

Sayın Araştırmacı;

Türkiye XIII. Ulusal, I. Uluslararası Tarla Bitkileri Kongresi Tarla Bitkileri Bilimi Derneğinin katkılarıyla Isparta Uygulamalı Bilimler Üniversitesi, Ziraat Fakültesi Tarla Bitkileri Bölümü tarafından 01-04.11.2019 tarihleri arasında Antalya Kervansaray Otel Lara'da düzenlenmiştir. Tarla Bitkileri Kongreleri, bu kongreden itibaren Uluslararası Kongre niteliğinde devam edecektir. Bu kapsamda; kongremiz "Akademik Teşvik Puanı Hesaplamada" Uluslararası kongre sayılabilmesi için gerekli en az 5 yabancı araştırmacının bildiri sunma kriterini sağlamıştır. İlgili araştırmacıların isimleri ve bildiri özetleri ekte verilmiştir.

Isparta Uygulamalı Bilimler Üniversitesi Ziraat Fakültesi Tarla Bitkileri Bölümü olarak kongremize katılımınız ve katkılarınız için teşekkür ederiz.

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Sıralı Tohumlamanın Nektarlı Bitkisel Ürünlerin Yetiştirilmesindeki Rolü

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Özet: Sıralı tohumlama, toprağın verimliliğini korumada önemli bir faktördür ve bu nedenle tarımsal üretkenlikte istikrarlı bir artışa katkıda bulunur. Bitkilerin toprak verimliliği, su ve hava rejimi için talepleri farklıdır ve toprağın agrofiziksel özellikleri eşit değildir. Aynı alanda birkaç yıl boyunca bir sebzenin ekilmesi, toprağın verimliliğini zayıflatır ve hastalıkların, zararlı böceklerin ve yabancı otların yayılmasına katkıda bulunur. Bu nedenle bitkiler dikim alanında sıraya alınmalı, yani biri diğerinin yerini almalıdır. Sıralanmada bitkilerin biyolojik, morfolojik özellikleri dikkate alınmalı ve sebzelerin, kavunların ve patateslerin gelişimi için uygun olmalıdır. Bu amaçla, Azerbaycan bölgelerinin toprak ve iklim koşullarının uygun olarak, 2012-2019 yıllarındaki sebze bitkilerinin öncülleri incelenmiştir.

Anahtar kelimeler: Toprak, sıralı tohumlama, sebze, verimlilik, nektar.

Water Needs of Ash-Leaved Maple (*Acer negundo* L.) at the First Three Years of Growing in the Reclamation Plantings in Poland

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Abstract: The survival and growth of seedlings on the reclaimed land depends mainly on the optimal water conditions, which can be effectively controlled by the properly designed irrigation system. The irrigation treatments require prior determination of the plant water needs. The success of the reclamation depends mainly on the initial growth period of the introduced plants. The purpose of the reported research was to estimate the water needs of ash-leaved maple (*Acer negundo* L.) at the first three years of growing as the reclamation plantings in Poland. The water requirements of ash-leaved maple were determined using the plant coefficient. The reference evapotranspiration was calculated using the Blaney-Criddle's formula that was modified for Polish conditions by Żakowicz. The plant coefficients of ash-leaved maple at the first three years after planting that were adapted to the reference evapotranspiration, were applied also according to Żakowicz's recommendations. The water needs of ash-leaved maple were assessed for five different regions of Poland, on average in the years 1981-2010. The highest ash-leaved maple water requirements during the growing period (April-October) occurred in the central-eastern and central-north-western regions, while the lowest – in the north-eastern and south-eastern regions. The largest rainfall deficit during the growing period was in the central-north-western region and the lowest-in the south-eastern region.

Keywords: irrigation, evapotranspiration, reclamation, seedling survival, water requirements

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Intercropping with cumin (*Cuminum cyminum* L.) and fertilizer treatments affecting growth and grain yield of faba bean (*Vicia faba* L.)

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Abstract: In order to investigate the effect of intercropping patterns and fertilizers on growth and grain yield of faba bean (*Vicia faba* L.) an experiment was conducted as factorial based on randomized complete block design with three replications at the Research Farm of University of Tabriz, Iran in 2014. The first factor was four cropping patterns including monoculture of faba bean; intercropping of faba bean with cumin (*Cuminum cyminum* L.) at three levels as 1-1, 2-2 and 4-4 cumin- faba bean intercropping and the second factor was three levels of fertilizers including 100% chemical fertilizer, 50% chemical fertilizer + biofertilizer and vermicompost. Results showed that the greatest faba bean height was observed in 100% chemical fertilizer that was not significantly different with 50% chemical fertilizer + biofertilizer. The interaction effect of fertilizer × cropping pattern was significant on faba bean leaf number. The highest chlorophyll content index (CCI) was observed in 100% chemical fertilizer that was significantly different with 50% chemical + biofertilizer and vermicompost. The faba bean grain yield was significantly affected by fertilizer and cropping pattern. The highest grain yield (1634.2 kg/h) was observed in 100% chemical fertilizer and the grain yield in other fertilizer treatments were not significantly different. The highest land equivalent ratio (LER) was obtained in 1-1 intercropping pattern (1.44) and in 2-2 intercropping pattern the vermicompost had the highest LER (1.35). The faba bean intercropping patterns of 1-1 and 2-2 could be recommended to growers for higher productivity of faba bean and cumin in sustainable agriculture.

Keywords: Biofertilizer, chlorophyll content, land equivalent ratio (LER), leaf number, vermicompost

A comparison of Some Phytochemical Characteristics of Seven Types of *Nigella sativa* Seeds From Different Parts of Iran

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Abstract: *Nigella sativa* seeds use in folk medicine as a natural remedy for a number of disease. The aim of this study was to determine the important phytochemical characteristics of *Nigella sativa* seeds collected from different parts of Iran. Important characteristics of this plant including protein percentage, essential oil percentage, oil content, total phenol and flavonoid content and the radical scavenging activity. According to our results, the *Nigella sativa* grown in Tabriz showed the highest protein (12.29 %), essential oil (0.55 %) and oil content (42.34 %) percentage than other. As well as, the plants were grown in Tekab and Marand areas showed the highest and lowest radical scavenging activity relative to others respectively.

Keywords: *Nigella sativa*, phytochemical properties, Radical scavenging activity, Essential oil

A Comparison of Some Phytochemical Characteristics of Five Types of *Trigonella foenum graecum* Seeds From Different Parts of Iran

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Abstract: *Trigonella foenum graecum* seeds has traditional uses as reconstitute, stimulant, diuretic and expectorant. The aim of this study was to determine the important phytochemical characteristics of *Trigonella foenum graecum* seeds collected from different parts of Iran. Important characteristics of this plant including mucilage percentage, protein percentage, oil content, total phenol and flavonoid content and the radical scavenging activity. According to our results, the *Trigonella foenum graecum* grown in Khoram Abad showed the highest mucilage (20.31%), protein (22.57 %) and oil content (14.87 %) percentage than other. Following by Kermanshah, Shahr Rey, Urmia and Zanjan respectively. As well as, the plants were grown in Khoram Abad and Urmia areas showed the highest and lowest radical scavenging activity relative to others respectively.

Key words: *Trigonella foenum graecum*, Protein, Mucilage, antioxidant activity

Assessment the effect of high loading fertilization on chemical quality of under cultivated soils in intensive cultivation systems of Western Iran

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Abstract: Heavy metals (HMs) are the main pollutants in the environment. Over many years, high loadings of chemical fertilizers in intensive crop productions in Iran leads to environmental risks and ecological wastage. For better and accurate fertilizer recommendation, it is necessary to investigation of HMs sorption in soils. The objective of this research was to assess the heavy metals (Cd, Cu, Mn, Ni, Pb and Zn) accumulation in different greenhouse soils at surface depths (0-30 cm) of Western Iran. The results indicated the concentration and availability of heavy metals in studied soils were increased due to inputs as impurities from different fertilizers. Manganese, Pb and Cu are three main pollutant elements in greenhouse studied soils. Therefore, balanced fertilization plans and reductions in the concentrations of heavy metals in both fertilizers and manures must be commended to preserve a safe concentration of heavy metals in greenhouse soils.

Keywords: Greenhouse, Heavy metals, Soil Pollution, Intensive cultivation

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A comparison of some phytochemical characteristics of five types of *Lallemantia iberica* seeds from different parts of Azerbaijan region

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Abstract: *Lallemantia iberica* seeds has traditional uses as reconstitute, stimulant, diuretic and expectorant. The aim of this study was to determine the important phytochemical characteristics of *Lallemantia iberica* seeds collected from different parts of Azerbaijan region, Iran. Important characteristics of this plant including mucilage percentage, essential oil percentage, oil content, total phenol and flavonoid content and the radical scavenging activity. According to our results, the *Lallemantia iberica* grown in Bokan showed the highest mucilage (15.74%), essential oil (0.15%) and oil content (26.91%) percentage than other. Following by Varzaghan, Tekab, Zanjan and Marand respectively. As well as, the plants were grown in Tekab and Marand areas showed the highest and lowest radical scavenging activity relative to others respectively.

Keywords: Essential oil, Total phenol and flavonoid, Radical scavenging activity, *Lallemantia iberica*

Phytochemical Screening and Antipyretic Activity of Selected Plants Indigenous to Rawalakot AJK

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Abstract: Pyrexia is basis as a secondary force of infectivity, malignant cells or other disease condition. Majority of the antipyretic drugs are synthetic in nature which exert side effects such as gastric ulcer, hepatic necrosis and renal damage. The antipyretic potential of the hydro-alcoholic extracts of *Achillea millefolium*, *Taraxacum officinale*, *Salix alba* Linn and *Trigonella foenum* were investigated on the yeast induced pyrexia in albino rats. Paracetamol was used as a positive control. Rectal temperature of albino rats was verified immediately before the administration of the extracts or vehicle or paracetamol and yet again at 1 hour gap for 6 hours using digital thermometer. The animals having pyrexia were divided into four groups Group 1: Paracetamol was given to positive control. Group 2: Distilled water was given to negative control. Group 3: (250mg/kg) extract of plant was given to rats (treatment group 1). Group 4: (500mg/kg) extracts of plant was given to albino rats (Treatment group 2). The extracts were also phytochemically screened for alkaloids, tannins, saponins, flavonoids, cardiac glycosides and phenols. The hydro-alcoholic extracts of plants with the dose of 500mg/kg showed significant ($p < 0.0001$) decrease in yeast-induced pyrexia, as compared with that of set drug paracetamol (150mg/kg) where the extract dose 250 mg/kg was less effective than that of standard drug ($p < 0.05$). Phytochemical screening showed the presence of alkaloids, tannins, flavonoids, saponins and phenols. This study showed that hydro-alcoholic extracts of all plants under study at dose of 500 mg/kg have significant antipyretic potential in yeast-induced elevated temperature

Keywords: Antipyretic activity, Plant, Phytochemical screening, *Achillea millefolium*, *Taraxacum officinale*, *Salix alba* Linn., *Trigonella foenum*

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A comparative study on the effect of Zinc Oxide Nanoparticles on germination characteristics of seedlings and some morphological features of two cultivars; Iranian Parsley, *Petroselinum sativum* and Turkish Parsley, *Petroselinum crispum*.

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Abstract: Parsley consists of three major varieties such as common Parsley with curly leaves (*Petroselinum hortense*), flat leaf Parsley (*Petroselinum neapolitanum*), and fern leaves Parsley with tuberous root (*Petroselinum tuberosum*). Iranian Parsley is the common variety; *Petroselinum sativum* var. *hortense*; which has been less investigated under the stress by scientists recently. Auxin is a kind of the growth hormone for plant growth. The Zinc Oxide Nano Particles synthesize the Tryptophan Amino Acid while being a precursor for Auxin production, is considered as a stress factor. Afterward the Seeds of (*P. crispum* Line. Var. *hortens*) and (*P. sativum* Hoffm. Var. *hortens*) are selected as Turkish and Iranian Parsley alternatively. The statistical population for each *P. sativum* and *P. crispum* species was selected 100 seeds. The Seeds were treated under treatment 0 (as control group), 3mM, 6mM and 12mM of ZnO Nano Particles in two repeats for each species. By using numerical data daily from plates under different concentrations of ZnO (n), comparative study was carried out on SPSS statistical graphs. Results showed that treatments in 3mM and 6mM have highly positive significant difference in the rate and percentage of germination than control. Also the morphological difference in treated seedlings has seen include of longer root and faster growing up than control, much extended lamina of their leaves, while the treatments in 12mM showed the negative significant difference. These negative difference consist low rate of treatments germination, short roots than control and sometimes it looked like the adventitious roots. Also in the treated seedlings in 12mM, the lamina of leaves was smaller than control. These treated seedlings in 12mM were not able to exist more than two to three days and their leaves were going to weaken, necrosis and finally led to cut down. According to these results the optimum concentration of ZnO (n) has seen 0mM to 6mM. In this rank of ZnO (n) concentration, it can act as growth hormone for plants so the seedlings have been growing up in optimum rate and situation. Therefore by providing the Exogenous Auxin to transport in seedlings or seeds, it can be showed the optimum in plant growth and yield.

Keywords: Zinc Oxide Nanoparticle, Auxin, Growth hormone, *Petroselinum crispum*, *Petroselinum sativum*, Parsley

Kuraklık Stresinin *Brassica Oleracea* Bağışıklığı Üzerine Etkileri

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Özet: Brassicaceae (Turpgiller) ailesi, dünya genelinde yetişen başlıca tarım ve bahçe bitkilerinin birçok ürün çeşidini içerir. Üretimleri bitki hastalıkları, kuraklık ve olumsuz sıcaklıklar gibi abiyotik stresler nedeniyle tehdit altındadır ve bu durum çiftçilerin önemli kayıplarına neden olmaktadır. Son zamanlarda yapılan çalışmalar, biyotik ve abiyotik stresler için sinyal mekanizmaları arasındaki örtüşmeyi göz önüne sermiştir (Nejat ve Mantri, 2017). Bu çalışma, *Brassica oleracea* turunun, bağışıklık sistemi ve stres mekanizmalarına ait sinyal yolları bileşenlerinin düzenlenmesinde gerçekleşen çakışma üzerine bilgimizi geliştirmeyi amaçlamaktadır.

Bitkilerde ilk aktif savunma katmanı, patojen (veya mikrop) ile ilişkili moleküler yapılar (PAMP / MAMP) ile tetiklenen bağışıklık (PTI) sistemidir ve mikroplarda bulunan bu korunmuş moleküllerin algılanmasına dayanmaktadır. Birçok çalışma, PTI'nin bitkilerdeki hastalıkların potansiyel olarak kalıcı kontrolünü sağlayan kantitatif hastalık direncine (QDR) katkıda bulunduğunu göstermektedir (Poland ve diğ., 2009). Bununla

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birlikte, PTI ayrıca bitki büyümesiyle de bağlantılıdır ve abiyotik streslerden etkilenir (Lozano-Duran ve Zipfel, 2015).

Bu çalışma, *B. oleracea*'da kuraklık stresinin PTI ve QDR üzerindeki etkisinin araştırılmasına odaklanmıştır. Kuraklık stresine bağlı PTI indüksiyonu, *B. oleracea* ssp *alboglabra* (A12DHD) ve *B. oleracea* ssp *italica* (Green Duke GDDH33) haritalama popülasyonunda reaktif oksijen türlerinin (ROS) üretiminin ölçülmesiyle belirlenmiştir. Bu tespit, A12xGreenDuke popülasyonunun, kuraklık stresi uygulanmış ve stressiz kontrol bitkileri üzerinde yapılan çeşitli PAMP molekülleri uygulanarak ölçülmüş olan ROS üretim değerlerinin karşılaştırılmasıyla elde edilmiştir. Ayrıca, haritalama sonuçları, popülasyonda, kuraklık stresine bağlı ROS üretimindeki indüksiyonun ve *Botrytis cinerea*'ya direnç fenotipi için transgressif segregasyon olduğunu ortaya koydu. Bu çalışma, kuraklık stresinin bağışıklık üzerindeki etkileriyle ilgili yeni bilgiler sağlayacak böylece daha güvenilir ve kalıcı dirençli bitkilerin geliştirilmesini sağlayacaktır.

Anahtar Kelimeler: *Brassica oleracea*, Kuraklık, Reaktif Oksijen Türleri (ROS), PAMP ile Tetiklenen Bağışıklık (PTI), Kantitatif Hastalık Direnci (QDR)

Determination of Antioxidant and Oxidant Potentials of *Thymbra spicata* Collected from Duhok-Iraq

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Abstract: Plants are natural resources containing compounds with many different biological effects. Due to its bioactive compounds, it has many pharmacological effects. Nowadays, due to the increase in the side effects of synthetic drugs and the decrease in the effect levels, the trend towards alternative medicine has increased. In this study, total antioxidant status (TAS), total oxidant status (TOS) and oxidative stress index (OSI) of *Thymbra spicata* L. collected from Duhok (Iraq) region were determined. In this context, ethanol extract of the plant was obtained by using soxhlet apparatus. Then, TAS, TOS and OSI values were determined by using Rel Assay Kits. As a result of the studies, TAS value of the plant was determined 8.399 ± 0.102 , TOS value was 6.530 ± 0.115 and OSI value was 0.078 ± 0.001 . As a result, *T. spicata* used in our study was found to have high antioxidant activity. In addition, oxidant levels were found to be at normal levels. In this context, the plant is thought to be a powerful natural antioxidant source.

Keywords: Antioxidant, Oxidant, Oxidative stress, *Thymbra spicata*

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Determination of Antioxidant and Heavy Metals Contents of Wild Edible Mushroom *Ramaria stricta*

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Abstract: The use of mushrooms has been used in many civilizations for different purposes from past to present. Mushroom are used for food or medicinal purposes. The aim of this study was to determine the antioxidant and heavy metal contents of edible mushrooms, *Ramaria stricta* (Pers.) Quél. The ethanol (EtOH) extract of the mushroom was extracted using soxhlet apparatus. Total antioxidant status (TAS), total oxidant status (TOS) and oxidative stress index (OSI) of the extracts were determined using Rel Assay kits. Fe, Zn, Cu, Pb and Ni contents were determined by atomic absorption spectrometry. As a result of your studies, the TAS value of the mushroom was determined 4.223 ± 0.054 mmol/L, the TOS value was 8.201 ± 0.095 μ mol/L and the OSI value was 0.194 ± 0.001 . Fe content of mushroom samples were determined 451.21 ± 5.56 , Zn content was 39.19 ± 1.07 , Cu content was 95.54 ± 2.06 , Pb content was 2.18 ± 0.10 and Ni content was 7.17 ± 0.32 . In this study, the antioxidant potential of *R. stricta* mushroom used in our study was determined to be high. In addition, element contents were found to be at normal levels. As a result, *R. stricta* mushroom is thought to be a natural antioxidant source.

Keywords: Antioxidant, Oxidant, Edible mushroom, *Ramaria stricta*

(*Rosmarinus officinalis* L), cultivated in Azerbaijan

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Statement of the problem. Spicy aromatic plants are widely used in Azerbaijan. Among them, rosemary (*Rosmarinus officinalis* L), which is widely cultivated in Azerbaijan, is very popular. It is used in medicine, cosmetics and also as a food plant, which gives a special taste to food and is a natural food preservative. The substance that gives this plant its aroma and antibacterial properties is essential oil. This work is done with the purpose of studying of the composition of the essential oil isolated from rosemary, cultivated in the territory of Institute of Dendrology NAS of Azerbaijan.

Methodology and Theoretical Orientation. In the conditions of the culture, this plant is perennial well-developing evergreen herb with pleasant smell, reaching two meters in height and grows in one place for up to 10 years. The raw materials (aerial parts) for this research were collected in the blooming period on September 2019. The essential oil was prepared by hydro distillation and was analyzed by a combination of GC an-MS (Agilent Technologies 7890B Network CG System, 5977A inert Mass Selective Detector, cap column(30 m X 0,25 mm i.d.), oven temperature was 60-250 °C at rate of 3°/min, with carrier gas velocity (He) 1.0 mm / min).

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The components of the oil were identified by comparison of their mass spectra with those of a computer library or with authentic compounds and confirmed by comparison their retention indices, either with those of authentic compounds or with data published in the literature.

Conclusion and Significance. The oil isolated from aerial parts of rosemary was found to colorless liquid, pleasant smelling, obtained in yield of 2 % (w/w) calculated on dry weight. 54 compounds were identified in the oil. The major components were found to be 1R- α -Pinene(14,4 %), endo-Borneol(9, 1%), D-Limonene(6,5 %), D-Limonene(6,5%), Camphene(5,6%)*.

Therefore, we can conclude that the essential oil isolated from rosemary meets the requirements of current pharmacopeias. The local raw materials of rosemary, successfully cultivated in Azerbaijan, may be well used for the production of various medicines, food and cosmetics. Our data on the chemical composition of essential oils can be used in the design of analytical documentation for raw materials.

*in the brackets are peak areas of the indicated ingredients at the corresponding retention indices