditional medicine by the indigenous populations everywhere in the tropics. Its essential oil chemical composition varies according to the region and the organ from which they are extracted. *Schinus molle* essential oils have been classified according to their composition and their major constituent into several chemo type groups. In our study, essential oils were hydro-distilled from air dried *Schinus molle* leaves collected from two different bioclimatic regions in Algeria (Constantine and Biskra), and then analyzed using GC/MS. A total of 11 and 15 compounds were detected and identified respectively. As a consequence, two chemo type groups were identified: the sesquiterpenes chemotype (Constantine) with 20.77% of elemol as a major constituent, and the monoterpenes chemotype (Biskra) which was dominated by the compound 1-phellandrene (19.10%).

**Key Words:** Aromatic plants, essential oils, *Schinus molle* leaves, chemical composition, chemo-type, GC/MS



## Unguentarium as a Ceramic Vessel

Elçin TELLİ

Ceramics, Glass and Tiling Program, Vocational School of Technical Sciences, Iğdır University, Iğdır, Türkiye

*\*Corresponding author e-mail: [elcin.telli@igdir.edu.tr](mailto:elcin.telli@igdir.edu.tr)*

**Abstract:** The Unguentarium is a type of ceramic vessel whose use is thought to date back to the Hellenistic period, although it is not known exactly when it has been originated. 20 century it is known in that French archaeologists first named it Unguentarium. These vessels, which are small in size and made in various models, may have thinness, wide mouths and seal patterns. On the outside, they are likened to a small amphitheatre. There are unguentariums made of ceramic material as well as those made of glass material. When we look at the usage areas, it is understood that various cosmetic products, perfumes, creams made of different plants, massage oils are kept in these containers. According to some sources Unguentariums have also been used as tear bottles. These vessels are thought to have been used in religious rituals due to their presence in cemeteries. Sometimes ceramic and glass Unguentarium can be removed together from the same tomb. A few can be found together in the excavation of the grave, as well as tens of others can be found. Because it is made of terracotta, it is known that very valuable liquids are not transported because they can leak.

**Key Words:** Unguentarium, Ceramic, Ceramic Vessel, Tear Bottle



## Novel Methods for Essential Oil Extraction Producing

Eyyüp KARAOĞUL<sup>1</sup>, M. Hakkı ALMA<sup>2</sup>,

Ertuğrul ALTUNTAŞ<sup>2</sup>, Tufan SALAN<sup>3</sup>, İlhan DENİZ<sup>4</sup>, Mehmet BOZAR<sup>2</sup>

<sup>1</sup> Department of Food Engineering, Harran University, Sanliurfa, Türkiye

<sup>2</sup> Department of Forest Industry Engineering, Kahramanmaraş Sutcu Imam University, K.Maras, Türkiye

<sup>3</sup> Department of Material Engineering, Kahramanmaraş Sutcu Imam University, K.Maras, Türkiye

<sup>4</sup> Department of Forest Endustry Engineering, Faculty of Forestry. Trabzon, Türkiye

\*Corresponding author e-mail: [eyyupkaraogul@gmail.com](mailto:eyyupkaraogul@gmail.com)

**Abstract:** Essential oils are very concentrated extracts from plants which are obtained by steam distillation, hydro distillation or mechanical expression. Essential oils are very volatile oils that each have their unique scent. Some essential oils are oily when touched but most of them are watery. Essential oils are usually lighter than water because of their high monoterpene hydrocarbon contents and are insoluble in water but usually soluble in alcohol, ether, chloroform and fixed oils. Specialized cells in the plant produce, store and secrete essential oils and the synthesis of essential oil components is not universal in all plant cells. The structures are either external secretory structures on the surface of the plant or internal secretory structures that are situated inside the plant. Cells that are involved in the production, storage and secretion of essential oils are glandular trichomes, oil cells, oil ducts, oil canals, resin cells, resin ducts, resin canals, secretory cavities and glandular epidermis of flowers. Various techniques for obtaining essential oils have been developed recently. These techniques are as follows: microwave-assisted distillations (MAD) (with solvents, without solvent, rotatory, solvent-free microwave improved by using carbonyl iron powder, microwave hydro diffusion and gravity), Solvent extraction (SE), supercritical fluid extraction (SFE), ultrasonically assisted extraction in combination with under vacuum distillation, and extraction done by using Naviglio extractor. It was evident that it was possible to get qualified and sufficient yield of essential oil from plants by applying various sophisticated methods alternative to conventional hydro distillation methods. Depending on these techniques, yield, quality and chemical compositions of the essential oils could be probably differed.

**Key Words:** Essential Oil, Methods, Microwave, Solvent, Supercritical Fluid, Ultrasonically



## **Novel Analyses Technique on Some Properties of Vegetable Oil and Deep-Frying Oil by FT-IR**

Eyyüp KARAOĞUL

Department of Food Engineering, Harran University, Şanlıurfa, Türkiye

*\*Corresponding author e-mail: [eyyupkaraogul@gmail.com](mailto:eyyupkaraogul@gmail.com)*

**Abstract:** Deep-frying is an attractive food preparation method and has been in use for centuries. It is a very popular culinary practice worldwide and can be used both industrially and domestically. Fourier transform infrared instrument (FT-IR) is beneficial for interpreting of the interactions between virgin oil (VI) and deep-frying oil (DFO). Moreover, the index calculations from FT-IR spectra is useful and novel for characterization of the oil interactions between VO and DFO. In this study, according to the index calculations, the cis Index (CI), trans index (TI), ester index (EstI), methyl index (MI), carbonyl peroxide index (CPI), unsaturated peroxide index (UPI) and ether index (EtI) were investigated. Results showed that after deep-frying, the CI value decreased while TI value increased than that of the virgin oil. This phenomenon could be explained with the thermal degradation of the oils. Additionally, EstI value was importantly reduced by deep-frying. This was attributed to separation and breaking of the carbonyl ester groups from triglyceride. Also, the increase of MI and EtI values were noted after deep-frying. This could be also clarified with radical polymerizations after the breaking of double bound in the oil. Similarly, the CPI and UPI also raised because of the oxidation of double bound by deep-frying.

**Key Words: Deep-Frying Oil, Virgin Oil, FT-IR, Index Calculation.**



## The Search of Neurotoxic and Immunotoxic Effects of The Chinar (*Platanus Orientalis* L.) Tree Leaf Infusion Against Ethanol Toxicity in Rats

Fatih DÖNMEZ<sup>1</sup> Abdulahad DOĞAN<sup>1</sup> Abdulhamit BATTAL<sup>2</sup>

<sup>1</sup>Department of Biochemistry, Faculty of Pharmacy, Van Yuzuncu Yil University, Van, Türkiye

<sup>1</sup>Department of Biochemistry, Faculty of Pharmacy, Van Yuzuncu Yil University, Van, Türkiye

<sup>2</sup>Department of Pharmaceutical Biotechnology, Faculty of Pharmacy, Van Yuzuncu Yil University, Van, Türkiye

\*Corresponding author e-mail: [eczfatihdnmz@gmail.com](mailto:eczfatihdnmz@gmail.com)

**Abstract:** *Platanus orientalis* L. is a perennial tree species of the Platanaceae family. In Turkish folk medicine, this plant is known as “çınar”. Its main components are proanthocyanidine glycosides, kaempferol, flavonol glycosides, phenolic compounds, carbohydrates, fatty acids and phytol derivatives. The plant has been used against tooth and knee pains in ancient times. The leaves of the plant are used to heal wounds in folk medicine. The roots are used as haemostatic and antivenom in snake bites and also the bark of the plant is used for the treatment of diarrhea. The plant-tree displayed anticancer, antiinflammatory and antinociceptive activities according to previous studies. Furthermore, it was reported to show the activity against hoarseness and asthma. Additionally, the effects of the plant on environmental pollution were investigated. In the present study, the infusion prepared from the leaves of *P. orientalis* has been evaluated firstly in terms of neurotoxicity and immunotoxicity. In this study, the inhibitory activities of acetylcholinesterase (AChE) and butyrylcholinesterase (BChE), which are the indicators of neurotoxicity, were evaluated in the brains of the rats under the oxidative stress. The levels of myeloperoxidase (MPO) and adenosine deaminase (ADA), which are the indicators of immunotoxicity, have been investigated in liver and lung tissues. Thirty male Wistar rats were divided into five groups after toxicity study. The groups are explained as follow: Control, Ethanol 20%, Ethanol 20%+Silymarin (10 mg/kg), Ethanol 20%+ PO-20 mg/mL infusion and Ethanol 20%+ PO-60 mg/mL infusion. The AChE activity in brain tissue was increased in ethanol group compared to the control, whereas the AChE activities in brain tissues were decreased in ethanol 20%+Silymarin (10 mg/kg), Ethanol 20%+ PO-20 mg/mL infusion and Ethanol 20%+ PO-60 mg/mL infusion groups compared to the ethanol 20% group. BChE activities of control and Ethanol 20%+ PO-60 mg/mL infusion groups in brain tissue were significantly decreased compared to the ethanol 20% group. The ADA activities of



Ethanol 20% and Ethanol 20%+ PO-20 mg/mL infusion groups in liver tissues were significantly increased compared to the control, while there was no statistically difference for the ADA activities in lung tissues. The MPO activities of Ethanol 20%+ PO-20 mg/mL and control groups in liver tissues were reduced compared to the ethanol 20%, whereas the MPO activity of Ethanol 20%+ PO-60 mg/mL groups was significantly increased. The MPO activity of Ethanol 20%+ PO-60 mg/mL was decreased compared to the that of ethanol 20%+silymarin while there was no statistically difference for the MPO activities in lung tissues. It was concluded that the infusion prepared from *P. orientalis* leaves suppressed to ethanol-induced neurotoxicity and immunotoxicity.

**Key Words:** *Platanus orientalis* L., Acetylcholinesterase, Butyrylcholinesterase, Adenosine deaminase, Myeloperoxidase, Rat



## Synthesis of Hybrid Nanoflowers with Plant Extracts Traditionally Utilized in Skin Problems and Their Activity Profile

Gökşen Dilşat DURBILMEZ<sup>1</sup>, Emrah BOR<sup>1</sup>,

Ceylan DÖNMEZ<sup>1</sup>, Firdevs GEÇİLİ<sup>2</sup>, Nalan ÖZDEMİR<sup>2</sup>, Ufuk Koca ÇALIŞKAN<sup>1</sup>

<sup>1</sup>Gazi University, Faculty of Pharmacy, Department of Pharmacognosy, Ankara, Türkiye

<sup>2</sup>Erciyes University, Faculty of Science, Department of Chemistry, Kayseri, Türkiye

\*Corresponding author e-mail: [ukoca@gazi.edu.tr](mailto:ukoca@gazi.edu.tr)

**Abstract:** Increasing age, acute and chronic wounds, environmental factors such as sun and wind, destroy the natural structure of the skin. In this study, our aim is to investigate the in vitro enzyme activity of the plant extracts, which are used for preventing skin problems in folk medicine, and their synthesized hybrid nanoflower forms. The selected plant materials *Asplenium ceterach*, *Persea americana* and *Portulacaoleracea* collected from Mediterranean and Central Anatolia Region. Organic-inorganic hybrid nanoflowers were synthesized using the plant methanolic extracts as organic and copper ions (Cu<sup>2+</sup>), zinc ions (Zn<sup>2+</sup>) as inorganic components, respectively. The synthesized organic-inorganic hybrid nanoflowers were characterized by Scanning Electron Microscopy (SEM), and different physicochemical methods. The method of diphenyl picrylhydrazyl (DPPH) was utilized to determine in vitro radical scavenging activity. Total phenolic contents of the extracts and the nanoflowers were determined by using Folin-Ciocalteu Method. The tyrosinase inhibition activities of the plant extracts and their nanoflowers were determined using the modified dopa chrome method with L-DOPA as a substrate. An aliquot of the samples (plant extracts and plant extracts hybrid nanoflowers in the optimum synthesis condition) dissolved in DMSO with 80 µL of phosphate buffer (pH 6.8), 40 µL of tyrosinase, and 40 µL of L-DOPA was added into the each well. Assays were conducted in a 96-well microplate using ELISA microplate reader and absorbance was measured at 475 nm. The results were compared with  $\alpha$ -kojic acid as a reference. Determination was conducted in triplicates and the IC<sub>50</sub> values were obtained from dose-effect curves by linear regression. The percentage inhibition of enzyme activity was calculated. Results will be discussed. Hybrid nanoflowers of the plant extracts used traditionally in skin problems were synthesized for the first time. Although there is a number of plant-derived dermo-cosmetic preparations, hybrid nanoflowers might increase the effect of the individual





plant extract that might affect the result of the whole formulation, and the dosage. These initial studies are promising for the synthesis of hybrid nanoflowers containing plant extracts that might strongly have commercial applications in dermo-cosmetics.

**Key Words: Nanoflower, Medicinal Plants, Tyrosinase Enzyme Inhibition, Skin Disorders, Dermo-Cosmetics**



## Cannabis Use in Skin Disorders and Cosmeceutical Products

Gökşen D. DURBILMEZ<sup>1</sup>, Selda YILDIRIM<sup>1</sup>, Ufuk Koca-ÇALIŞKAN<sup>1</sup>

<sup>1</sup>Gazi University, Faculty of Pharmacy, Department of Pharmacognosy, Ankara, Türkiye

\*Corresponding author e-mail: [ukoca@gazi.edu.tr](mailto:ukoca@gazi.edu.tr)

**Abstract:** *Cannabis* (hemp) is one of the first cultivated plants that have been used for thousands of years, specifically on behalf of its fibers and seeds, for various purposes (building-textile material, paper, nutrients, human and animal health). Studies about hemp have increased especially in the last decade and many effects of hemp (e.g., antidiabetic, neuroprotective, anticarcinogenic, antitrombotic) were determined. Phytocannabinoids such as CBD (cannabidiol), CBC (cannabichromene), CBG (cannabigerol) in hemp and terpenoids, sterols, PUFAs especially found in hemp seed oil have antiinflammatory effects. Studies have shown that cream made of hemp seeds extract, reduces sebum secretion and erythema on human cheek. Hence, hemp is thought to give positive results on inflammatory skin disorders such as atopic dermatitis, acne vulgaris, acne rosacea, uremic pruritus, psoriasis, eczama. Moreover, essential oils in hemp are thought to be used in place of dermacorticoids in the indicated skin conditions. Thanks to its antiinflammatory, antioxidant, moisturizer, sebum regulator and skin barrier booster effects, hemp has been used in cosmeceutical and cosmetic products at the same time. Hemp seed oil is very suitable as an ingredient in body oils, body lotions, lipid-enriched creams, NLC (nano lipid carrier) systems, shampoos, lip balms etc. Additionally, there are a lot of different cosmetic or cosmeceutical products such as antipruritic lotion, cream for acneic skins, moisturizing lotion, sunscreen, soap etc. that includes phytocannabinoids. Hemp has also been increasingly used in antiaging products, which have a significant share in the cosmetic market. In this review, scientific studies on the effects of *Cannabis* sp. in some skin disorders in which inflammatory processes play a role (e.g., atopic dermatitis, eczama, acne vulgaris, uremic pruritus) and in cosmetic-cosmeceutical products containing seed oil, extract etc. of cannabis were reviewed. In this context, effective components that responsible for the activity and possible mechanisms of action were also included.

**Key Words:** *Cannabis* sp., Hemp, PUFAs, Terpenoids, Anti-Inflammatory, Dermacosmetics.



## Phytochemical Constituent of Commercial *Origanum majorana* Extract

Hakem OMAR, Bachir raho GHALEM, Seddiki ASMAA

Laboratory of Process Engineering and Chemistry of Solutions, University of Mascara, Algeria

\*Corresponding author e-mail: [bachir\\_raho@yahoo.fr](mailto:bachir_raho@yahoo.fr)

**Abstract:** *Origanum majorana* L. (common khezama or marjoram) is an aromatic plant of the Lamiaceae (Labiatae) family commonly growing in Mediterranean regions. It is frequently used for culinary and medicinal purpose. The present study aimed to investigate the presence of phytochemicals in *Origanum majorana* extracts. Quantitative estimation of bioactive phytoconstituents showed that the extract contains flavonoids, terpenoids, Saponines, Cardiac glycoside alkaloids, phlobatannins and Cardenolides. The presence of a several phytochemicals in *O. majorana* extracts may serve as a possible source for the development of plant based novel drugs.

**Key Words:** Commercial *Origanum majorana* Extracts, Phytochemical Screening



## Investigation of Effects of Essential Oils of Cumin (*Cuminum cyminum*) and Wild Thyme (*Thymbra spicata*) on SCE (Sister Chromatide Exchange) on Human Lymphocyte Chromosomes

Hanife ARDAHANLI<sup>1</sup>, Süleyman GÜL<sup>2</sup>

<sup>1</sup>Kafkas University, Veterinary Faculty, Department of Biochemistry, Kars, Türkiye

<sup>2</sup>Kafkas University, Faculty of Science and Letters, Department of Molecular Biology and Genetics, Kars, Türkiye

\*Corresponding author e-mail: [ardahanlihanife@gmail.com](mailto:ardahanlihanife@gmail.com)

**Abstract:** The aim of this study was to investigate the effects of *T. spicata* and *C. cyminum* on sister chromatide exchange rate in human peripheral lymphocyte culture in vitro. Human peripheral blood lymphocyte cells were treated with 0.05µl/ml, 0.10µl/ml, 0.15µl/ml and 0.20µl/ml concentrations of *T.spicata* and *C. cyminum* for 24 hours. A significant increase was observed for induction of sister chromatide exchange rate in all treatments of *T. Spicata* and *C. cyminum* concentrations for 24 h comparing with the negative control and mitomycin C (MMC, 0.3µg/ml) which was used as positive control. Also with increasing concentrations of plant extracts of cell replication index is deemed to fall. *C. cyminum* doses and negative of RI coagulation ( $r = -0.95$ ) and *T.spicata* doses and negative of RI coagulation ( $r = -0.94$ ) respectively.

**Key Words:** *T. spicata*, *C. cyminum*, Lymphocyte Culture, Sister Kromatid Exchange, Replication Index.



## New Approaches for Drying Aromatic Plants in Industrial Furnaces

Hasan ÖZÇELİK

Department of Biology, Faculty of Arts & Sciences, Süleyman Demirel University, Isparta, Türkiye

*\*Corresponding author e-mail: [hasanozcelik@sdu.edu.tr](mailto:hasanozcelik@sdu.edu.tr)*

**Abstract:** Aromatic plants in Türkiye are usually collected from natural areas. Very few of them are cultivated. Aromatic plants are generally dried, ground and packaged for domestic needs and presented to the consumer. Conventional drying method; in the shade and air circulation in an area where the raw material is spread by evaporating moisture. Drying in industrial furnaces is a new issue. The customer preference for aromatic plants dried in industrial furnaces is weak. The results of physical, chemical, biological and sensory analyzes such as color, flavor, aroma are not as successful as the traditional method. Mediterranean region is the center of production of aromatic plants. Aromatic plants collected from nature are laid in suitable areas on the mountain and dried during day and night, light, humidity and temperature differences, unexpected rainfall, etc. standards makes drying difficult. The transportation of raw materials to factories at long distances is not considered appropriate in time, labor, economic and biological terms. It is very important in terms of consumer preference to provide drying of aromatic plants in industrial furnaces of similar quality to traditional drying methods. Drying trials were conducted in industrial furnaces under different conditions in 2017 and the results were recorded. The processed products were subjected to sensory and visual testing and presented to the customers. In the drying process, wood-coal (solid fuel) was used for obtaining hot air and no additives such as coloring and flavoring were used. The raw material was sliced to a certain size, then placed in baking trays and dried at about 40-70 degrees for about 3 hours. It can be operated in the collection area, does not spoil the flavor, color and chemical composition of the product; in short, industrial furnaces closest to natural drying are needed. Our scientific and industrial experiments are explained as a solution to this problem. The ways of applying traditional methods in industrial furnaces should be investigated. Our experiments are in this direction.

**Key Words:** Aromatic plants, Drying, Industrial drying oven, Lakes Region



## Production of Filter Tea Bags from Leaf and Fruits of Ayı Üzüümü (*Vaccinium arctostaphylos* L.) and Investigation of Changes in Chemical Compounds

İlhan DENİZ<sup>1</sup>, Eyyüp KARAOĞUL<sup>2</sup>, Burak ULUSOY<sup>3</sup>, Bilge YILMAZ<sup>1</sup>

<sup>1</sup>Department of Forest Industry Engineering, Faculty of Forestry, Trabzon, Türkiye

<sup>2</sup>Science and Technology Application and Research Center, Harran University, Sanliurfa, Türkiye

<sup>3</sup>Graduate of Department of Medicinal Aromatic Plants, The herbalist, Trabzon, Türkiye

\*Corresponding author e-mail: ifdeniz@gmail.com

**Abstract:** Ayı üzümü (*Vaccinium arctostaphylos* L.) are grown naturally in The Eastern Black Sea forest of Türkiye in the highest amount and has the potential to make economic contributions to the local people. Consumption is limited as it deteriorates early in the fresh state. The usage time has been increased and added value has been provided with the production of filter tea bags. The fruit and leaves are dried and ground at 40 °C, 50 °C and 60 °C at 1 m / s drying speed and 20% relative humidity conditions. Dry matter, extract and ash values were determined from the milled samples. 1 gr filter tea bag was produced from ground fruit and leaves (fruit, leaf and fruit + leaf). Tea bags were infused at 50 °C, 80 °C and 100 °C for 1 min. and 3 min and obtained 54 tea solution samples. Antioxidant activity, brix, pH, total phenolic and flavonoid content, condensed tannin and ion analyzes were determined in brewed teas. The obtained values vary according to the drying and brewing temperature and brewing time of the fruits and leaves. Phenolics 85.63mg / kg-239.39mg / kg; flavonoids 484,57mg / kg - 1046,22mg / kg; condensed tannins 21.63mg / kg-52.45mg / kg; antioxidant activity 37.45mg / kg-70.18mg / kg; pH 3.4-6.5; total extract 33,67- 77,36% and ash values were determined as 2,32% - 3,73% .

**Key Words:** *Vaccinium arctostaphylos*, Filter Tea Bag, Antioxidant Activity, Flavonoids



## **A Research on Some Edible and Aromatic Natural Plants in Hizan District (Bitlis)**

İbrahim DEMİR

Bitlis Eren University, Faculty of Arts and Sciences, Department of Biology, Bitlis

*\*Corresponding author e-mail: [hosap65@gmail.com](mailto:hosap65@gmail.com)*

**Abstract:** This study aims to record information about plants used as food by the people of Hizan (Bitlis). This research was conducted between 2018 and 2019. As a result of the study, 59 vascular plant taxa were collected and these plants were identified. As a result, 59 taxa belonging to 22 families used as food were determined. These plants; In traditional dishes, salads are used as spices or drinks. The largest families in terms of the number of taxa in the study area are Asteraceae (9), Apiaceae (8), Lamiaceae (7), Polygonaceae (6), Rosaceae (4), Amaryllidaceae (3) and Boraginaceae (3), respectively.

**Key Words:** Aromatic Plants, Wild foodplants, Ethnobotany, Hizan, Türkiye





## **Antioxidant and Antibacterial Activity of Essential oils of *Artemisia fragrans* Willd. Populations Collected from Northwestern of Iran**

Mehdi YOUNESSI-HAMZEKHANLU

Department of Forestry and Medicinal Plants, Ahar Faculty of Agriculture and Natural Resources, University of Tabriz, Ahar, Iran

\*Corresponding author e-mail: [myounessi@tabrizu.ac.ir](mailto:myounessi@tabrizu.ac.ir)

**Abstract:** *Artemisia fragrans* Willd. is an aromatic and perennial herb with green silver leaves and yellow flowers. In this study antioxidant and antibacterial activity of the essential oil of 16 *A. fragrans* Willd. populations were investigated. Antibacterial activity, minimum inhibitory and bactericidal concentrations of the essential oils were tested and they showed significantly diverse effect against the tested microorganisms, but in general, they showed good inhibitory effect against Gram negative strains in compared with Gram positive ones. Cluster analysis of the populations based on their essential oil antibacterial activity resulted in three separate classes. Multiple linear regression was applied to model the bacteria growth and chemical composition of essential oil relationship. This procedure was helpful in identifying some influential compounds affecting the bacteria growth including, camphor, 4-terpineol, 1,8-cineol, and davanone D. Among the essential oils, the highest free radical scavenging capacity was detected in the E7 (54.68%) and E12 (51.12%) essential oil, respectively. Such high level of polymorphism in chemical composition and antibacterial activity would be useful in selecting interested population for domestic cultivation and pharmacological purposes.

**Key Words:** *A. fragrans* Willd., Essential Oil, Antibacterial Activity, Antioxidant



## Determination of Phenolic Components and mineral elements of *Viscum album* L. extract

Mehmet Nuri ATALAR<sup>1</sup>, Mubin KOYUNCU<sup>2</sup>, Mehmet Hakkı ALMA<sup>3</sup>

<sup>1</sup>Department of Biochemistry, Faculty of Science and Letters, Iğdır University, Iğdır, Türkiye

<sup>2</sup>Department of Food Engineering, Faculty of Engineering, Iğdır University, Iğdır, Türkiye

<sup>3</sup>Iğdır University, Iğdır, Türkiye

\*Corresponding author e-mail: [mnuri.atarlar@igdir.edu.tr](mailto:mnuri.atarlar@igdir.edu.tr)

**Abstract:** *Viscum album* L. is a hemi-parasitic plant that grows commonly on various trees. It has a medicinal plant, is used in traditional medicine as a popular remedy for hypertension, vascular disease, epilepsy, arthritis, and rheumatism and complementary therapy for cancer patients. Phenolic compounds of *Viscum album* L. extract were determined with 1260 Infinity II liquid chromatograph Systems (Agilent, USA) and concentrations of twelve elements were analyzed by using inductively coupled plasma mass spectrometry (ICP-MS) in samples prepared with microwave-assisted digestion. Zn (40,263) and Mn (30.153 ppm) were the most intensive elements found in the plant extract. Besides, o-coumaric acid (122.39 µg/mg), catechin (40.06 µg/mg), p-coumaric acid (32.17 µg/mg), and quercetin (24.13 µg/mg) were characterized as major phenolic compounds by using HPLC.

**Key Words:** *Viscum album* L. Extract, Phenolic Compounds, Mineral Elements.



## Comparison of Variety of Cocoon Samples for Their Phytochemical Content

Mehmet Nuri ATALAR<sup>1</sup>, Mubin KOYUNCU <sup>2</sup>,  
Ufuk Koca ÇALIŞKAN<sup>3</sup>, Şebnem KÜÇÜK<sup>4</sup>, Mehmet Hakkı ALMA<sup>5</sup>

<sup>1</sup> Department of Biochemistry, Faculty of Science and Letters, Iğdır University, Iğdır, Türkiye

<sup>2</sup> Department of Food Engineering, Faculty of Engineering, Iğdır University, Iğdır, Türkiye

<sup>3</sup> Department of Pharmacognosy, Faculty of Pharmacy, Gazi University, Ankara, Türkiye

<sup>4</sup> FEBS Biotechnology

<sup>5</sup> Iğdır University, Iğdır, Türkiye

\*Corresponding author e-mail: [ukoca@gazi.edu.tr](mailto:ukoca@gazi.edu.tr)

**Abstract:** Silk, which originally came from China, had been a great interest of human being in different areas of the industry. The most widely used silk produced by *Bombyx mori*, which has been acclaimed for 5.000 years, has many different and attractive features. When the raw silk fiber is examined, fibroin layer constituting 72-81% of the inner part and sericin layer covering the fiber and forming 19-28% of the outer part are seen. The sericin layer covers the perfect sheen of the fibroin portion of the silk, giving a yellowish color to the fiber and imparting a stiff touch. The fact that silk bolls are readily available in fiber forms is preferred because silk fibroin is preferred and can be obtained in different forms such as gel, powder or membrane, and thus vary in application areas. Its dense or porous structure, controllable solubility and oxygen permeability, the diversity of the application area and the easy accessibility of the material have enabled silk to be used in much different area such as cosmetics, pharmaceuticals and medicine. The purpose of this study was the comparison of different silkworm cocoons for their mineral and phenolic contents. Moreover, fatty acid profile of the cocoons was also determined. According to preliminary results, yellow cocoons demonstrated the highest zinc and higher phenolic content in general. Furthermore, analyzes also presented that yellow cocoon has the highest Vitamin A aldehyde. The results will be discussed in details.

**Key Words:** Silk, Cocoons, Phenolics, *Bombyx mori*

## Effects of Mushrooms Collected in Natural Environment in Medicine and Cosmetics

M. Zeki KOÇAK<sup>1</sup>, Ahmet Metin KUMLAY<sup>2</sup>, M. Hakkı ALMA<sup>3</sup>, Mine KÖKTÜRK<sup>4</sup>

<sup>1</sup> Vocational School of Technical Sciences, Iğdır University, Iğdır, Türkiye.

<sup>2,4</sup> High School of Applied Sciences, Iğdır University, Iğdır, Türkiye.

<sup>3</sup> Iğdır University, Iğdır, Türkiye

\*Corresponding author e-mail: [mzeki.kocak@igdir.edu.tr](mailto:mzeki.kocak@igdir.edu.tr)

**Abstract:** Mushrooms have been collected both in nature and in culture for hundreds of years and it is seen that with technological advances, their use in medicine, industry and food has increased worldwide. Mushrooms have their own smell and taste, high protein content, contain all essential amino acids, wide vitamin and mineral content, low fat content except for macro and micronutrient such as potassium, calcium, phosphorus, magnesium, selenium, iron, zinc and copper, carbohydrate, ash, fiber contains an important place in our nutrition. Fungi also contain glycosides, essential oils, phenolic compounds, tocopherols, carotenoids, flavonoids, folates and organic acids. In many of the studies, the medical properties of mushrooms and their use in the industry, especially in many countries, especially China, Japan and Far East countries; antioxidant, anti-aging, anti-carcinogen, antiviral, antibacterial, anti-HIV, antifungal, antioligenic, have been widely used. Antioxidants, vitamins, especially A, C, E, panthenol and derivatives of these products used in cosmetics are of special interest to researchers. In addition, the number of natural products used in parallel with the increase in the use of effective cosmeceuticals in skin care products has increased. These substances have gained importance in the cosmetic industry by using different types of fungi found in nature (*Ganoderma* sp., *Tuber* sp. etc). In this review, we have determined that the use of mushrooms, which we can easily reach in nature, other than herbal products in medical and industrial applications, is an important resource in these areas. Further research and clinical trials have been observed to confirm that fungi are of molecular origin in medical and industrial applications.

**Key Words:** Fungus, Cosmeceuticals, Chemical Composition, Mineral Nutrients, Primary and Secondary Metabolites



## **Domestic Period in Organic Cosmetics: Anti-Aging Cream with Probiotic Additive from Whey**

Melek ÖZTÜRKLER<sup>1</sup>, Canan GÜLMEZ<sup>2</sup>

<sup>1</sup>Department of Chemistry, Faculty of Science and Letters, Kafkas University, Kars, Türkiye

<sup>2</sup>Department of Pharmacy and Pharmaceutical Services, Tuzluca Vocational High School, Iğdır University, Iğdır, Türkiye

*\*Corresponding author e-mail: [melekozturkler\\_36@hotmail.com](mailto:melekozturkler_36@hotmail.com)*

**Abstract:** Whey (PAS) is an important product of cheese remaining after clotting during cheese making. PAS contains water-soluble vitamins, minerals, proteins, lactose and basic amino acids. In the cosmetic sector, pro-biotics, which have recently come to the forefront, are the pioneers of a new era. Its similarity to hyaluronic acid with anti-aging effect used in the cosmetic industry increases the importance of whey. PAS, which is no longer a waste product due to technological advances and increasing interest from consumers, draws the attention in the cosmetics sector with its probiotic content and natural moisturizing factors as well as its nutritional properties arising from its composition. The aim of the study is to determine the antioxidant and anti-aging activities of the produced cream and to produce different personal care products as prototypes and to provide an important input to the national economy. In the study, whey cream was passed through cream separation and after taking the fat in it, valuable protein part was taken by the developed ultra-filtration technique. The liquid protein was concentrated by evaporator and dehydrated using spray drier. Powdered whey proteins, vitamins and special oils are fortified with pro-biotic added face care cream is produced as a prototype. The prototype is expected to contribute to the development of natural and organic cosmetics.

**Key Words:** Whey, Probiotic, Cream, Cosmetic.



## Determination of Aromatic Components of *Apium graveolens* (Celery) Seeds

Mubin KOYUNCU<sup>1</sup>, Mehmet Nuri ATALAR<sup>2</sup>, Mehmet Hakkı ALMA<sup>3</sup>

<sup>1</sup>Department of FoodEngineering, Faculty of Engineering, Iğdır University, Iğdır, Türkiye

<sup>2</sup>Department of Biochemistry, Faculty of ScienceandLetters, Iğdır University, Iğdır, Türkiye

<sup>3</sup>Iğdır University, Iğdır, Türkiye

\*Corresponding author e-mail: [mubin.koyuncu@igdir.edu.tr](mailto:mubin.koyuncu@igdir.edu.tr)

**Abstract:** Seeds of the *Apium graveolens* plant, celery, are widely used among the public. It is considered to have diuretic, anti-rheumatic and sedative effects and help to lower cholesterol. It is also recommended for the treatment of gout. However, laboratory studies related to these subjects are needed. Aromatic compounds of celery seeds extracted were determined in our study. Aromatic compound analysis was performed using HS-SPME-GCMS method. Among the aromatic compounds obtained from celery seed, the compound with the highest ratio was Colchicine.

**Key Words:** Seed Extract, Aromatic Compounds, HS-SPME-GCMS, Colchicine



## Determination of Aromatic Components of *Plantago major*

Mubin KOYUNCU<sup>1</sup>, Mehmet Nuri ATALAR<sup>2</sup>, Mehmet Hakkı ALMA<sup>3</sup>

<sup>1</sup>Department of Food Engineering, Faculty of Engineering, Iğdır University, Iğdır, Türkiye

<sup>2</sup>Department of Biochemistry, Faculty of Science and Letters, Iğdır University, Iğdır, Türkiye

<sup>3</sup>Iğdır University, Iğdır, Türkiye

\*Corresponding author e-mail: [mubin.koyuncu@igdir.edu.tr](mailto:mubin.koyuncu@igdir.edu.tr)

**Abstract:** *Plantago major*, broad leaf plantain, widely used among the public. It is known to have antioxidant, antibacterial and anti-inflammatory effects. It is also used as raw material in cosmetics and ice cream industry as well as in pharmaceutical industry. Aromatic compounds of *Plantago major* plant extract were determined in our study. Aromatic compound analysis was performed using HS-SPME-GCMS method. The most notable of the aromatic compounds obtained from *Plantago major* was Profenol which is used as anesthetic drug.

**Key Words:** Plant Extract, Aromatic Compounds, HS-SPME-GCMS, Profenol



## Investigation of the Phenolic Contents of *Salvia syriaca* L.

Murat KURŞAT<sup>1\*</sup>, İrfan EMRE<sup>2</sup>,

Muammer BAHŞİ<sup>2</sup>, Mustafa Yunus EMRE<sup>3</sup>, Ökkeş YILMAZ<sup>4</sup>,

<sup>1</sup> Department of Biology, Faculty of Science and Arts, Bitlis Eren University, Bitlis.

<sup>2</sup> Department of Basic Education, Faculty of Education, Fırat University, Elazığ.

<sup>3</sup> Vocational High School, Mardin Artuklu University, Mardin.

<sup>4</sup> Department of Biology, Faculty of Science Fırat University, Elazığ.

\*Corresponding author e-mail: [botanikkursat@hotmail.com](mailto:botanikkursat@hotmail.com)

**Abstract:** *Salvia syriaca* L. one of the largest genera of the Lamiaceae family, has about 900 species and is represented by 99 species in our country. The plant, which is a pharmaceutical raw material, is also available in various types of fragrant and essential oils used in industry. It is widely used in the treatment of colds, sore throat and stomach pain among the people in our country. Many studies have been reported on the antioxidant properties of the plant. The aim of this study was to determine the flavonoid content of *Salvia syriaca* L. plant collected from natural habitats in Baskil district of Elazığ province. In the study, when the flavonoid contents of *Salvia syriaca* L. taxon were examined, the highest amount of rutin (1632.8 µg/g) was found, while catesin (374.8 µg/g) and kaempferol (249.6 µg/g) were detected in other high amounts of flavonoids. In addition to these flavonoids, small amounts of quercetin, naringin, naringenin, myricetin and morin were found.

**Key Words:** Lamiaceae, Medicinal Plants, Phenolics, *Salvia syriaca* L.





## Determination of Phenolic Contents of *Echinophora tenuifolia* L. subsp. *sibthorpiana* (Guss) Tutin Subspecies

Murat KURŞAT<sup>1\*</sup>, İrfan EMRE<sup>2</sup>,  
Muammer BAHŞİ<sup>2</sup>, Mustafa Yunus EMRE<sup>3</sup>, Ökkeş YILMAZ<sup>4</sup>

<sup>1</sup> Department of Biology, Faculty of Science and Arts, Bitlis Eren University, Bitlis

<sup>2</sup> Department of Basic Education, Faculty of Education, Fırat University, Elazığ

<sup>3</sup> Vocational High School, Mardin Artuklu University, Mardin

<sup>4</sup> Department of Biology, Faculty of Science Fırat University, Elazığ

\*Corresponding author e-mail: [botanikkursat@hotmail.com](mailto:botanikkursat@hotmail.com)

**Abstract:** *Echinophora* (Apiaceae) genus, including five species and one subspecies, consists of six taxa in Türkiye. Three of these taxa are endemic. *Echinophora tenuifolia* L. subsp. *sibthorpiana* (Guss) Tutin plant is two or perennial, 20-50 cm in height, thornless, soft hairy, yellow flowers and flavored plant. The plant blooms between June and September. It is an edible plant and has been used for therapeutic purposes since very old years. The plants of the genus *Echinophora* are used for healing wounds among the people, to treat stomach ulcers due to their antifungal, carminative and digestive properties. Studies have shown that the genus *Echinophora* contains strong antioxidant activity with phenolic content. In the study, chromatographic analysis of flavonoid content of *Echinophora tenuifolia* L. subsp. *sibthorpiana* (Guss) Tutin subspecies, was conducted using the method developed by Zuet *al.* (2006). Naringin (103,4 µg/g), quercetin (36,8 µg/g), resveratrol (19,0 µg/g) ve myricetin (6,6 µg/g) contents were determined in *Echinophora tenuifolia* L. subsp. *sibthorpiana* (Guss) Tutin subspecies.

**Key Words:** Apiaceae, *Echinophora tenuifolia* L. subsp. *sibthorpiana* (Guss) Tutin, Phenolics, Phytochemistry.



## Determination of Heavy Metals in Some Cosmetic Products

Murat ÜNALMIŞ<sup>1</sup>, Durali MENDİL<sup>2</sup>

<sup>1</sup>Department of Cosmetics, Vocational School of Technical Sciences, İğdir University, İğdir, Türkiye

<sup>2</sup>Department of Chemistry, Faculty of Arts and Sciences, Gaziosmanpaşa University, Tokat, Türkiye

\*Corresponding author e-mail: [murat.unalmis@igdir.edu.tr](mailto:murat.unalmis@igdir.edu.tr)

**Abstract:** Since the very beginning of history, the beauty sensation among people has always existed and remained on the agenda and maintained its importance. For this reason, personal care and care products have increased their importance. Care products that contain many ingredients may affect human health negatively. These products, which are used very frequently and are not considered important, may have a rich content in terms of heavy metals. Therefore, the present study was designed to investigate the heavy metals including lead, copper, aluminium, manganese, chrome and nickel in some cosmetic products (mascara, lipstick, foundation cream, nail polish, face powder, eyeshadow and eyeliner) belonging X, Y, Z and T re-named brands. In this context, heavy metal contents were determined using atomic absorption spectroscopy (AAS). Of the ascertained heavy metals, aluminium content was more pronounced in most of the products, then followed by manganese and nickel. Herewith, the results were discriminated, clarified and visualized using principal component analysis and heatmap. Specifically, the highest heavy metal values were found for eyeliner, mascara, foundation, lipstick, eye pencil, powder and nail polish.

**Key Words:** Heavy Metal, Cosmetics, Atomic Absorption Spectroscopy, Care Products



## Identification of phenolic components from the rhizomes of sweet flag (*Acorus calamus* L.) using high pressure liquid chromatography (HPLC)

Mehmet Nuri ATALAR<sup>1</sup>, Musa KARADAĞ<sup>2</sup>, Mubin KOYUNCU<sup>3</sup>, Mehmet Hakkı ALMA<sup>4</sup>

<sup>1</sup>Department of Biochemistry, Faculty of Science and Letters, Iğdır University, Iğdır, Türkiye

<sup>2</sup>Vocational school of technical sciences, Iğdır University, Iğdır, Türkiye

<sup>3</sup>Department of Food Engineering, Faculty of Engineering, Iğdır University, Iğdır, Türkiye

<sup>4</sup>Iğdır University, Iğdır, Türkiye

\*Corresponding author e-mail: [musa.karadag@igdir.edu.tr](mailto:musa.karadag@igdir.edu.tr)

**Abstract:** Phenolics are of the significant sub groups of secondary metabolites available in plant kingdom. Various biological, pharmaceutical and medicinal roles have been attributed to the phenolics. Since the biological efficacy of the plants are coupled with their chemical compounds, thence, the chemical profile of the plants collected at different developmental stages or from different locations have been great interest of the researchers. Herewith, in the present study, the phenolic components of rhizomes of sweet flag (*Acorus calamus* L.) were screened using high pressure liquid chromatography method. The rhizomes of *A. calamus* L. are widely used as medicinal plant among public. Of the identified and quantified phenolic compounds, gallic acid (7.60 µg/mg), p- coumaric acid (1.81 µg/mg), o- coumaric acid (0.08 µg/mg), trans-ferulic acid (0.07 µg/mg) and ,quercetin (0.70 µg/mg) were reported herein.

**Key Words:** *Acorus calamus*, HPLC, Phenolic Compounds, Rhizome, Sweet Flag



## Determination of Phenolic Components of *Apium graveolens* (Celery) Seeds

Mehmet Nuri ATALAR<sup>1</sup>, Musa KARADAĞ<sup>2</sup>, Mubin KOYUNCU<sup>3</sup>, Mehmet Hakkı ALMA<sup>4</sup>

<sup>1</sup>Department of Biochemistry, Faculty of Science and Letters, Iğdır University, Iğdır, Türkiye

<sup>2</sup>Vocational school of technical sciences, Iğdır University, Iğdır, Türkiye

<sup>3</sup>Department of Food Engineering, Faculty of Engineering, Iğdır University, Iğdır, Türkiye

<sup>4</sup>Iğdır University, Iğdır, Türkiye

\*Corresponding author e-mail: [musa.karadag@igdir.edu.tr](mailto:musa.karadag@igdir.edu.tr)

**Abstract:** Seeds of the *Apium graveolens* plant, celery, are widely used among the public. The Celery contains many important chemical compounds including Phenols and Flavonoid two compounds have the ability to collect free radicals and minimize the impact of toxic substances resulting from pollution and digestion and metabolism in the body. Phenolic compounds of celery seeds extracted were determined in our study. Phenolic compound analysis was performed using HPLC method. Among the phenolic compounds were identified herein, gallic acid (13.31 µg/mg), caffeic acid (1.59 µg/mg), trans-ferulic acid (0.29 µg/mg) and o-coumaric acid (0.48 µg/mg) were quantified in seeds of the *Apium graveolens*. Phenolic acids such as trans-ferulic acid, caffeic acid and o-coumaric acid have the potential protective roles against oxidative damage diseases such as coronary heart disease and atherosclerosis.

**Key Words:** Seeds of the *Apium graveolens*, Phenolic Compounds, HPLC.

## New Technological Approaches to Drying Aromatic Plants In Industrial Furnaces

Hasan Özçelik<sup>1</sup> Muhammed Mustafa Özçelik<sup>2</sup> Mehmet Poyraz<sup>3</sup>

<sup>1</sup>Süleyman Demirel Univ., Science and Literature Fac., Dept. of Biology, Isparta, Türkiye.

<sup>2</sup>Süleyman Demirel Univ., Graduate School of Natural and Applied Sciences, Dept. of Food and Tecnology, Isparta, Türkiye.

<sup>3</sup>Eksis Makine Company, New Industrial Site, 3231 Street, No: 29, Isparta, Türkiye.

\*Corresponding author e-mail: [hasanozcelik@sdu.edu.tr](mailto:hasanozcelik@sdu.edu.tr)

**Abstract:** Aromatic plants are usually harvested from natural fields in Türkiye. Some of them is cultured. Most of the aromatic plants are dried, ground and packaged for domestic needs and presented to the consumer. Conventional method in drying; evaporation of moisture by laying them in an area where the air is circulated. In practice; drying in industrial ovens is not common. In addition, aromatic plants dried in industrial ovens have a weaker customer preference. The results of physical, chemical, biological and sensory analyzes such as color, flavor, aroma are not as successful as traditional methods. The Mediterranean region and especially the Lake Region within this region are the production centers of aromatic plants. Aromatic plants collected from the nature are scattered in the mountains and are exposed to light, humidity and temperature differences during the day and night, unexpected precipitation, etc. it makes it difficult to dry according to the standards and even drying and hygiene control is not achieved. It is aimed to provide drying of aromatic plants in industrial furnaces with better quality, hygienic, controlled and evenly dried than conventional methods. In some plants with high economic value, it is aimed to obtain the aromatic water and the volatile oil contained in the plant by passing it through the cooling system under vacuum while the water contained in the plants (rose, lavender etc.) is evaporated. Drying experiments were carried out in industrial furnaces under different conditions in 2017 and their results were recorded. The results are presented to the customers who have been subjected to sensory and visual tests. In the drying process, wood-coal (solid fuel) was used for hot air, and additives such as coloring and flavoring were not used. The raw material was sliced to a certain size, then placed in oven trays and dried at a temperature of 40-70 degrees for about 3 hours. Drying time, the size of the dried food and the temperature of the oven are found in the related charts. The Mediterranean region and especially the Lake Regions within the region are the production centers of aromatic plants. Aromatic plants collected from the nature are scattered in the fields seen in the mountains and are exposed to light, humidity and temperature differences during the day and night, unexpected precipitation, etc. it makes it difficult to dry according to the standards. In this case, the taste of the product, the color, the chemical composition does not disturb; In short, there is a need for industrial furnaces that are closest to natural drying or capable of drying in better quality, controlled conditions. Our scientific and industrial purposes are described in this report as a probing solution. Drying of aromatic plants made with traditional methods in industrial ovens can be carried out under controlled and hygienic conditions. In the developed vacuum drying system, it has been tried to dry the plants which have high economic value in a short time at low temperatures under vacuum, to obtain aromatic waters and volatile oils, and positive results have been obtained.

**Keywords:** Aromatic plants, Drying, Industrial drying oven, Lakes region



## **Ethnobotanical survey of medicinal plants used in Bouira region (Algeria)**

Sahar OUAHIBA, Meddour RACHID, Abdoune NESRINE, Dermou CHEMALIKA

Faculty of Biological Sciences and Agronomic Sciences, Mouloud Mammeri University, Tizi Ouzou, Algeria

Corresponding author e-mail: [o.sahar@yahoo.fr](mailto:o.sahar@yahoo.fr)

**Abstract:** This study consists in inventorying the medicinal plants used by the rural population of the Bouira region, in order to collect the therapeutic uses of the plants. The survey was conducted in the spring of 2018 with 69 informants, in two municipalities (El Asnam and Haizer) at the Bouira region *by using 1369 questionnaires*. The results show that informants are mainly over 60 years old and 57% of them have no level of education. We identified 136 medicinal species belonging into 52 families *with a prevalence of Asteraceae (17) and Lamiaceae (14)*. Leaves are the parts of the plants mostly used. The recipes are prepared mainly by infusion and decoction, and administered orally. The outcomes of the survey allowed us to record 67 diseases treated by this medicinal plant, and the most treated are the digestive (27%) and dermal system (15 %).

**Key Words:** Medicinal Plants, Rural Population, Ethnobotany, Bouira , Algeria.



## Medicinal and Aromatic Plants Used in Bath Culture in Gaziantep

Serap ŞAHİN YİĞİT<sup>1</sup>, Fatih YAYLA<sup>1</sup>,

Didem KOÇUM<sup>2</sup>, Belkıs MUCA YİĞİT<sup>3</sup>, Muhittin DOĞAN<sup>1</sup>

<sup>1</sup> Department of Biology, Faculty of Arts and Sciences, Gaziantep University, 27310, Gaziantep, Turkey

<sup>2</sup>Department of Molecular Biology and Genetics, Faculty of Science and Literature, Kilis 7 Aralık University, 79000 Kilis, Turkey

<sup>3</sup>Vocational School of Technical Sciences, Iğdir University

*Corresponding author:* [serap.syigit@gmail.com](mailto:serap.syigit@gmail.com)

**Abstract:** Throughout the history, water has been one of the main determinants of the human lifestyle in every culture. It is known that there is a water culture (bath tradition) in Anatolia since ancient times. But it is the Turkish bath tradition that adds both actuality and immortality to this culture. Turkish baths, which are among the most important extant water structures, are the products of a building type that appeared with the merger of Turkish bathing culture with the Anatolian bathing culture. The Turkish Hammam is not only an historical and tourist spot, but also an important phenomenon of social life in Turkey. People have used the traditional Turkish bath for centuries to clean themselves, to maintain their health and to treat a variety of ailments. People desires to use the baths not only for cleaning themselves, but also for beauty and to “stay young”. Although the Hammam has a long history and widespread distribution all over the world, and widespread using purposes, to our knowledge, the plants were used in Turkish Hammam were not studied. Therefore, in this study, it is tried to determine the plants used in the hammams of Gaziantep province which has a very rich hammam culture. For this purpose, Gaziantep Hammam Museum, herbalists and Gaziantep baths were visited and interviews were conducted. It was determined that the plants were used in hammams especially by women. It was found that women mostly use the plants in the hammams for hair care and smell. As a result of the interviews, it was determined that women prepared the water they had washed by waiting lavender seeds or stinging nettle in hot water to prevent hair loss. In addition, it was found that they use linden, chamomile or nettle with water to give shine to the hair were determined. In order to smell good, it was found that the women prepared their last rinsing water by soak the rose, lavender or cinnamon in hot water. It is clear that women use plants not



only for themselves but also for their children. The newborn babies bathe, used the water prepared with cinnamon to smell good. "Şamşırak" poured from the head of the bride in the hammams, arranged specially for the brides is another application in which the plants are used in the hammams is the custom. It is believed that "Şamşırak" will make her valuable and convivial for her husband. "Şamşırak" contains cinnamon, sugar, pink sugar color and prepared by mixing the scents of musk, amber and rose spreading of a little amount of "Harmal (Üzerlik)" seed to the mixture.

**Keywords: Hammam, Aromatic Plants, Bath Culture, Gaziantep**





## Medicinal and aromatic plants that used for cosmetic purposes sold in herbalists in Gaziantep

Serap ŞAHİN YİĞİT<sup>1</sup>, Hasan AKGÜL<sup>2</sup>, Muhitin DOĞAN<sup>1</sup>

<sup>1</sup> Department of Biology, Faculty of Arts and Sciences, Gaziantep University, Gaziantep, Turkey

<sup>2</sup> Department of Biology, Faculty of Arts and Sciences, Akdeniz University, Antalya, Turkey

Corresponding author: [serap.syigit@gmail.com](mailto:serap.syigit@gmail.com)

**Abstract:** Since the beginning of history, people have tended to change their appearance to increase their self-confidence, their success in social life and their chances of continuing their generations. From the earliest times to the present day, human beings, who seek remedy for all their needs, including healing and feeding and sheltering needs, applied to nature first to change their appearance. To care for their skin and physical appearance, different civilizations have used, and still use, a variety of different mineral, animal, plant, and chemical products. Anatolia, which has been home to humanity since the chipped stone age (Paleolithic), has been home to many civilizations for centuries as well as having a rich flora due to different climatic and geographic conditions. In this context, considering its historical background, Anatolian people have a very wide cultural heritage in terms of benefiting from nature thanks to both culture and plant diversity. In this study, it has been aimed to determine the plants that are used in cosmetic purposes in Gaziantep which are sold in herbalists. Because Gaziantep has been an important center in every period since the day when people started to settled life, and its loyalty to traditions and customs, and having effective plant human relations. This study was carried out with the assistance of 30 traditional medicinal plant holders in the city center using a questionnaire. Information regarding Latin name, public name, part(s) used, preparations of plants and purpose of usage were collected with these questionnaires. As a result of our research, it was determined that 28 taxa were sold for cosmetic use in Gaziantep herbalists. The highest number of taxa were used for beautifying the hair. It was determined that plants were purchased to give vitality and shine to hair, to be used to prevent shedding, or to change hair color.

**Keywords:** Gaziantep, Herbalist, Medicinal plants, Cosmetics



## Herbalists and Marketing of Medicinal and Aromatic Plants in Algeria: A Case Study in the Cities of Bouira and Tizi Ouzou

Rachid MEDDOUR<sup>1</sup>, Ouahiba SAHAR<sup>1</sup>, Djouher Ould MAHAMMED<sup>1</sup>, Anissa Si BACHIR<sup>1</sup>

<sup>1</sup>Faculty of Biological Sciences and Agronomical Sciences, Mouloud Mammeri University, TiziOuzou, Algeria

\*Corresponding author e-mail: [rachid\\_meddour@yahoo.fr](mailto:rachid_meddour@yahoo.fr)

**Abstract:** Algeria imports almost all its needs in aromatic and medicinal plants, unlike other Maghreb countries, despite the productive potential of our country. In 2016, nearly 4,000 herbalists specialized in the marketing of plants used in traditional medicine practice this activity freely throughout the country. The purpose of this study is to undertake an analysis of the MAP sector, including their marketing by herbalists, in the region of Kabylia (North Central Algeria). The methodological approach is based on a quantitative survey conducted through a structured interview among 27 herbalists in the cities of Bouira (12 herbalists) and Tizi Ouzou (15 herbalists). The results show that the profile of the herbalists corresponds to one man (92.6%) belonging mainly to the age group of 31-40 years (44.4%) and of a secondary or university (37%) level (25.9%). He practices his profession by passion (51.9%) or for a commercial purpose (37%), for less than 10 years (56%), and holds his knowledge on medicinal plants mainly by legacy of family knowledge (55.6%). It sells MAPs only according to customer demand (70.4%). Concerning the MAPs marketing circuit, herbalists consider it to be formal (92.6%) and well or fairly well organized (74%). These herbalists mainly buy supplies from foreign markets supplied by foreigners, such as Algiers (72.2%) and Sétif (83.3%), the largest in Algeria. However, more than half (51.8%) of these herbalists report using local MAPs collectors as well, who estimate that wild plant collection is not controlled (72.7%). The origin of imported MAPs is very diverse, but they come almost entirely from supplier countries on a global scale, such as Asian countries (China 65%, India 45%, and Pakistan 10%) and Arab-Muslim countries (Egypt 45%, Saudi Arabia 20%, United Arab Emirates, Jordan, and Syria, with 15% each). MAPs such as Galangal, Cardamom, Roselle, Star anise, Cubeb, Clove, Ginger and Marine and Indian costs are mentioned. A sum of 98 aromatic and medicinal plants was sold in all the herbalists in the two study towns. The number of MAPs sold in these herbalists is an average of 54. The vast majority of herbalists (85.2%) say that demand for MAPs has been



growing sharply over the last two decades, thanks to their therapeutic virtues, effectiveness, absence of side effects and their reasonable price, unlike conventional medicines. This survey of herbalists has shown that 12 species are the subject of the most important demand from consumers (Sage, Chamomile, Rosemary, Jujube, Senna, Mediterranean buckthorn, Pellitory-of-the-wall, Nettle, Marjoram, Lavender, African rue or Harmel, and Green Anise). Their prices and that of other aromatic and medicinal plants generally vary from 100 to 250 DZD (0.7 to 1.77 €) / 100 g; they are fixed according to their availability (55.6%) or demand (44.4%). Finally, several suggestions for the development of the MAP network in Algeria were made by the herbalists surveyed, such as the opening of training centers in herbalism, the creation of many local MAPs markets that exist in Algeria and the improvement of quality control of imported medicinal plants.

**Key Words: MAP Sector, Herbalists, Marketing, Price, Origin, Import**



## Antioxidant Effects of Flavonoids Isolated Some Aromatic And Medicinal Plants

Ramazan ERENLER

Department of Chemistry, Faculty of Arts and Sciences, Tokat Gaziosmanpaşa University, Tokat, Türkiye

*\*Corresponding author e-mail: rerenler@gmail.com*

**Abstract:** Aromatic and medicinal plants play a highly significant role in the drug discovery and development process due to the including the bioactive secondary metabolites. Flavonoids are a broad class of secondary plant phenolic characterized by the flavan nucleus. Flavonoids have been reported to exhibit a large number of biological activities. In our studies, quercetin-3-*O*- $\beta$ -galactoside (**1**), quercetin-3-*O*- $\beta$ -xyloside (**2**), apigenin (**3**), ferulic acid (**4**), vitexin (**5**), luteolin-7-*O*- $\beta$ -glycoside (**6**), luteolin-7-*O*- $\beta$ -xyloside (**7**) were isolated from some aromatic and medicinal plants. The structures of isolated compounds were elucidated by spectroscopic methods such as 1D-NMR, 2D-NMR, LC-TOF/MS. DPPH<sup>•</sup> scavenging effect, ABTS<sup>•+</sup> scavenging activity, and reducing power (FRAP) were performed for antioxidant assays of isolated compounds and all flavonoids displayed the outstanding antioxidant activities.

**Key Words:** Natural Products, Antioxidant Activity, Chromatography, Spectroscopy.



## The Uses of Weeds as Medicinal and Aromatic Plants and Weed Control in These Plants

Ramazan GÜRBÜZ<sup>1</sup>

Harun ALPTEKİN<sup>2</sup>

<sup>1</sup>Department of Plant Protection, Faculty of Agriculture, Iğdır University, Iğdır, Türkiye

<sup>2</sup>Department of Agricultural Sciences, Institute of Science, Iğdır University, Iğdır, Türkiye

\*Corresponding author e-mail: [r\\_grbz@yahoo.com](mailto:r_grbz@yahoo.com)

**Abstract:** It is known that the curative plants have been used in diseases as traditional medicines, since the beginning of human history until today. According to the data of the World Health Organization, 80% of the population in under developed countries use traditional medicines for treatment, while this rate is around 40% in developed countries and it is expected that the utilization rate of medicinal plants in the future will increase all over the world. Medicinal and aromatic plants are used as; food, medicine, cosmetics, spices and as well as many uses. According to World Health Organization (WHO) research, the number of medicinal plants used for therapeutic purposes is around 20,000. While medicinal and aromatic plants are first collected in nature, they are cultivated in order to meet the needs and obtain quality products in recent years. The medicinal and aromatic plant which is wild in nature and which is collected brings some problems with their cultivation. Weeds are the most important of these problems. As in other cultivated plants, weeds are the leading factors limiting the production of medicinal and aromatic plants. In medicinal and aromatic plants, weeds serve as crop competitors, create problems for harvesting and can be mixed with the harvested crop. Weeds may also have negative effects on the active compounds in medicinal and aromatic plants. However, the chemical controls of weeds in medicinal and aromatic plants are scarcely used because of herbicide residues. Consequently weed control become more important in these plants cultivation. Despite these problems, weeds, which are an important part of the ecosystem, are used in many fields such as human food, animal feed, beekeeping, fuel, green manure, food and shelter for wildlife and ornamental plants. There are many problematic weed species of agricultural and non-agricultural areas such as; Meadow clover (*Trifolium pratense* L.), Shepherd's purse (*Capsella bursa-pastoris*), Milk thistle (*Silybum marianum* L.), Wild mustard



(*Sinapis arvensis* L.), Dandelion (*Taraxacum officinale* L.), plantain (*Plantago lanceolata* L) and many others can be used as medicinal and aromatic plants. By collecting such weeds for medicinal and aromatic purposes from agricultural and non-agricultural areas in the same time weed control can be provided. Such weeds have great potential for use as a pharmaceutical product source or as a medicinal plant. This review discusses the problems caused by weeds in the cultivation of medicinal and aromatic plants and also to use some important weeds which are problematic in agriculture and non-agricultural areas as medical and aromatic plants.

**Key Words: Medicinal Plants, Aromatic Plants, Weed Control, Medicinal Uses of Weeds**



## Investigation of the Changes in the Production of Some Medicinal Aromatic Plants by Multivariate Statistical Methods

Recep BİNDAK<sup>1</sup>, Ali ÖZKAN<sup>2</sup>, Nagihan KILIÇ<sup>3</sup>, Duygu AKDUMAN<sup>4</sup>, Muhittin KULAK<sup>3</sup>

<sup>1</sup>Technical Sciences School, Gaziantep University, Gaziantep, Türkiye

<sup>2</sup>Department of Gastronomy, Faculty of Culinary & Arts, Gaziantep University, Gaziantep, Türkiye

<sup>3</sup>Vocational School of Technical Sciences, Department of Herbal and Animal Production, Iğdır University, Iğdır, Türkiye

<sup>4</sup>Vocational School of Technical Sciences, Landscape and Ornamental Plants Program, Iğdır University, Iğdır, Türkiye

*\*Corresponding author e-mail: [bindak@gantep.edu.tr](mailto:bindak@gantep.edu.tr)*

**Abstract:** Medicinal plants are used as a medical resource in almost all cultures, so the demand for plant-derived products has increased across the world. In the Middle East, Asia, Latin America and Africa more than 80% of the populations rely on traditional medicine, especially on plant medicines, for their health care needs. It is possible to say that herbal medicine has an increasing market. In this study, production amounts of some medicinal and aromatic plants were investigated. The data of anise, carobs, chilies pepper, hempseed, linseed, tea, vanilla plants were obtained from FAO database. The major producer countries were clustered with hierarchical Cluster analysis with double dendrograms. The change has been determined by taking into consideration the cultivation areas (ha) and production amounts (ton) of last 14 years. Linear regression was performed to explore the trend of increase or decrease of the product amount for each country.

**Key Words:** FAO, Medicinal and Aromatic Plant, Production, Multivariate Statistics



## **Preliminary Investigation of The Use of Anti-Inflammatory Plants from a Population of Western Algeria**

Sadia MANSOUR

Pharmacognosy and Api-Phytothérapie Laboratory, Biology Département, Ibn Badis University of Mostaganem, Algeria

*\*Corresponding author e-mail: [mansoursadia@gmail.com](mailto:mansoursadia@gmail.com)*

**Abstract:** Inflammation is a usually beneficial process since it allows the elimination of the pathogen and repair tissue damage, but it can become harmful because of the aggressiveness of the pathogen, its persistence and abnormalities of the pathogen and regulation of the inflammatory process. Although anti-inflammatory therapy can give very positive results, the undesirable effects of these drugs requires to find alternative treatments through herbal medicine. Herbal medicine has long been used to treat different diseases. In Algeria, the plants are used for their anti-inflammatory effect for centuries, this use is inspired by traditional Arabic medicine, however, it does not follow precise rules and does not necessarily take into account the new necessities of the current therapy. The objective of this work is the evaluation of the use of anti-inflammatory plants by a group of people living in western Algeria (patients, witnesses, practitioners and herbalists) via questionnaires addressed to them. The results obtained show that 67.5% of the patients do not use the anti-inflammatory plants. Whereas 80% of the controls use the plants for different effects (antidiabetic ... etc). For practitioners, they preferred the combination of drugs and plants. Otherwise, herbalists they show a strong demand for certain anti-inflammatory plants (Pyrethrum, Angelique, Coloquinte). In conclusion, in western Algeria, anti-inflammatory herbal medicine is used in general, but this practice is restricted in patients with inflammatory diseases.

**Key Words: Inflammation, Phytothérapie, Anti-Inflammatory Plants, Algerian Western Population.**





## **An Ethnobotanical survey of medicinal plants used in the treatment of diabetes in some regions of Algeria**

Sadjia RABHI<sup>1</sup>, Henia SAIB<sup>2</sup>, Razika CHEIKHI<sup>1</sup>, Khaoula SIFI<sup>1</sup>, Aicha BELKEBIR<sup>2</sup>

<sup>1</sup> Laboratory of Ethnobotany and Natural Substances (LESN), Department of Natural Sciences, High Normal school of Kouba, Algiers, Algeria.

<sup>2</sup> Laboratory of Biology and Physiology of Organisms, Faculty of Biological Sciences, University of Science and Technology Houari Boumediene, Algiers, Algeria.

*\*Corresponding author e-mail: [sadjiarabhi@gmail.com](mailto:sadjiarabhi@gmail.com)*

**Abstract:** The herbal remedies are considered as great sources of active substances used in treatment of many diseases, including diabetes. These plants are potential natural remedies that can be employed in curative and preventive treatment. The objective of the present study is to identify the plants used in the treatment of diabetes and compare their effect with conventional anti-diabetic treatment. The present survey was performed with 60 traditional healers, 50 patients and 10 diabetes doctors in three regions of Algeria (Algiers, Tipaza and Blida) by direct interviews. In this context, a questionnaire form including items corresponding to the demographic characteristics of the patient (age, sex, level of education), diseases (type of diabetes, age of diabetes, treatment used, presence or absence of complications) and the plants used (plant names, methods of use, reasons for their use and their side effects). The results showed that few patients were using traditional medicine but coupled with medical care. No cases were recorded using single herbs due to fear of complications in particular type I diabetes since insulin for them is the basis for glycemic control. Most cases of medicinal plant uses are made early in the development of the disease to lower blood glucose levels without the use of pharmaceutical drugs that can lead to complications. 4% felt better and 50% said they felt no difference in fact they were using treatment irregularly. Generally 94% of herbal users did so intermittently while 6% used them permanently. About 61% of them used herbal therapy at the beginning of their disease compared to 39% after the development of the disease. On the other hand, the results showed that the majority of plant therapists and herbalists (81%) recommend patients to continue treatment of medicinal plants without interruption and at the same time with medications since this traditional treatment is considered as dietary supplements. Diabetes doctors are against the use of medicinal plants regardless of the health status of their patients.



Along with the present study, thirty-two medicinal plant species were recorded. Of those species, *Artemisia herba-alba* Asso (25%), *Marrubium vulgare* L. (19 %), *Apium graveolens* L. (14 %), *Olea europaea* L. (11 %), *Cinnamomum zeylanicum* Blume. (11 %), *Ruta graveolens* L. (6%) were more common. Viewing the complications of chronic diseases such as type I diabetes in particular and diabetes gestational will always require serious medical monitoring. But other cases, pre-diabetes or people with type II diabetes can benefit from the virtues of medicinal plants in regulation of their blood sugar levels and in prevention of diabetes complications.

**Key words: Diabetes, Herbal Medicine, Algeria, Ethnobotany.**



## **Effects of Topical Administration of Non-Steroidal Anti-inflammatory Agent Diclofenac Sodium Biological Activities on Human Skin**

Seda KESKİN, Murat Çetin RAĞBETLİ

Department of Histology & Embryology, Faculty of Medicine, Van Yuzuncu Yil University, Van, TÜRKİYE

*Corresponding author:* [sedakeskin@yyu.edu.tr](mailto:sedakeskin@yyu.edu.tr)

**Abstract:** Topical analgesics are often used in acute and chronic painful conditions, delivering nonsteroidal anti-inflammatory drugs (NSAIDs) such as diclofenac sodium (DS) directly to the site of injury to relieve pain. DS is a low molecular weight NSAID agent that has strong anti-inflammatory, analgesic and antipyretic effects on tissues. DS represents a widely prescribed group of analgesic and anti-inflammatory agents used to treat a variety of acute and chronic painful conditions. The use of NSAIDs in a topical formulation may be beneficial in reducing the likelihood of a patient experiencing adverse effects associated with systemic therapy. Medications applied directly to the skin are either intended for local action or systemic effects. Topically applied medications (e.g., topical patches, creams, gels, ointments, solutions, etc.) are intended to reach local tissue to achieve the desired therapeutic effect. In the fields of dermatology and orthopedic surgery, the topical use of various oral non-steroidal anti-inflammatory agents has been tried recently, and the topical anti-inflammatory activities at the applied sites have been investigated successfully. The present review describes various effects of non-steroidal anti-inflammatory drugs with their advantages and limitations on dermalstructures.

**Key Words:** Diclofenac Sodium, NSAIDs, Skin, Topical Application



## **Determination of Total Phenol, Flavonoid and Tannin in *Thymus vulgaris* Extracts**

Seddiki ASMAA, Bachir raho GHALEM, Hakem OMAR

Laboratory of Process Engineering and Chemistry of Solutions, University of Mascara, Algeria, 00213771063841

\*Corresponding author e-mail: [bachir\\_raho@yahoo.fr](mailto:bachir_raho@yahoo.fr)

**Abstract:** Thyme (*Thymus vulgaris* L.), locally known "zaatar", a member of the Lamiaceae family, is widely used in medicine for its expectorant, anti-tussive, anti-bronchitic, antispasmodic, anthelmintic, carminative and diuretic properties, which made it one of the most popular plants worldwide. The objective of the present study is to evaluate the total phenol, flavonoid and tannin contents in commercial *Thymus vulgaris* Extracts. For the determination of the total phenolics contents, the Folin-Ciocalteu procedure was used. The content of total flavonoid present in the extracts was measured using aluminum chloride assay. Condensed tannins were determined according to the method by Julkunen-Titto. *T. vulgaris* extract contained the total phenol of 17.8mg of GAE/g of extract and flavonoids of 12.49as mg of quercetin equivalents (QE), and tannins of 5.66 as mg of catechin equivalents (CAE).

**Key Words:** Total Phenol, Flavonoid and Condensed Tannin, *Thymus vulgaris* Extracts.



## Cultivation Opportunities for Medicinal and Aromatic Plants in Iğdır

Sezgin SANCAKTAROĞLU

Department of Agricultural Sciences, Institute of Science, Iğdır University, Iğdır, Türkiye

\*Corresponding author e-mail: [sezginsancak@gmail.com](mailto:sezginsancak@gmail.com)

**Abstract:** Medicinal and Aromatic Plants which have medicinal importance and therapeutic properties have been used for thousands of years without losing their importance. Besides, spices, various herbal teas, plants used in perfumery, cosmetics, dyeing industry and similar fields, and even aromatherapyplants are also included in this group. In particular, the diversity of the uses of these plants accordingly diversifies the fields of science that examine them, as well as increasing the value of these plants and their active substances both in terms of utilization and economic benefits. Medicinal and Aromatic Plants are usually collected from nature. Abundant quality plants can only be obtained by growing them. There are different breeding techniques for each plant. The presence of effective substances reaches the highest level in certain phases of vegetation periods in various organs of plants. Fresh plants should be dried and stored with the right techniques to be able to use drugs for different purposes. When compared in terms of plant geographical regions, Türkiye's endemic plants are seen in the greatest number in regions of Mediterranean and Iran-Turan regions. In Iğdır, there are families such as *Apiaceae* (Umbelliferae), *Asteraceae* (Compositae), *Fabaceae* (Leguminosae), *Lamiaceae* (Labiatae) and there are some species from various families such as *Achillea* spp., *Artemisia* spp, *Chenopodium*, *Salvia*, *Thymus*, *Ziziphora*, *Allium*, *Polygonum*, *Rumex*, *Rosa* and *Verbascum*. All these opportunities of Iğdır region should be benefited with the scientific examination of the plants, the protection of endemic plants, the cultivation of various important and economically valuable plants and their contribution to the national economy. In Iğdır, lavender, rosemary, and similar plants are being studied. Some parts of Iğdır are in good condition for soil fertility and low rainfall and irrigation problems can be an obstacle. In these places, plants that do not need much water can be activated. In some regions, Medicinal and Aromatic Plants can be used as alternative plants. As these plants are perennial, the inconveniences of annual planting are eliminated. After conducting soil analyses in and around Iğdır, suitable ones among these plants can be chosen to grow in the region. For example, if the



cultivation of flowering plants such as Lavender or red rose is chosen in a suitable village, ecotourism can be revived there. Especially the rose which is located in the western part of Iğdır and in the villages close to the Armenian border, to cultivate and even to obtain essential oil from it, can contribute to the local population and Iğdır economically. Even if the agricultural lands of Iğdır are not sufficient, Medicinal and Aromatic Plants can be evaluated at least in the domestic market. When all the problems and possibilities examined for Iğdır province are evaluated; firstly, irrigation and salinity problems should be solved and soil improvement applications should be done. Besides, soil analyses should be carried out first in a field, followed by the arrangements for irrigation facilities and a plant growing plan should be made accordingly. In Iğdır, the cultivation of these plants, which are scientifically important and economically valuable, should be supported and facilitated. Economic development should be provided in the province, and there should be efforts to increase domestic and foreign demand. The government supports some producers in various fields. It is desirable that these supports increase in the fields of Medicinal and Aromatic Plants and that supports and projects can be sustainable since it is absolutely necessary to continue to cultivate these valuable plants that are cultivated not only in Iğdır but also in our country and even in the whole world. However, while cultivating these plants and also in examining and using these plants in different areas in various respects, only those who are specialized in their field should be resorted.

**Key Words: Medicinal and Aromatic Plants, Cultivating, Active substance, Iğdır.**



## Natural Sun Protection Effect of Silk Peptides

Şebnem KÜÇÜK<sup>1</sup>, Ufuk KOCA ÇALIŞKAN<sup>2</sup>

<sup>1</sup>Febs Biyoteknoloji, Kızılırmak mah.1431. cad 27/2, Ankara, Türkiye

<sup>2</sup>Gazi University, Faculty of Pharmacy, Department of Pharmacognosy, Ankara, Türkiye

\*Corresponding author e-mail: [ukoca@gazi.edu.tr](mailto:ukoca@gazi.edu.tr)

**Abstract:** In current years, the harmful effects of the UVA wavelengths of sunlight have been causing more serious conditions such as dermatological problems and moreover skin cancers. Sun protection products have been the focus of human being, especially for kids. Many Sun protection products have long been used to protect against sun light induced erythema with the performance indicated by the sun protection factor (SPF). Silk is one of the natural material having SPF. Silk, which originally came from China, known as a luxury fabric in the whole world. Scientists had been very curious about the silk structure, recently, silk fiber and silk amino acids became the center of an important research topic for biotechnology. Silk is made of two parts peptides that are sericin and fibroin. Sericin appears to beneficially affect the skin as a protective (anti-oxidation, anti-UV radiation) and as a rich moisturizer agent. These effects may be seen with both oral and topical applications. In this study, we aim to demonstrate the UV efficacy of silk peptides by using two different SPF creams with same formulas but one of each is enriched with silk peptides. We evaluated sunprotection value with in vitro method that is accepted by Colipa. This method provides two metrics describing the UVA protection of a sunscreen. Firstly ,the method provides in vitro UVA protection factors (UVA-PF) which have been shown to correlate well with in vivo UVA-PF values derived from the PPD method. (the latter being considered as the in vivo reference) Secondly, the method also provides a means of calculating Wavelength values. As a result, SPF cream with ‘**silk peptide**’ scan were **SPF 50.87**, T(UVA) 8.68%, T(UVB) 1.52%, lambda critical 378.92 (number of scans :12, UVA/UVB ratio= 0.699). Whereas, scan results of the SPF cream without silk peptide were **SPF 39.31**, T(UVA) 6.71%, T(UVB) 2.27%, lambda critical 382.08 (number of scans :12, UVA/UVB ratio= 0.795).It was observed that the silk peptides have a strong protective property, especially in terms of UVA activity.



UVA radiation is the main concomitant cause of skin photosensitization and phototoxicity, whereas, UVB radiation has been known for immediate and evident skin damages. Therefore besides all these benefits of silk peptides in cosmetics, it can also be used as a UV protectant.

**Key words: Silk Peptides, UV Protection, SPF**





## Chemical Characterization of Two Local Lines of *Cannabis sativa* L. Under Warm Temperate Climatic Conditions of Ankara

Nilgün BAYRAKTAR<sup>1</sup>, Turan YANARDAĞ<sup>2</sup>,  
Yasin ÖZGEN<sup>3</sup>, Yağmur Kahraman YANARDAĞ<sup>4</sup>

<sup>1,3,4</sup>Department of Field Crops, Faculty of Agriculture, Ankara University, Ankara, Türkiye

<sup>2</sup>Department of Chemistry, Faculty of Science, Ankara University, Ankara, Türkiye

\*Corresponding author e-mail: [tyanardag@ankara.edu.tr](mailto:tyanardag@ankara.edu.tr)

**Abstract:** Cannabis plants are grown since millions of years as they have wide adaptability to grow on all types of soils subject to availability of appropriate sunlight, temperature and humidity. They are primarily grown to obtain cannabinoids (terpenophenolics) for medicinal purposes. They are also used to obtain fibers for their use in textile industry. Türkiye has seven major geographic regions; where, cannabis can be grown economically under natural conditions. It has very light seed that can be easily carried to other places by wind, bird droppings, and insects and by attaching to animal bodies. There are very meagre studies on chemical and morphological characterization for better use in industry; therefore, it is desired to select and breed appropriate cannabis lines and varieties for larger use. This study aimed chemical characterization of compounds found in essential oils of 2 local cannabis lines namely Uşak and Kastamonu at three harvesting times using HPLC. In total, more than 30 compounds were identified, and the analysis revealed that  $\alpha$ - and  $\beta$ -pinene,  $\beta$ -myrcene and  $\beta$ -caryophyllene are the major components.

**Key Words:** Aromatic, Central Anatolia, Essential oil Components, HPLC, Terpenic Compounds



## Potential Use of Extracts Obtained from *Cannabis sativa* L. as a Corrosion Inhibitor

Nilgün BAYRAKTAR<sup>1</sup>, Turan YANARDAĞ<sup>2</sup>,  
Yasin ÖZGEN<sup>3</sup>, Yağmur Kahraman YANARDAĞ<sup>4</sup>, Ali Abbas AKSÜT<sup>5</sup>

<sup>1,3,4</sup> Department of Field Crops, Faculty of Agriculture, Ankara University, Ankara, Türkiye

<sup>2,5</sup> Department of Chemistry, Faculty of Science, Ankara University, Ankara, Türkiye

\*Corresponding author e-mail: [tyanardag@ankara.edu.tr](mailto:tyanardag@ankara.edu.tr)

**Abstract:** Cannabis plants are important medicinal plants that are grown and found in almost every part of Türkiye and can be grown economically in areas with ample sunlight, temperature and humidity. The plants contain many chemical compounds obtain from cannabinoids (terpenophenolics). Electrochemical analysis performed by open circuit potential (OCP), electro chemical impedance spectroscopy (EIS) and current potential curves verified showed that the chemical compounds had corrosion inhibition potential of around 98%. It is established that these compounds could serve as corrosion inhibitor depending on their harvest time and the region of collection. This study aimed to find anti corrosion effects of the terpenoids found in Cannabis obtained from line Diyarbakır to evaluate its anticorrosion characteristics.

**Key Words:** Anti Corrosion, Line Diyarbakır, Central Anatolia, Terpenic Compounds



## **Training in Cosmetic Status in Türkiye.**

**Belkis MUCA YİĞİT**

Vocational School of Technical Sciences, Iğdır University, Iğdır, Türkiye

*\*Corresponding author e-mail: [belkis.muca@igdir.edu.tr](mailto:belkis.muca@igdir.edu.tr)*

Recently, researches on cosmetics have increased in Turkey. The researchers are being done such as aromatic plants, plant chemistry, the health of cosmetic products and etc., but there isn't more research about the education of cosmetic in Turkey. Beauty and hairdressing education have given in high school programs in Turkey. The faculty on cosmetic and cosmetic production haven't opened at the universities of Turkey until now. Cosmetic Technology Programs have found in 4 vocational schools in the universities of Turkey. If we investigate these school's curriculum, we can see that there are only chemistry lessons. Cosmetic Technology Programs are not included raw material sources lesson, the lesson of methods of producing from raw materials, the lesson of quality of the cosmetic product, waste control lesson, environment laws lesson, marketing lesson, and packaging design lessons in the curriculum. This study was conducted to draw attention to shortcomings related to cosmetic education in Turkey. It had also made to emphasize the expected work in this area. Turkey must be increased research in this area. It is especially important that cosmetic education is carried to the faculty level in Turkey. A new structuring should be made in cosmetic education. Training staff must be specialized biologists, chemists, health experts, and artists (to develop ideas on packaging design). In addition, practical training should be given instead of theoretical and product development lessons should be brought to the fore. In this way, the rich resources of raw materials in Turkey can be brought into the market in a better way. In this field, with the increase of experts in cosmetic technology in our country can show great improvement. We can also create our own brands and bring them to a good point around the world.

**Key Words: Education, Cosmetic, Chemistry, Biology, Medicine, Türkiye.**



## Comprehensive Biological Activities of Essential Oils Distilled From Some Selected Medicinal Plants

Sevgi Gezici<sup>1,2</sup>, Nazim Sekeroglu<sup>2,3</sup>, Maryna Kryvtsova<sup>4</sup>

<sup>1</sup> Department of Molecular Biology and Genetics, Faculty of Science and Literature, Kilis 7 Aralık University, Kilis, Turkey.

<sup>2</sup> Advanced Technology Application and Research Center (ATARC), Kilis 7 Aralık University, Kilis, Turkey.

<sup>3</sup> Department of Horticulture, Faculty of Agricultural Engineering, Kilis 7 Aralık University, Kilis, Turkey.

<sup>4</sup> Department of Genetic, Plant Physiology and Microbiology, Faculty of Biology, Uzhhorod National University, Voloshina str.,32, Uzhhorod, Ukraina.

\*Corresponding author e-mail: [drsevgigezici@gmail.com](mailto:drsevgigezici@gmail.com), [sevgigezici@kilis.edu.tr](mailto:sevgigezici@kilis.edu.tr)

Essential oils (EOs), aromatic secondary metabolites obtained from flower, buds, seed, leaves and fruits of plants, are known to possess valuable activities for treatment and management of various diseases. The presented study was aimed to reveal anti-cancer, anti-proliferative, anti- microbial and anti-neurodegenerative potentials of the EOs obtained from *Satureja montana* L. (SM-savory oil), *Nigella sativa* L. (NS-cumin seed oil), *Melissa officinalis* L. (MO-lemon balm oil), and *Cinnamomum verum* (CV-cinnamon oil), which are traditionally used in folk medicine. Anti-cancer and anti-proliferative activities of the EOs were determined using MTT and trypan blue exclusion assays, towards MCF-7, C6, and HeLa human cancer cells, and non-tumorous HUVECs. The cells were treated with the EOs in the concentrations ranged from 6.25µg/mL to 200µg/mL for 24, 48, and 72hrs. The anti-cancer results were calculated as IC<sub>50</sub> value, and anti- proliferative activity results were expressed as cell viability percentage. Their anti- neurodegenerative potentials were tested through enzyme inhibitory assays against AChE, BChE, and TYR that are closely related to pathogenesis of neurodegenerative diseases. The sensitivity of microorganisms against the EOs was determined by agar diffusion test using typical *Candida albicans* (ATCC885-653); *Staphylococcus aureus* (ATCC25923); *Escherichia coli* (ATCC25922); *Enterococcus faecalis* (ATCC29212); *Streptococcus pyogenes* (ATCC19615) strains, and their clinical strains isolated from oral cavities of patients suffering from inflammatory periodontium and pharynx. The EOs exerted significant cytotoxicity against



the tested cancer cells with IC<sub>50</sub> values varying from 4.68±0.74 to 129.35±0.95 µg/mL, even at the lowest concentration. The highest cytotoxicity and cell death were determined in CV-EO on C6 cells, the lowest ones were observed in MO-EO towards HeLa cells. Regarding of neuroprotective potentials, NS-EO was the most promising amongst the evaluated EOs, which was followed by CV-EO, SM-EO, and MO-EO, respectively. NS-EO, CV-EO and SM-EO caused higher inhibition towards ChE enzymes than TYR, whilst MO-EO caused higher inhibition on TYR enzyme. The antimicrobial results proved the wide spectrum of antimicrobial activity of CV-EO, and the highest antimicrobial activity was determined against the typical and clinic strains of *E. faecalis* and *C. albicans*. The SM-EO was found to have high level of antibacterial activity, towards gram-positive and gram-negative bacteria strains, with no antimycotic activity. As for the lemon balm EO, it showed only effect on gram-positive bacteria.

**Keywords: Essential oils; cancer; neurodegeneration; anti-proliferative; anti-microbial**



## THE ETHNOBOTANICAL PROPERTIES OF SOME PLANTS GROWING IN ADIYAMAN

Ahmet Zafer TEL<sup>1</sup>, Merve Kevser FURKAN<sup>2</sup>

<sup>1</sup>*Adiyaman University, Faculty of Arts and Sciences, Department of Biology, Adiyaman, Türkiye*

<sup>2</sup>*Adiyaman University, Graduate School of Natural and Applied Sciences, Department of Biology, Adiyaman, Türkiye*

\*Corresponding author email: [ahmetzafertel@yahoo.com](mailto:ahmetzafertel@yahoo.com)

**Abstract:** This study was carried out between the years of 2013 and 2015 to determine the ethnobotanical properties of some of the taxa grown in Adiyaman. According to Grid system of Turkey, Adiyaman enters into the squares B7, C6 and C7. During this study, one to one interviews were conducted with some of the local people, surveys have been used on some of the other local people, and the expertise of the local herbalists/users in the region were obtained and included in the results section. The results of the study showed that 223 taxa from 64 different families grown in Adiyaman were identified by terms of value and importance of ethnobotany. We determined and classified the ethnobotanical value and importance of the 223 taxa as follows: 118 of these medicinal plants (45 of these were used only as medicinal plants), 117 of these were consumed as foods (41 of these were consumed only as foods), 29 of these were used in homes as appliances and tools, 26 of these were utilized as ornamental plants, 24 of these were used as animal feed, 18 of these were used as firewood, 15 of these were utilized as kitchen tools and supplies, 11 of these were used as construction materials, 9 of these were used in industry, 7 of these were utilized as timber, 6 of these were used as toys, 3 of these were utilized as cosmetics, 2 of these were used for religious purposes, 2 of these were used for incense, one of these was used in folk dances and 7 of these were used for the other purposes. There are 10 taxa of the 223 taxa that are not in the literature yet and their ethnobotanical uses determined by this study for the first time.

**Key Words:** Ethnobotany, Adiyaman, Turkey



## **Antioxidant Properties of Some Herbs and Spices Traditionally Used in Middle-East Food Preparation**

Duried ALVAZEER

*Center for Redox Applications in Foods (RCRAF), Iğdır University, Türkiye*

*\*Corresponding author email: [alwazeerd@gmail.com](mailto:alwazeerd@gmail.com)*

**Abstract:** Antioxidant activity forms an essential component of bioactive properties of plant products. Three types of aqueous extracts of four herbs and spices were prepared. The antioxidant properties were evaluated by measuring the total phenolic content, DPPH radical scavenging activity and oxidoreduction potential methods. The antioxidant results showed that all extracts contained phenolic compounds with a total phenolic content ranged from 22.68 to 51.63 mg GA/g. All the aqueous extracts could scavenge the radical DPPH with significant differences ( $P < 0.05$ ) with values ranged from 32.95 to 84.84%. The phenolic content linearly correlated ( $R^2 = 0.827$ ) with DPPH scavenging activity of the studied plants following the order: sumac > ginger > rosemary > cinnamon. The oxidoreduction potential values linearly correlated with both the phenolic content ( $R^2 \approx 0.88$ ) and DPPH scavenging activity values ( $R^2 \approx 0.96$ ). The oxidoreduction potential could be proposed as a useful companion tool combined with other techniques when determining the antioxidant activity of plant extracts and food products is considered.

**Keywords:** Sumac, Rosemary, Cinnamon, Ginger, Antioxidant Activity, Phenolic content, Oxidoreduction Potential.



## Local Products From Türkiye Roses (*Rosa L. spp.*) and Their Importances for Health

Hasan ÖZÇELİK

Süleyman Demirel University, Science and Literature Fac., Dept. of Biology, Isparta, Türkiye

\*Corresponding author email: [hasanozcelik@sdu.edu.tr](mailto:hasanozcelik@sdu.edu.tr)

**Abstract:** There is a well-established history of Turkish people to benefit from plants. Recently, some of these products have been brought to the industrial sector. Consumers prefer handmade products, along with a decrease in the cost of mass-produced products. In this presentation, names and brief introduction of the products produced from natural and old garden roses of Türkiye are being described. Important ones from these products are being named and described in the presentation.

The emphasis is on the names and health of roses products that are produced in our work. The works were done by classic methods. Plant materials generally collected from mountains in Lakes Region and in 2014-2017 years. Some specimen was collected from SDU. Botanical Garden (Isparta) and worked in Ecological Product Laboratory of Science Faculty of SDU (Isparta).

**For food purposes:** Rose Syrup, Rose Melissa, Rose Circle, Gullaç, Rose Preserve, Rose Tea, Rosehip Tea, Rosehip Marble, Delight with Rose leaf;

**For pharmaceutical purposes:** Oily Organic Rose Water, Sega Oil;

**For cosmetic purposes:** Rose Water, Rose Cream, Rose Lotion, Rose Colony;

**Raw materials:** Rose Oil, Rose Concrete, Rose Absolute, Vax, Food coloring, Rose Powder;

**For fertilizer purposes:** Microbial Fertilizer, Worm fertilizer, Vermicompost;

**Animal feed:** Fish and bird forages;

**Ornamental items:** Pen/Pencil holders, Pencil stalk, Mouthpiece, Bag, Cane, Rosary prayer rug, Rose scented candle and **Chimney cleaner** etc. are described.

**Key Words:** *Rose products*, **Organic products**, **Food**, **Medicine**, **Cosmetics**.





## New Technological Approaches on Production of Essential Oils from Aromatic Plants

Hasan ÖZÇELİK

*Süleyman Demirel University, Science and Literature Fac., Dept. of Biology, Isparta, Turkey*

*\*Corresponding author e-mail: [hasanozcelik@sdu.edu.tr](mailto:hasanozcelik@sdu.edu.tr)*

**Abstract:** The Mediterranean region is the center of aromatic plants. The Lake region is an important center where aromatic plants are grown and processed in the industry. There are about 25 rose oil factories in the region. These factories produce essential oil from flowers of *R. damascena*, then produce the oils of other aromatic plants. Some factories only produce kongregate of oil rose.

There are three objectives: to dry the crops, to distill them in the field or mountain, and to make the existing plants free of waste. After essential oil production from rose flower or other aromatic plants, then other materials throw out, the waste pollute the environment.

In 2017 year, drying experiments were carried out on industrial furnaces under different conditions and their results were recorded. The results are presented to the customers who have been subjected to sensory and visual tests. This report focuses on the methods of evaluating scum or making unsuitable production from aromatic plants by us. Three technological approaches and innovations have been identified:

1. An easy-to-carry distillation device capable of distilling volatile oil in the field environment.
2. A design was made so that existing plants could be run without waste and more efficient.
3. Drying and pulverizing aromatic plant parts in industrial ovens. In these methods, the aim was first determined, then technical drawings of the works were made. Later experiments on designs were made. It is also stated that for families or small scale producers, the need for the production of small industrial boilers, in which aromatic plants can be distilled outside the factories, and that such a product is manufactured by us. Without waste rose oil factory was made a design. It is succesful fort he purposing. Drying and pulverizing aromatic plant parts in industrial ovens are succcessfull.

**Keywords:** Aromatic plants, Essential oil production, Drying, Powder, New methods.



## FINAL DECLARATION

1<sup>st</sup> International Aromatic Plants and Cosmetics Symposium was successfully held on 3<sup>rd</sup>-6<sup>th</sup> October, 2019 in Iğdır University. The organizing committee of the symposium held at Iğdır University consists of 19 members. Honorary Chairman of the symposium is Prof. Dr. Mehmet Hakkı ALMA, Rector of Iğdır University, Chairman of the symposium is Prof. Dr. Nazan APAYDIN-DEMİR, one of the academics of Muğla Sıtkı Koçman University, and symposium Coordinator is Asst. Prof. Dr. Belkıs MUCA-YİĞİT, one of the academics of Iğdır University. The organizing committee of the symposium is Prof. Dr. Hasan ÖZÇELİK (Süleyman Demirel University), Prof. Dr. Ahmet Zafer TEL (Adıyaman University), Assoc. Prof. Dr. Mehmet Zülfü YILDIZ (Adıyaman University), Asst. Prof. Dr. Muhittin KULAK (Iğdır University), Asst. Prof. Dr. Bahadır AKMAN (Iğdır University), Asst. Prof. Dr. Turhan MOÇ (Iğdır University), Asst. Prof. Dr. Alevcan KAPLAN (Batman University). The secretariat of the symposium is Res. Asst. Fatih YAYLA (Gaziantep University, PhD-c Serap ŞAHİN- YİĞİT (Gaziantep University), Lect. Emine ÖZBEY (Kafkas University), Didem KOÇUM (Kilis 7 Aralık University), Lect. Duygu AKDUMAN (Iğdır University), Lect. Nagihan KILIÇ (Iğdır University). Language consultant is Sezai YİĞİT, webmaster is Mehmet Emir YAYLA and technical support is Turgay KARATAŞ (Iğdır University) and İsmail YÜCEL.

83 scientists from 18 different countries contributed to the scientific committee of the 1<sup>st</sup> International Aromatic Plants and Cosmetics Symposium. In addition to participation from Turkey, scientists from different countries such as India, Iran, Tunisia and Algeria participated to the symposium and 68 papers were presented.

Financial support to the 1<sup>st</sup> International Aromatic Plants and Cosmetics Symposium was provided from Serhat Development Agency, Arzen Cosmetics, Gaziler Plastic, Yeşil Iğdır Newspaper, Iğdır University SRP Coordination Unit and Circulating Capital Unit. In addition, “Current Perspectives on Medicinal and Aromatic Plants”, “Annals of Phytomedicine”, “Commagene Journal of Biology” were also the journals supporting this symposium.

Symposium started with the symposium chairman Prof. Dr. Nazan APAYDIN-DEMİR’s speech titled “An overview to the cosmetic sector and branding”.

On behalf of Serhat Development Agency, Iğdır Province Representative Ramazan Mutlu DOĞANER drew attention to the importance of the cosmetic sector in the development of Iğdır province and the support of the agency in this regard. Asst. Prof. Dr. Turhan MOÇ, one of the members of the symposium organizing committee, mentioned in his opening speech the



importance and future goals of the Cosmetic Technology program, which was opened in Iğdır University Vocational School of Technical Sciences. He also emphasized how important this symposium is for the future of the cosmetic sector in Iğdır. Finally, vice rector of Iğdır University Prof. Dr. Selahattin ÇELEBİ made his speech on behalf of honorary chairman of the symposium Prof. Dr. Mehmet Hakkı ALMA. In his speech, Prof. Dr. Selahattin ÇELEBİ mentioned their support to the symposium and mentioned that various studies are being carried out as Iğdır University.

Invited speaker Prof. Dr. Nazım ŞEKEROĞLU mentioned the damage that the continuity of the generation of the collection of medicinal and aromatic plants from nature in his speech titled “Future Perspectives for Medicinal and Aromatic Plant Production in Turkey”.

He also mentioned the benefits of cultivating these plants in the field. He emphasized that these plants should be characteristically identified correctly before cultivating in the field. In this context, he referred to studies conducted in Turkey. He gave lavender and thyme plants as an example for the studies and he emphasized the economic importance of these plants.

Second invited speaker Rvt. Rana BABAÇ-ÇELEBİ firstly mentioned the history of cosmetics in her speech titled “The Future of Naturals in the Cosmetics Industry; Ancient Knowledge, Modern”. She talked about the historical knowledge of the countries that produce and use cosmetic products from ancient times to today. In addition, Çelebi emphasized the importance of natural cosmetics and talked about their work on the production of cosmetic raw materials.

Third invited speaker Dr. Ahmad ALI described the cream they developed with cyanobacteria *Spirulina platensis*, which has the effect of skin bleaching in his “Assessment of Skin-whitening Effect of Cream Prepared Using Cyanobacteria” titled speech. He also mentioned anti-inflammation, skin bleaching and anti-aging effects of the cream.

Finally, invited speaker Assoc. Dr. Ufuk KOCA-ÇALIŞKAN, one of the academicians of Ankara University, mentioned aromatherapy, antimicrobial effects of essential oils, antibiotic resistance activity, quorum sensing systems in her speech titled “Anti-quorum sensing effect of volatile oils in aromatherapeutic formulations: might be a solution for antibiotic resistance?”. She also described their study on the interaction of different essential oils and combinations of these oils with *Chromobacterium violaceum*. According to the study, all the essential oils tested were found to inhibit the violacein pigment produced by bacteria.

A workshop was held at the end of the first session following the presentations of the invited speakers. The workshop was conducted by the symposium coordinator Asst. Dr. Belkıs



MUCA-YİĞİT, organizing committee member Prof. Dr. Hasan ÖZÇELİK, invited speakers Prof. Dr. Nazım ŞEKEROĞLU and Assoc. Dr. Ufuk KOCA-ÇALIŞKAN and aromatherapist Rana BABAÇ-ÇELEBİ. In this workshop, “Problems and Solutions in Cosmetics Field in Turkey” was subjected. In the workshop, topics such as deficiency in Turkey's cosmetics production, production mistakes, education issues, branding and product quality were mentioned.

As a result of 13 sessions and 1 workshop held within the framework of the symposium, important information was brought to the scientific world. The data obtained at the end of the symposium can be summarized in 14 items:

1. One of the most important problems in the production of cosmetic products is the loss of raw materials into the product. The biggest loss occurs during the transportation of raw materials to the factories. When picking aromatic plants from the field, failure to pay attention to the time of collection and transport errors to the factory causes loss of essential oil from these plants. For this reason, the factories producing cosmetic products should be established in the regions close to the source of raw materials or the essential oil should be obtained under field conditions and delivered to the factories. It was concluded that the distillation process in the field would minimize the loss of essential oil.
2. Many project institutions, especially development agencies, need to support or increase the amount of support in the field of cosmetic quality infrastructure projects. It is concluded that this step, which will provide great benefit in converting our biodiversity into profit and obtaining high quality products, will add significant advantages to the national economy.
3. Factories have serious problems with production. Methods for producing quality raw materials and converting them into products should be developed. The most important solution for this is university-industry cooperation. The bond between universities and industrial organizations needs to be developed and strengthened in a trust environment. Technology transfer offices need to work more actively on this issue. The problems of the stakeholders in the private sector should be identified by the TTO, meetings and workshops should be organized and a university-industry bond should be established. Thus, the production errors of the private sector producers will be prevented and the information produced by the projects or different studies in universities will be delivered to the producer without waiting on the shelves. It is foreseen that when the university-



industry bond is strengthened, sustainable development will be contributed and the number of projects aimed at product development will increase.

4. Universities can develop products to meet the needs of the university and the province where they are located by making production-oriented studies in their own internal management. One of the most important steps to be made in cosmetics sector is that it can be provided by the establishment of a garden where aromatic plants are grown.
5. Good production and zero waste practices need to be expanded. In particular, it will be an important step for food producing factories to convert their production waste into functional products. Since the wastes from food products are natural materials, they can be used in cosmetics. For this reason, it is thought to be a serious subsidiary income source for the productions in the food sector.
6. It has been suggested that quality production, branding and permanence are among the major problems of the cosmetics sector. Quality control should be increased for producers and branding should be given importance. The permanence of a product with high quality production and a good brand will increase in the market. Increasing the quality level will also contribute to this permanence. In particular, working with the university within the framework of the R & D programs to develop the right production techniques will bring an important solution to this issue. It was concluded that it is very important to create a product with a story to increase the brand value of the product.
7. It is stated that the packaging and presentation form of cosmetic products is an important factor determining the value of the products. It is necessary to work with artists to increase this value. It should be remembered that we can achieve very successful results in packaging design and presentation especially considering the richness of our country in the field of art.
8. It was concluded that International Aromatic Plants and Cosmetics Symposium is an important symposium. Iğdır is located in an important center in terms of location. For this reason, it was stated that the symposium should have continuity. AROPCOS was decided to be held in Iğdır province and every two years. 2<sup>nd</sup> International Aromatic Plants and Cosmetics Symposium was decided to be held in Iğdır in 2021.
9. According to the common opinion of the symposium participants and the organizing committee, the short name of the symposium should be branded as AROPCOS. The brand registration was decided before the second symposium was planned.

10. One of the most important outputs of the symposium is the opinion of the scientific journal. It was concluded that AROPCOS should have its own scientific journal. In this way, the full texts of the papers that will be presented within the scope of AROPCOS will be published as a special edition in AROPCOS journal. It was decided to prepare the infrastructure of a journal called **Journal of Aromatic Plants and Cosmetics (JAROPCOS)**. JAROPCOS will be supported by the editors of the CUPMAP and Annals of Phytomedicine journals supporting the AROPCOS symposium. It has been decided that the journal will be published in the academic platform of Dergipark under TÜBİTAK ULAKBİM, which will issue two editions a year.
11. Mustafa BERBER, owner of ARZEN Cosmetics, one of the sponsors of AROPCOS, has proposed to convert the plant potential of Iğdır to cosmetic products. He stated that ARZEN Cosmetics can work in cooperation with Iğdır University. In this way, an exemplary step will be exhibited in the direction that industry-university cooperation can be achieved in Iğdır. Within the scope of AROPCOS, Mustafa Berber has promised to establish a factory in Iğdır with an appropriate project.
12. Considering the Agricultural Faculty and agricultural work opportunities of Iğdır University, the establishment of a medical-aromatic plants garden within the Iğdır University Agricultural Application and Research Center was envisaged. Aromatherapist Rana BABAÇ-ÇELEBİ, one of the invited speakers of AROPCOS, stated that she can provide support for the establishment of this garden with her own Aromatherapy Company. She stated that the Medical-Aromatic Plants Garden to be established at Iğdır University could be the sister garden of Aromatherapy Company.
13. With the contributions of Serhat Development Agency, it has been proposed to organize workshops in cosmetic field in Serhat provinces and in AROPCOS, especially in Iğdır. In these workshops, academicians who are experts in their fields, executives in the sector and development agency officials should come together. In particular, efforts should be made to highlight cosmetics in the development of Iğdır, which has borders to 3 countries.
14. It was concluded that steps should be taken in the cosmetic education. It was emphasized that cosmetic technology should not be limited only within vocational schools. Ideas have been expressed on the necessity of establishing Cosmetics Faculties in the near future. The establishment of faculties that are experts in chemistry, biology, health,



economics and marketing will be an important step in the training of real cosmetics experts.





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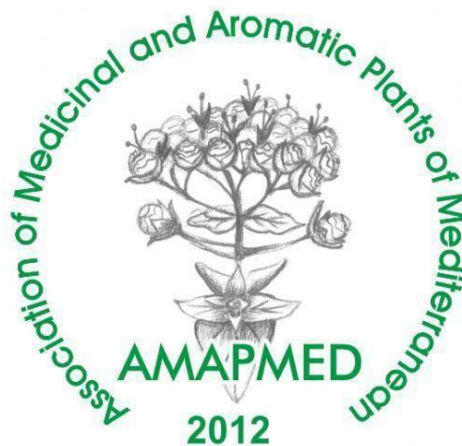
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