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BOOK OF ABSTRACTS

23 OCTOBER 2021





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BIOPEPTIDES: SOURCES, PRODUCTION, AND BIOACTIVE PROPERTIES

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Abstract:

Biopeptides are protein fractions that exhibit various health benefits and functional properties. Some of these health benefits are anticancer, antithrombotic, immunomodulatory, and hypocholesterolemic activity. Bioactive peptides with these possible health benefits can be used in the production of functional foods and nutraceuticals. These peptides are inactive in the basic protein molecule sequence. However, through hydrolysis process these peptides can display biological activity. Bioactive peptides can be obtained from animal and plant sources including meat, egg, milk, cheese products, and soybean. They can be produced by enzymatic hydrolysis, chemical synthesis and microbial fermentation. In this review, antimicrobial, antioxidant, anticancer, mineral binder, antithrombotic, immunomodulatory, antiobesity, opioid effect, and cholesterol lowering properties of bioactive peptides were examined. Furthermore, potential impact of biopeptides on food safety and quality as well as difficulties in the biopeptide research were discussed.

Keywords: Bioactive peptides, enzymatic hydrolysis, health benefits, anticancer, antioxidant

CONVERTING A HIGHLY ACCURATE, PRE-DEFINED HRM PROTOCOL TO CAPS ASSAYS FOR SELECTING TVR1 RESISTANCE ALLELE IN LETTUCE

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Abstract:

Cultivated lettuce (*Lactuca saliva* L.) ($2n = 2x = 18$) is affected by the dieback disease caused by two viral pathogens, tomato bushy stunt virus (TBSV) and lettuce necrotic stunt virus (LNSV). The disease is soilborne and requires no vector to infect lettuce. Yet, genetic resistance to dieback is present and durable resistance is conferred by a single dominant gene, Tvr1. The gene was fine mapped, source of resistance was narrowed down to a small genomic region with two SNPs (single nucleotide polymorphisms) 18 bp apart from each other and a HRM (high-resolution melting) assay was developed by Simko et al. (2009), which accurately selects dieback resistance based on haplotype analysis of the locus. HRM is a powerful genomic analysis technique adapted to marker assisted selection. Yet, special equipment is required to perform the analysis and expertise is necessary to obtain reliable and reproducible results. In the present work, the HRM protocol developed by Simko et al. (2009) was converted to CAPS (cleaved amplified polymorphic sequence) assays. CAPS is a highly advantageous genotyping strategy, which suits well to laboratories with only basic molecular biology equipment. More importantly, CAPS assays are highly reproducible, since the technique relies on the highly precise restriction digestion process, which only occurs on certain alleles recognized by the endonuclease. In the present study, two SNPs that define the dieback resistance phenotype were examined for designing CAPS assays. Primers that flank the target SNPs were designed and restriction maps of the flanked sequences were analyzed based on allele combinations. As a result, two distinct CAPS assays were designed that genotype the two SNPs that cosegregate with Tvr1. These assays would be beneficial, practical genomic tools to be adopted by lettuce breeding programs.

Keywords: SNP, dieback resistance, viral pathogen, MAS

COVID 19 EPIDEMIC AND EFFECT OF LIVESTOCK SECTOR IN TURKEY

MUSTAFA VAROL, SAİD BİLGİNTURAN, SİBEL ALAPALA DEMİRHAN

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Abstract:

The covid-19 outbreak has revealed the importance of the food and livestock industry. Continuation of production in the livestock sector prevented the possible food crisis. The Covid-19 outbreak has had some effects on livestock in our country. And there has been an increase in costs along with global markets. However, production has not decreased. On the contrary, it increased. Covid-19 in the epidemic process in Turkey has undergone crop and animal production cuts. Therefore, there was no serious food problem.

Keywords: COVID-19, Turkey, Livestock Sector, Effect

**DETERMINATION OF EFFECTS DIFFERENT LOW DOSE GAMMA (60Co) RAYS IN
FRESH BEAN CULTIVARS UNDER WATER DEFICIT CONDITIONS**

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Abstract:

It was aimed to determine the effects of gamma rays (25, 50 and 100 Gy) in Gina and Romano cultivars under restricted irrigation conditions. Control (100%) and 50% water deficit were subjected to the seedlings grown in the climate room conditions at 23 ± 2 °C temperature and 16:8 light:dark period. At the end of the study, seedling growth parameters such as shoot length and diameter, number of leaves, shoot and root fresh-dry weights, root-shoot ratio of were measured. Also leaf rational water content (LRWC), photosynthetic pigment content, lipid peroxidation (Malondialdehyde (MDA)), membrane damage and index, and nutrient content in shoot were examined. Gamma irradiation applications increased approximately 49% in shoot length in Gina cultivar, and increased by 13% and 6.5%, respectively, in 25 and 50 Gy stress conditions compared to non-irradiated plants. It was observed that root length decreased in water deficit with increasing radiation dose, especially in Romano cultivar, but increased by 88% in Gina variety. It was found that lipid peroxidation decreased by 7.7-32.5% in both cultivars. It was determined that 100 Gy radiation doses were more prominent in morphological features and 50 Gy in physiological features and nutrient intake. and 50 Gy gamma rays were found to be more effective in both Gina and Romano cultivars.

Acknowledgement: This study was funded by the Project FYL-2019-7968 of Scientific Research Projects Council of Van Yuzuncu Yil University.

Keywords: Early seedling development, Fres bean, Gamma ray, Water deficit

HEALTH BENEFITS OF PROBIOTICS AND PROBIOTICS IN FOODS

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Abstract:

The term probiotic is a Greek word meaning “for life”. Probiotics when consumed in adequate amounts can provide health benefits to the host. Some of these health benefits are improving the intestinal biota and maintaining balance, reducing lactose intolerance, lowering serum cholesterol levels, and supporting immune system. Health benefits of probiotics lead to many studies in food science for the development of functional foods, and in health sciences for development of drugs and nutraceuticals. In this review, the characteristics of probiotic bacteria (Bacillus, Lactobacillus, Streptococcus and Bifidobacterium), health benefits of probiotics, and use of probiotics in food industry were discussed.

Keywords: Lactobacillus, Bifidobacterium, lactose intolerance, irritable bowel syndrome, food preservation

**IDENTIFICATION OF CANDIDATE RESISTANCE GENE ORTHOLOGS IN CARROT
(*Daucus carota* L.) THROUGH BIOINFORMATIC ANALYSES**

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Abstract:

Carrot (*Daucus carota* L.) ($2n = 2x = 18$) is one of the ten most commonly cultivated vegetable crops and, therefore, the most important member of the *Apiaceae* family. During the last decades, carrot production has increased significantly with an increased utilization of carrot as raw material for the production of juices and natural pigments. Development of novel carrot cultivars adapted to warmer climates also has contributed to the dramatic increase in carrot production rates. The present work focused on the identification of putative carrot disease resistance (R) genes through bioinformatics. Accordingly, bioinformatic analyses were performed in order to identify and locate putative R genes through a combined approach of domain prediction and homology analysis. Disease Resistance Analysis and Gene Orthology (DRAGO 2) software was first used to predict resistance genes in the total transcriptome of *D. carota*, which comprised 32,109 cDNA sequences. The analysis predicted six classes of R gene domains, in a total of 1644 unique cDNA sequences. These sequences are coded by anticipated R genes based on their structural features. The domains identified in the cDNA set were TM (transmembrane domain), kinase, CC (coiled coil), NBS (nucleotide binding), LRR (leucine rich repeat) and TIR (Toll-interleukin receptor). Following the ab initio R gene prediction, the analysis was refined to a homology search against the set of experimentally validated plant R genes (153 R genes). As a result, 935 unique cDNA sequences were identified with a high degree of homology (E-value threshold: $1E-10$) with the reference set of 153 R genes. The cDNA was orthologous to 60 distinct reference R genes. The set of genic sequences identified in the present work constitute a basis for further work toward cloning carrot resistance genes and defining functional disease resistance markers through targeted high-throughput sequencing.

Keywords: genomics; gene prediction; domain prediction

IDENTIFICATION OF SOME QUALITATIVE TOMATO GENOTYPES BY MORPHOLOGICAL AND MOLECULAR METHODS

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Abstract:

In this study, S2 grade tomato (*Lycopersicon lycopersicum*) genotypes, which were determined to be promising in previous studies, were characterized by morphological and molecular methods. In this context, morphological observations were made on 240 genotypes in the S2 level. In these observations, 335 genotypes of tomato morphological and observations were carried out in the S3 level with my plant. In addition, with the appropriate 93 genotype SSR method here, Meloidgyne incognita, Tomato Mosaic Virus (ToMV), yellow leaf curl virus (TYLCV) Verticillium dahliae, Fusarium oxysporum f. sp. It is resistant and regulated to Lycopers Tomato Spotted Wilt Virus (TSWV).

In accordance with the purpose, using UPOV in terms of morphology; growth type, flowering time, number of flowers in cluster, inflorescence at first node, leaf growth, leaf length, leaf length, leaf blade, structure transverse and longitudinal section, fruit pericarp thickness, number of fruit places, fruit green maturity, fruit maturity time, ripe SÇKM in fruit, fruit color and observations were made. With the obtained data, principal components were analyzed at S2 and S3 levels, and 5 principal component axes were obtained at S2 levels. These axes represented 67,69% of the total variation, the eigen values of these first 5 basic components were found between 1.00-2.65 and scoreplot and loadingplotgraphs were created. In the S3 level, 4 principal component axes independent of each other were obtained, and these axes represented 63.19% of the total variation. Molecular diversity among tomato genotypes was determined by SSR marker. In molecular studies, it was determined for tomato genotypes. 14 pairs of EST-SSR primers were used. A total of 137 DNA alleles were made in the tomato genotypes used in the study. SSR markers are scored as yes/no (1/0) and the data file can be made on the DARwin website. In the study, NJ dendrogram showing the molecular genetic relationships between tomato genotypes, it was determined that the genotypes were divided into four main branches and gathered in six groups. The correlation between Mantel test result and distance matrix and NJ dendrogram was revealed ($r=0.91$). In addition, 93 S3 grade tomato genotypes have 22 genotype RR to Meloidgyne incognita, 19 RR to Tomato Mosaic Virus, 16 RR to Verticillium dahliae, 4

Keywords: tomato, morphological analyses, molecular analyses

**INOCULATION WITH PLANT GROWTH-PROMOTING BACTERIA FOR
IMPROVING NODULATION, NITROGEN UPTAKE AND GROWTH OF PEANUT
(*Arachis hypogaea* L.)**

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Abstract:

The relationships between multi-traits beneficial bacteria and their inoculations and *Arachis hypogaea* L. have been poorly explored despite their dominate in the peanut's rhizosphere and support plant growth, yield, nutrient uptake, and soil fertility. Inoculation with multi-traits beneficial bacteria promotes plant growth, yield and nutrient uptake. The present study assessed possible effects of mineral fertilizer (NPK), two commercial liquid bio-fertilizer and IAA-producing, ACC deaminase-containing, N₂-fixing, and P-solubilizing bacteria based bio-fertilizers in single (*Pseudomonas fluorescens* RC512, *Bacillus subtilis* RC210, *Bacillus megaterium* RC16), dual (RC210+RC16, RC512+RC210, RC512+RC16) and triple strains combinations (RC512+RC210+RC16) on nodulation and growth parameters of peanut. Inoculations of peanut with RC512, RC210, RC16, RC210+RC16, RC512+RC210, RC512+RC16, and RC512+RC210+RC16 gave increases over control respectively of by 10.9, 11.4, 5.3, 7.4, 14.6, 7.2, and 21.9 % in dry weight of root, by 7.8, 3.0, 4.0, 9.5, 15.5, 9.0, and 23.6 % in dry weight of shoot, by 21.9, 10.1, 13.6, 20.4, 27.5, 20.0, and 28.7 % in number of nodules per plants, by 16.1, 8.6, 7.3, 13.8, 25.7, 8.6, and 27.9% in weight of nodules and by 18.3, 11.0, 8.8, 13.6, 16.4, 18.2, and 24.3 % in N content of shoot per plants. NPK applications, however, increased dry weight of root up to 20.3%, dry weight of shoot by 27.1 %, number of nodules by 23.6%, weight of nodules per plants by 26.1% and N content of shoot by 26.2%. In general, triple inoculations performed better than uninoculated control, single and dual inoculations in terms of growth and nodulation parameters.

Keywords: Groundnut, root-colonizing bacteria, nitrogen fixation, nitrogen accumulation, nodules number and weight, root and shoot weight

INVESTIGATION OF PROPAGATION POSSIBILITIES OF *Thymus praecox* (ANZER THYME) WITH TISSUE CULTURE

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Abstract:

Anzer Thyme (*Thymus praecox* Opiz subsp. *caucasicus* var. *caucasicus*) is name after the Anzer plateau in Rize, Turkey, which is located in the East Black Sea region. It is a member of the genus *Thymus* (Lamiaceae family), which has 41 species in Turkey, 24 of which are endemic. Anzer tea is made from fresh and dried *Thymus praecox* Opiz subsp. *caucasicus* var. *caucasicus* leaves. It is also used as a traditional medicine to cure stomach aches, headaches, influenza, cough, and excessive cholesterol. In this study, plant propagation of *Thymus praecox* Opiz subsp. *caucasicus* var. *caucasicus* (Anzer Thyme) in tissue culture conditions was investigated. In order to induce plant regeneration 1 mg/L Kinetin and 1 mg/L Kinetin + 0,1 mg/L NAA were tested on leaf, stem and root explants. MS medium without any plant growth regulators was preferred as control group. All explants were cultured in two different incubation conditions respectively as; 16 hours light and 8 hours dark conditions at 26°C, 3000 lux light source in growth chamber and dark condition at 26°C. According to the results, the highest plant regeneration rates were found in 1 mg/L Kinetin + 0,1 mg/L NAA medium with root, stem and leaf explants respectively as 51,3%, 40% and 27,5%. The lowest plant regeneration rate was found as 5,6% in leaf explants in control medium. As a result, only 1 mg/L Kinetin treatments were efficient in inducing plant regeneration (35,7% in stem, 25,7% in root and 18,8% in leaf explants) but when combined with 0,1.

Keywords: *Thymus praecox*, Anzer Tea, Tissue Culture, Kinetin, Naphthaleneacetic acid

INVESTIGATION OF THE VOLATILE OIL COMPONENTS OF *Salvia glutinosa*

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Abstract:

There are about 900 species of sage (*Salvia* spp.) in the world. These species are mostly distributed in the Americas and South-West Asia continents. There are 97 *Salvia* species in Turkey, and 51 of these species are endemic and show a high rate of endemism. Many *Salvia* species exhibit some medicinal effects such as antispasmodic, antibacterial, antifungal and antioxidant activity. Moreover, many of *Salvia* species are used to flavor food as well as in cosmetics, perfumes and other pharmaceutical industries. *Salvia glutinosa* L. naturally grows in moist locations in deciduous forest and scrub and in *Picea* forests of south and south Anatolia and the flowering time is from July to October. In this study, the volatile components of the *Salvia glutinosa* (L.) plants were investigated which collected from the Çat (1295 m) plateau of Rize at the time of flowering. The proportion of volatile oils of the plant harvested during the full flowering period both in the nature and cultivated. Aromatic components in the volatile oil of the plant were determined using the SPME (Solid Phase Microextraction) method in a Gas Chromatography (GC-MS) device. Almost 28 different components were found as a result of the analysis, while made up a significant part of the featured components. The significant part of the prominent volatile compounds in the plant samples collected from the nature was found as respectively Germacrene-D (%15.87), Neomenthyl acetate(%8.2), Neodene (%7.82), Isoborneol (%7.54), α -Himachalene (%7.23), Isovaleric acid (%6.36) and Carvacrol (%5.39) while volatile compounds of the plant samples

Keywords: *Salvia glutinosa*, Aromatic Compounds, Germacrene-D, Aromadendrene, GC-MS

**MORPHOLOGICAL CHARACTERIZATION OF SOME QUALIFIED MELON
GENOTYPE AND HETEROTIC GROUPS**

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Abstract:

The aim of the study is to determine the morphological characteristics of some qualified melon genotypes and to establish heterotic groups. In the study, 56 S2 grade melon genotypes were used. The research was carried out in the research and application plots of the Department of Vegetable Growing and Breeding, Department of Horticulture, Faculty of Agriculture, Selcuk University. Average fruit weight (MA), fruit length (MU), fruit diameter (MÇ), fruit stem length (MSU), fruit stem thickness (MSK), fruit seal size (MMB), fruit flesh thickness (MEK), the skin of the genotypes. thickness (CC), SSKM and pH in the fruit and 1000 seed weight (TA), number of seeds per fruit (TS) 2663.14 ± 762.14 gr, 20.21 ± 2.94 cm, 17.29 ± 1.86 cm, 34.67 ± 8.22 mm, 6.60 ± 2.50 mm, respectively, It was found as 2.63 ± 1.16 cm, 33.95 ± 5.59 mm, 4.73 ± 1.99 mm, $7.74 \pm 1.35\%$, 6.15 ± 0.30 , 45.47 ± 6.66 g and 902.76 ± 207.90 . As a result of Principal Component Analysis (PCA), 4 independent principal component axes (TBA1, TBA2, TBA3, and TBA4) were obtained regarding the 12 identification features examined. Among TBA1, TBA2, TBA3 and TBA4, MA, MU, MÇ, MEK, and TA, respectively; MSK, MMB, KK, SÇKM, and TS; It has been determined that MSK and KK and MU and MMB characteristics form close groups. The Eigenvalues of the first 4 basic components varied between 1.2827 and 3.8940. The variations explained by the 1st, 2nd, 3rd, and 4th principal components were determined as 32.450%, 16.604%, 11.525%, and 10.690, respectively. As a result, it was determined that 56 melon genotypes formed 4 different clusters.

Keywords: Melon, Morphological characteristics, Heterotic groups, Cluster

**SELECTIVE DEFOLIATION BY SHEEP ACCORDING TO HERBAGE MASS AND
PLANT SPECIES IN A NATURAL DEGRADED PASTURE**

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Abstract:

The objective of the study was to evaluate the grazing behaviour by sheep in naturalised degraded pastures in south of Chile which had received three years of fertilisers and intensive sheep grazing. There were two treatments: non-fertilised pasture (NFP) and naturalised fertilised pastures (FP). Pasture herbage mass and selective grazing were evaluated within three randomised blocks. Pasture herbage mass was assessed using the rising plate method with a calibrated equation: $y=174,76x + 232,04$ ($R^2 0.8$). The trim technique was used with a 0.1 m² quadrat and cutting the pasture to a soil level. Three fixed transects of 15 m long were placed in each plot. Along each transect, every 0.75 m an individual tiller of *L. perenne*, *B. valdivianus*, and a plant of *L. nudicaulis* was marked using a coloured paperclip, which was attached to the soil by an eight cm nail. A total of 7 individual marked tillers or plants for each species were marked in each transect. Pre and post grazing, the nails were found using a metal detector allowing the identification of each tiller/plant marked. The highest herbage mass was during Spring in FP and the lowest in Summer and Winter in NFP. In FP, the grazing probability of *L. perenne* and *B. valdivianus* increased in Autumn and Spring, when both species had longer lamina, while in Summer, *L. nudicaulis* was the most selected specie. In NFP, the sheep selected *L. nudicaulis* over the grass species in all seasons. These results show that sheep do actively select species to be grazed when the species increases its availability in the pasture. Selective grazing changed through the year according to pasture herbage mass.

Keywords: dry matter, grazing probability, pasture improvement, intensive grazing

SOMALI AGRICULTURAL AND LIVESTOCK NOMADIC PRODUCTION

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Abstract:

Somalia is located in the horn of Africa, the landmass of Somalia is dominated by arid and semi-arid rangelands for which pastoralism is the most appropriate form of land use. Livestock not only constitutes the main livelihood of the pastoralists, but also represents the main component of the gross domestic product of the economy of the country. In Somalia at present, only pastoralists and agro-pastoralists are practising for that reason all basic livestock data are remaining in the hands of Nomads and agro-pastoralists. Despite the conflict and instability that has been witnessed in Somalia over the past two decades caused the collapse and destruction of livestock institutions, but the livestock sector has continued to be the main economic activity. Somali livestock experts have passed a long period in which they have remained far from the sector, which caused a lack of modern technology and research institutions. This makes the situation more complex in order to find the actual data of the livestock sector. Animals are all dependent on rangeland resources by utilizing a free-grazing system. As with most pastoral areas, it is affected by environmental changes and rangeland degradation, mainly due to increased population pressure, overstocking, no grazing management plans (overgrazing) and vegetation removal for fuelwood (deforestation), and no apparent authority of rangeland ownership. In terms of maintaining livestock production, research needs to increase. The establishment of animal marketing, veterinary services and drought mitigation strategies is essential. The introduction of a zero-grazing system gives a chance to restore degraded pastures and reduce excessive pressure on fewer plants.

Keywords: Somali, Rengland, Livestock, Pastoralism

THE EFFECT OF BIOCHAR APPLICATION ON SOME PHYSICAL PROPERTIES OF PEPPER (*Capsicum annuum* L.) IN DEFICIT IRRIGATION CONDITIONS

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Abstract:

In this study, the effect of biochar, obtained from pruning waste of rose plant, application under the deficit irrigation conditions was investigated over the height, plant diameter, fruit length and leaf color parameters of pepper plant (*Capsicum annuum* L. cv. Tonton F1). The experiment was conducted by applying three irrigation levels (I0; 100% full irrigation as control application, I1; 25% deficit irrigation, I2; 50% deficit irrigation) and four biochar doses (B0; 0%- of biochar as control application, B1; 0.75% of biochar, B2; 1.5% of biochar and B3; 3% of biochar as w/w) with three replicates in total of 36 pots as randomized plot design. The findings showed that, plant height, stem diameter and fruit length were significantly decreased in deficit irrigation ($p<0.01$). While plant height and stem diameter were significantly increased in biochar application, the values of fruit diameter were not varied statistically. The highest plant height (44.67 cm), stem diameter (7.34 mm) and fruit length (14.1 cm) were determined in full irrigation treatment with 3% of biochar (B3-I0). The difference between applications in terms of leaf color parameters (L , a^* , b^* , C^* , h°) were significant ($p<0.01$) also. B0 treatment provided the highest L , a , b and C values considering treatment means, while the h° value was found the highest in B3. As a conclusion, it can be indicated that pepper plant development in the biochar-treated pots under deficit irrigation conditions can improved considerable levels compared to without biochar.

Keywords: Biochar, color parameters, deficit irrigation, pepper, plant growth

THE POPULATION CHANGES OF EUROPEAN GRAPEVINE MOTH, (*Lobesia botrana* Den. & Schiff.) IN VINEYARD IN ANTALYA

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Abstract:

European grapevine moth, (*Lobesia botrana* Den. & Schiff.) (Lep.: Tortricidae) is an economically important pest of vineyards in Turkey. Larvae cause to serious damages, by feeding on the flower buds and especially grape berries during the ripening period. Seasonal flight activity of *L. botrana* is crucial to determine spraying time. The experiments were conducted in 2014 and 2015 in Antalya. The number of *L. botrana* adult (male) was investigated by using pheromone traps and larval population was determined by counting the larvae on the grape clusters. The first adult was captured in traps at the end of March in both years. The highest number of adults was counted on July 7 (72.5 adults/trap) in 2014 and July 14 (54 adults/trap) in 2015. The pest showed four peaks in March, June, July and August. The results of this experiments also confirm the part of the pest population may develop in September in the region for fifth generation.

Keywords: Control, Grape, Population fluctuation, Sum of effective temperatures

**ULTRASOUND-ASSISTED ENZYMATIC EXTRACTION OF PROTEINS FROM RED
MACROALGAE *Gracilaria dura*: A PRELIMINARY STUDY**

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Abstract:

Macroalgae (seaweeds) are rich in valuable bioactive compounds such as high quality protein, dietary fiber, polysaccharides, polyunsaturated fatty acids, minerals, vitamins, pigments and polyphenols. In this study, it was aimed to optimize the extraction conditions for ultrasound-assisted enzymatic extraction of proteins from the red macroalgae *Gracilaria dura* by using response surface methodology (RSM). Ultrasound probe time (2-8 min), extraction time (1-3 h) and enzyme/substrate ratio (E/S, 0.40-1.60) were selected as the independent variables were selected. Protein content (PC) and total phenolic content (TPC) of the extracts were determined spectrophotometrically by Lowry method and Folin-Ciocalteu method, respectively. According to the results of the study, PC of the protein extracts varied between 3.36-64.38 mg/g dw and TPC ranged from 21.58 to 51.71 mg GAE /g dw. The effect of E/S ratio on the protein content of the extracts ($p= 0.0175$) and the interaction between ultrasound probe time and extraction time were found to be significant ($p= 0.0050$). The p value of the model for PC was 0.0265 and the R-squared value was 0.85. Based on the RSM analysis, PC and TPC values of the protein extracts obtained under optimum extraction conditions (ultrasound probe time: 2 min, E/S: 0.8 and extraction time: 1 h) were found to be 53.6 mg/g dw and 49.08 mg GAE/g dw, respectively. As a result, *Gracilaria dura* macroalgae as an alternative protein source can be thought to have an important potential for the food industry due to its high protein content and total phenolic content.

Keywords: *Gracilaria dura*, ultrasound-assisted extraction, protein, RSM, red macroalgae

PROPOSALS FOR GROUPING AND PASSPORTIZATION OF SOILS OF URBANIZED TERRITORIES LAND

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Abstract:

For a city planning cadastre, organization, planning and implementation of land management, economic activity, a scheme of supplementing the list of agricultural soils of Ukraine with cadastral and economic grouping of soils of urbanized territories is proposed, which includes two associations: 1) transformed and 2) technological (artificially created) soils – all in all 14 cadastral and economic groups. A new passport of soils of the land plot of the urbanized territory, which contains information on the quantitative and qualitative condition of soils at the time of the research has been declared. Issuance of a passport is the final stage of soil research (certification), which has legal force in the implementation of land management (removal and transfer of fertile soil layer), compensation, conducting a city planning cadastre, etc.

Keywords: Passportization, Urbanized territories land

**TESTING OF INSECTICIDES TO PROTECT GRAPES FROM JAPANESE GRAPE
CICADA (*Arboridia kakogowana* Mats.) IN UKRAINE**

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Abstract:

Recently, in the vineyards of Ukraine and other countries, both in industrial plantings and personal farms, an increase in the number of Japanese (Far Eastern) grape leafhoppers (*Arboridia kakogowana* Mats.) has been observed due to a number of reasons. First of all, these are climatic changes, characterized as a persistent thermal anomaly, the ability of the leafhopper for mass reproduction and its high ecological plasticity to changing environmental conditions.

To determine the effectiveness of preparations for controlling the number of Japanese grape cicada an experiment was laid, which included 9 variants. Six insecticides belonging to different chemical groups and one biological preparation were tested. Each variant included 20 plants, which corresponded to 4 replicates of 5 plants each. The obligatory variants were: control - vines without treatments and the standard (standard) - insecticide, which is used by the farm. Placement of variants is randomized, replicates are systematic. Spraying was carried out using STIHL SR 420 when nymphs of younger age groups appeared, depending on the economic threshold of harmfulness (EPV), which, according to, is more than 15 individuals.

Due to the annual damage to grapes by this cicada, plants are depleted, immunity and product quality are reduced. It was found that the highest number and, as a consequence, the harmfulness of leafhoppers is observed in the second half of the growing season (July-September) during the period of active growth and ripening of grapes. The greatest development of leafhoppers was recorded in thickened vineyards with the presence of vegetative weeds.). This insecticides have shown varying efficacy. The highest efficiency was obtained with the insecticides Voliam Flexy (300 g/l) SC – 89,3% and Engeo (247 g/l) SC – 86,3%, which contain two active substances with a different mechanism of actions. Very low efficiency in controlling the number of leafhoppers was obtained with the biological preparation Aktofit (0,2%) EC – 53,8%. According to the research results, we can conclude, that the most effective and basic method controlling the Japanese grape leafhopper remains the chemical. The decision about need of treatments should be made only after assessing the real phytosanitary situation, taking into account the threshold of the number of pests, harmfulness, and the degree of colonization of plants. With a low number of phytophages, continuous treatments should be abandoned, limiting themselves to spraying outbreaks of mass reproduction.

The greatest protective effect of controlling the number of Japanese grape leafhoppers is observed when using combined insecticides with active ingredients of different mechanisms of action – Voliam Flexi SC (thiamethoxam, 200 g/l + chloranthraniliprol, 100 g/l) with a consumption rate of 0,3 l/ha and Engeo SC (thiamethoxam, 141 g/l + lambda-cyhalothrin, 106 g/l) with a consumption rate of 0,18 l/ha, which combines a powerful knockdown effect with a long period of crop protection. The optimal period for making treatments is the period of development of the second and third generations of leafhoppers. If necessary, 2 treatments should be made with an interval of 12-14 days, during the period of active growth and the beginning of ripening of grapes. The processing period is the period of mass hatching of larvae.

Keywords: Japanese grape leafhopper, insecticides, biological effectiveness

GEOGRAPHIC INFORMATION SYSTEMS AS THE BASICS FOR AGRISHARING

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Abstract:

The study substantiates the need for joint development of higher education, science and agribusiness to ensure their harmonious development - "agrisharing" based on the Geographic Information System (GIS) platform. Problems of development the corresponding branches separately are defined. It is proved that their joint development in modern conditions of introduction the information and communication technologies is possible on condition of existence the platform which would combine as information on joint material, technical and intellectual resources, so give the chance of economic development and profit from such collaboration. Given the presence of the agricultural sector in this interaction and land as the basis of the relevant production, the use of geographic information system for researching purposes is determined by a single and optimal solution. "Agrisharing" is defined by the authors as the joint consumption of goods, natural resources, material and technical base and intellectual capital in the system of higher education, business and science interaction in the agricultural sector. The directions, functions, tasks and advantages of using the GIS platform in agrisharing system are given. Such systems for agricultural entrepreneurs, educational institutions and research institutions allow to develop the following areas: information support for decision-making; planning of agricultural operations; monitoring of agrotechnical operations and dynamics of land use; crop yield forecasting and loss estimation; planning, monitoring and analysis of the technology use, intellectual resources and scientific potential development; territorial distribution of the possibility of providing consulting services and educational facilities; optimization of joint resource usage.

Keywords: GIS platform, agrisharing, agricultural entrepreneurs, educational institutions, research institutions, joint development

**SUBSTANTIATION OF REQUIREMENTS FOR THE RESERVATION OF ELEMENTS
OF COMPLEX TECHNICAL SYSTEMS FOR HARVESTING GRAIN CROPS**

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Abstract:

An analysis of the reliability of complex technical systems for harvesting grain crops, taking into account their trouble-free operation, is presented. The model of functioning of harvesting machines and vehicles as a complex technical system, as a part of harvesting and transport complexes has been substantiated. A technique has been developed for the effective replacement of parts, components and assemblies of combines of technological complexes for harvesting grain crops.

Keywords: system, harvester, reliability, service, parts, units, assemblies, probability, modeling.

FARMS AS A FORM OF AGRARIAN ENTREPRENEURSHIP

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Abstract:

The article considers the development trends of Ukrainian farms from 2010 to 2020 period. The dynamics and structure of agricultural production are analyzed. The agricultural production efficiency level in farms as a form of agricultural entrepreneurship is studied. The modern farms problems have been identified. The level of farms state support is assessed and the directions of its improvement are determined. The aim is to substantiate the theoretical and methodological provisions and develop scientific and practical recommendations for the development of the marketing of innovative products. The object of research is the economic and social processes of farm development as a form of agricultural entrepreneurship. The subject of the study is a set of theoretical, methodological and applied aspects of farm development as a form of agricultural entrepreneurship in Ukraine. The necessity of system measures development for increasing farms efficiency functioning is substantiated.

Keywords: agricultural entrepreneurship

**ECONOMIC EFFICIENCY OF COMPLETE FEED PRODUCTION PROVIDED THE
USE OF PROTEIN AND VITAMIN SUPPLEMENTS FOR BROILER CHICKENS AGED
4-5 WEEKS 5 %**

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Abstract:

Feeding of young poultry was carried out with complete feed for broiler chickens aged 4-5 weeks.

The nutritional value of 1 kg of complete feed is 12.5 MJ of metabolic energy. 1 kg of compound feed contains: dry matter - 860 g, crude protein - within 220 g, lysine - not less than 13 g, methionine + cystine - 9, threonine - 9, tryptophan - 2.6, crude fat - 50, crude fiber - not more than 40, sodium - not more than 2, calcium - not less than 8 and phosphorus - 6 g.

Compound feed is balanced with the content of normalized microelements and vitamins, includes enzymes, antioxidant, adsorbent and prebiotic.

The basis of complete feed for broiler chickens aged 4-5 weeks are grain feed, plant protein concentrates, protein-vitamin supplement and soya oil.

The live weight of broiler chickens at 5 weeks of age is 2210 g, with an average daily gain for the period of 90 g. Feed costs for the period of feeding broiler chickens aged 4-5 weeks - 1.89 kg, feed conversion - 1.5 kg, the cost of 1 kg of live weight gain - 16 UAH.

It is concluded that the high economic efficiency of production of complete feed with the use of protein and vitamin supplements for broiler chickens aged 4-5 weeks 5 %.

It is established that the feeding of complete feed for broiler chickens aged 4-5 weeks satisfies the need of animals for energy, nutrients and biologically active substances, provides high productive qualities of poultry and meets the requirements of intensive management of the poultry industry.

Keywords: broiler chickens, economic efficiency

**FEATURES OF LAYING VINEYARDS IN PERSONAL FARMS IN THE SOUTH OF
UKRAINE**

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Abstract:

Viticulture is one of the branches of agricultural production, which despite a number of unfavorable economic factors of the country's development and structural changes in the process of reforming the agricultural sector has not lost its investment attractiveness and remains one of the promising areas of business for small and medium farms. Therefore, the peculiarities of the creation of vineyards with table varieties, as well as patterns of their growth and development in the south of Ukraine is a topical issue. As a result of research, the development of their vegetative mass (length, diameter of shoots and number of leaves), root system and seedling survival rate was analyzed.

Keywords: *grape, biometric indicators, weight of the bunch, leaf area, roots, harvest of bush*

**THE SEARCH FOR NANOSCALE AND DISINFECTANTS IN VETERINARY
MEDICINE**

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Abstract:

In the system of veterinary and sanitary measures, the search for new highly effective means for prevention, treatment and disinfection amid ecological changes in the environment remains relevant. Quality disinfection depends on the use of effective veterinary preparations. In a short time, they are to eliminate the pathogens of infectious diseases, which requires a special approach to the choice of methods (wet, aerosol, gas, foam) and means (chemical, biological, physical) of disinfection and techniques for their use. Effective disinfection requires appropriate preparations, but most of them do not meet certain requirements, namely: some of them have a high bactericidal effect, but are toxic, others – have a high effect, low toxicity, but destructive impact on the treated objects. On the basis of the obtained preliminary laboratory studies, we have established the bactericidal effect of the drug “Hermicid BC” and the possibility of its use for disinfection of animal husbandry facilities. No microorganisms were found on the plastic and tiles after treatment with a 1.0% solution of “Hermicid BC” after exposure for 15 minutes, that is, the drug worked 100% compared to the control. It was found that in the poultry house after using a 0.15% solution of “Hermicid BC” for an exposure of 40 minutes, the number of microorganisms decreased by almost 5 thousand times, and in the control boxes - by almost 10 times. No pathogenic microflora has been identified by bacteriological studies. Established the bactericidal effect of the drug “SEFDEZVET” on the test culture of enterobacteria - at 1:00 exposure and on the test culture of *St. aureus* - 4:00. Regarding Ag and Ag + Bi nanoparticles, their bactericidal action is prolonged and occurs only after 48 hours.

Keywords: disinfection, veterinary medicine, disinfectants, Ukrainian market

**MOVING UKRAINE ALONG GLOBAL VALUE NETWORKS: CASE OF
AGRICULTURE**

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Abstract:

The relevance of the subject is explained by the place Ukraine takes in World and regional production of agricultural products. It was shown that Ukraine suffers from the fact that it produced and exports mostly raw materials and semifinished products which hampers perspectives of further development of whole sector of Ukrainian economy. Additional tension is evoked by the European legislation requirements and respective obligations taken by Ukrainian government regarding standards applied to agricultural products and general tendencies towards globalization of production. Therefore, it was stated that Ukraine should simultaneously meet two goals – one is to develop main principles on how to manage agriculture production as to protect national interests, another one is to define the role of Ukraine as an operator at the international market for the sake of international and global interests and challenges. The goal of the paper was to assess which place is given to agriculture and to global value chains by international agreements which are of most interest for Ukraine. As a result of the research it was suggested for Ukraine developing cooperation in the field of agricultural production in the framework of creation or developing of regional value chains via using potential of already ratified regional agreements with specific SCO member states, such as: Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan to makes bridges with Balkans, Baltic countries, South Caucasus, South of Africa mimicking at some extent and complementing Belt and Road Initiative. It was recommended to promote the idea of extensive regionalization of GVN in front of Ukrainian western counterparties owing to the fact that the investment presence from western European countries (Germany, Netherlands, France etc.) remain substantial.

Keywords:

**THE LEVEL OF SOILS AND CROP PRODUCE POLLUTION WITH HEAVY METALS
AT THE ODESSA REGION**

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Abstract:

As the result of agroecological observation, the admission of Heavy Metals (HM) to soil, and their content in plants were analyzed. The estimation concerned X research tour, 2011-2020 years. MPL exceed of lead content in soil was detected, up to 6.4 times. Lead pollution higher than MPL was detected mainly in southern districts patterns, 170 of 186 analyzed. The cadmium pollution was detected in 59 samples. The viticulture districts patterns, from the south of Odessa region, were cooper-polluted exceeding MPL, generally 23 samples. The soils pollution raise is linked besides others, with mineral fertilizers application raise up to 1.56 times. During X tour 540 plants and grain samples were analyzed, 1196 analysis done, and 2 samples were identified as polluted by cooper and zinc. These samples were vegetables from Bylyaevka district. There was not detected relationship between the soil and plants pollution. The way to decrease the HM admission to soil and plants is first of all obligate utilization of secondary produce as an organic fertilizer, together with low amounts of mineral fertilizers.

Keywords: agrochemical pasportisation, heavy metals, soils pollution, crop pollution, fertilizers pollution.

**APPLIED ASPECTS OF ECONOMIC AND MATHEMATICAL MODELING OF
PRODUCTION ACTIVITY OF ENTERPRISES OF THE AGRICULTURAL SECTOR**

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Abstract:

The urgency of the problem of improving the management of production activities of enterprises in the agricultural sector is substantiated. The importance of using economic and mathematical methods in general and optimization models, in particular, in the process of ensuring the optimal correlation between crop production and animal husbandry in agricultural enterprises, in conditions of limited resources are highlighted. The economic-mathematical model of optimization of structure of production of agricultural production in the specific enterprise of agricultural sector with use of modern information technologies is developed. The purpose of this research is to generalize the theoretical and methodological principles and develop applied recommendations for the use of economic and mathematical methods in the process of modeling the structure of agricultural production in a particular agricultural enterprise. As a result of researches the optimum parameters of realization of production activity of the agrarian enterprise are justified on an example of PF "V.V. Plakushchenko" of Odessa region. The optimal structure of the sown area is found, which allows to provide the highest values of production volumes of the main types of agricultural products, in particular plant growing and animal husbandry. Labor costs and mineral fertilizers for the production of each type of product are calculated. The optimal value of the pig population is calculated and the fodder base for the development of this industry is formed. The main financial indicators of production activity of the enterprise are determined (the value of gross output, production and commercial cost, sales revenue and profit).

Keywords:

AGRICULTURAL EDUCATION OF SOUTHERN UKRAINE POLICY

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Abstract:

The article reveals the policy aspects of agricultural education establishment in Southern Ukraine. The contribution of leading scientists to the formation of agricultural schools has been studied.

This paper examines the stages of the agricultural education establishment in Southern Ukraine alongside the historical development of economic, social, cultural, and political life in the 19th – early 20th centuries due to reforms in the Russian Empire, including agricultural education. Our study focuses on the analysis of the agricultural education establishment in Southern Ukraine. The researched field includes materials of the archive of Odesa State Agrarian University; periodicals and electronic publications; narrative sources, in particular, the memoirs of professors of Odesa National University named after Ilya Mechnikov, Odesa Agricultural Institute, related with the agricultural education establishment in Southern Ukraine. The authors' attention focused on the history of content, forms, and methods of educational process in Odesa State Agrarian University and the agricultural education establishment in Southern Ukraine in the 19th – early 20th centuries, particularly the organizational materials of the agrarian education schools of the specified period are highlighted. The stages of the historical development of the agricultural education are clarified, historical changes in the content, forms, and methods of educational process in agricultural educational institutions in the 19th – early 20th centuries are revealed. A study of the development of the history of agricultural education in Ukraine in the 19th – early 20th centuries under the influence of changes in the socio-political, socio-economic, and cultural life of the Russian Empire, the Ukrainian Soviet Socialist Republic and modern Ukraine has been conducted. The development of the agricultural education system is illustrated. The authors trace the formation and development of agricultural education in general. The importance of the research results for use in the teaching of social sciences and humanities such as "History of Ukraine", "History of Ukrainian culture", "University Pedagogy" at Odesa State Agrarian University is proved.

Keywords:

METHODS AND TOOLS OF INNOVATIVE MARKETING

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Abstract:

The article highlights the relevance of scientifically applied research methods and tools of innovative marketing, which is due to the importance of the impact of information technology on the socio-economic development of society and human civilization in general. The essence of innovative marketing is revealed as a type of human activity, which involves the use of research and development to identify, form and meet consumer demand through market exchange processes to achieve its own goals. The content of innovative marketing methods is established that have economic, administrative and socio-psychological nature and are manifested by a set of appropriate individual tools. The object of research is the economic and social process, the development of methods and tools of innovative marketing which takes place in the context of digital transformations. The subject of research is a set of theoretical, methodological and practical aspects of the development of methods and tools of innovative marketing. The purpose of scientific work is to substantiate the theoretical and methodological provisions and develop practical recommendations for the development of methods and tools of innovative marketing. Component and characteristic features of universal, basic and special formats of economic tools of innovative marketing are revealed. The administrative characteristics and socio-psychological tools in the context of content marketing, social networks, neuromarketing, guerrilla marketing are presented. Perspective directions of further researches of development of methods and tools of innovative marketing are substantiated.

Keywords:

**ORGANIZATIONAL AND METHODOLOGICAL PROBLEMS OF THE RATIONAL
USE AND PROTECTION OF THE KUYALNYTSKYI ESTUARY LANDS**

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Abstract:

The condition of the Kuyalnytskyi estuary is one of the most acute environmental problems of the Northern Black Sea coast. Scientists are discussing various measures to restore this mega ecosystem, some of which are included in regulatory state and regional documents. However, unfortunately, these measures were only partially implemented and did not solve the problem at all, and sometimes even led to dangerous local consequences. The main purpose of the study is to draw attention to the problems of estuaries of Odesa region and to develop recommendations for identifying solutions to protect environmental safety and conservation of estuaries of the Black Sea. The main objectives of the study are to generalize the current state of the Kuyalnytskyi estuary basin, consideration and assessment of environmental, social and man-made factors, determining the list of possible hazardous impacts on the environment. It is established that the aquatic and terrestrial ecosystems of the Kuyalnytskyi estuary are in a state of crisis due to climate change and the disproportional significant impact of anthropogenic pressure on the waters and the catchment area of the estuary. The Kuyalnytskyi estuary is rapidly losing its ability to restore its natural resource potential. The analysis of the ecological condition of the Kuyalnytskyi estuary shows that the main reasons that hinder the rational use and protection of estuary lands are the lack of scientifically sound, clearly defined development strategy; imperfection of legislative and regulatory support; imperfection of legal, organizational, economic bases for the formation of full-fledged development of the resort and recreational zone of Kuyalnyk.

Keywords:

**MONITORING OF *Plutella xylostella* L. ON WINTER RAPE SEEDS IN THE
CONDITIONS OF THE SOUTH OF UKRAINE**

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Abstract:

Based on the results of observations of the cabbage moth on winter rape crops in the south of the Odessa region, we have compiled a map that clearly shows the distribution of this pest. Surveys were conducted from south to north from 17 February to 20 March. 1 single specimens of adults 2 there are first generation caterpillars 3 solitary pupae 4 there are both pupae and imago 5 all generations meet at the same time Thus, due to the mild winter, the pest overwintered well, and the sharp temperature drops played the role of "natural selection", leaving the strongest individuals. The increase in rapeseed acreage accelerated the spread and increase in the pest population, which was also affected by weak insecticidal protection due to the lack of funds from farmers after a 2-year drought.

Keywords: monitoring, *Plutella xylostella*, winter rape

**PURIFICATION OF LIQUID VEGETABLE OILS USING ELECTROPHYSICAL
FIELDS**

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Abstract:

Biological completeness and ecological safety of food, in particular fatty, products - the most important task in their production. In the production of vegetable oils, ecological purity is achieved by technological treatments that lead to the removal of unwanted compounds and impurities.

Keywords: vegetable oil, requirements, purification, electrophysical field, acids

DYAGNOSTIC AND COMPLEX THERAPY OF CATS, SICK WITH PYELONEPHRITIS

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Abstract:

Nephritis are common nowadays. The main causes of nephritis are toxins in food and water, use of some medication without control. Also, there are a lot of kinds of salt that may cause nephritis. Today there are a lot of methods of diagnostic and treatment of cats, sick with nephritis. However, these methods are not always effective. That is why the purpose of our work was to create the algorithm of diagnostic and complex treatment of cats, sick with pyelonephritis.

Materials for the study were 30 cats, sick with pyelonephritis. Each cat was under exploration for 40 days. In this period every day, we made clinical exploration. Also on the first, twentieth, and fortieth day, we spent laboratory examinations of blood and ultrasound test. Cats were divided into three groups. In the first group, we used amoxiclav 12,5 mg/kg, stop-cystitis 2-3 ml orally twice a day for 30 days, liquid of Ringer 40 ml/kg intravenously once a day for 30 days. In the second group instead of stop-cystitis, we used canephron 1/2 - 1/3 of tab once a day. In the third group, we used canephron 1/2 of tab once a day and fytokit 3 ml orally twice a day.

The results of treatment showed, that complex therapy, which was used for the animals of the third group is the most effective.

Keywords: Pyelonephritis, cats complex therapy, canephron, fytokit

**A STUDY ON THE PRODUCTION OF PROTEIN CONCENTRATE FROM SESAME
BRAN**

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Abstract:

Sesame husk or bran has high protein content. However, this by-product is usually discarded or used directly as animal feed or additive. Sesame proteins contain high content of essential amino acids methionine and tryptophan. Most plant proteins are low in total sulfur amino acids, so sesame is unique in that it has a high total sulfur amino acid content. Therefore, the amino acid composition of sesame protein can be used as a complementary food on cereals and legumes. In addition, the polymeric structure of sesame proteins improves the textural and rheological properties of the food to which it is added. There are many studies in the literature on the production of protein isolate from sesame seeds. However, the number of studies on sesame husk or bran and the protein isolates obtained from them is few. In this study, the production of protein concentrate from sesame bran was investigated. The optimal salt solution concentration, pH and pI point in protein extraction were determined as 1.0 M, 12 and 3.5, respectively. In addition, the protein amounts of defatted sesame bran (DSB) and sesame protein concentrate (SPC) were found to be 12.20% and 24.83%, respectively. The moisture content of DSB was determined as 97.65%, the ash content as 39.76% and the oil content as 1.89%.

Keywords: Bran, husk, defatted, protein, concentrate

**DETERMINATION OF AGRO MORPHOLOGICAL CHARACTERISTICS OF SOME
SUMMER SQUASH INBRED LINES**

ABDURRAHMAN YAŞAR, ÖNDER TÜRKMEN, ZEYNİ DAGTEKİN

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Abstract:

In this research, agromorphological characteristics of some summer squash inbred lines were investigated. In the study, 200 summer squash inbred lines were used. In the 200 summer inbred lines used in the study; Plant Growth Tendency, BranchThrowing in the Plant, Branch Throw Degree, Position of Petiole, Green Color on Body, Stem Shoot Development, Slice Holder in Leaf Blade, Green Color of Leaf Blade Upper Surface, Swelling on the Leaf Blade, Leaf Blade Area, Petiole Length Petiole Diameter Petiole CrossSection Shape Spines on Petiole Leaf-blade: silver patches criteria have been determined.

In this context, it is foreseen that the genetic pool diversity that can be created from inbred lines of summer squash with agro-morphological characteristics can be used in future breeding studies.

Keywords: Summer squash, Agronomic trait

**DETERMINATION OF FRUIT QUALITY OF SOME HYBRID MELON
COMBINATIONS**

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Abstract:

In this study, it was aimed to determine the fruit quality of some hybrid melon combinations. 200 hybrid combinations were formed in the study.

In the hybrid combinations used in the study, fruit weight, fruit length, fruit width, seed house, fruit wall thickness, brix and pH characteristics were determined. It is predicted that the selected combinations can be used to obtain quality fruit in the melon breeding studies to be carried out in the next stage.

Keywords: *Cucumis melo*, Hybrid Melon Fruit Quality

PHENOLIC PROFILE AND BIOACTIVE PROPERTIES OF HALOPHYTIC *Limonium caspium*

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Abstract:

Soil salinity and drought, which are the major abiotic stress in plants, cause over-production and accumulation of reactive oxygen species (ROS) which are highly toxic and reactive. Halophytes, due to their powerful enzymatic and non-enzymatic antioxidant systems, are known for their ability to quench ROS. Synthesis and accumulation of polyphenols in halophytic plants are usually stimulated in response to salt and drought stress. Nowadays, phenolic compounds are in the center of attention as they play a crucial role in preventing oxidation processes and have highly valued functions in improving health and preventing disturbances ranging from cancer to skin disorders. The genus *Limonium* Mill. (*Plumbaginaceae*), is represented by 27 halophytic taxa in Turkey. Taking in consideration of possible high levels of polyphenols and high antioxidant capacity of halophytes, in this study, phenolic compounds of *L. caspium* (Willd.) Gams were qualified and quantified by a LC-MS/MS analysis, total phenolic content, in-vitro antioxidant and enzyme inhibitory activities of the methanol extract from aerial parts and its hexane, dichloromethane, ethyl acetate and water fractions were determined. Tannic acid (6316.55 ± 322.14 g/g) and hyperoside (633.15 ± 31.02 g/g) were found to be the most abundant phenolic acid and flavonoid, respectively. The highest total phenolic content (678.82 ± 7.52 mg GAE/g extract), DPPH radical scavenging activity ($IC_{50} = 16.01 \pm 0.32$ g/mL) and total antioxidant capacity (0.353 ± 0.001 mM UAE, 771.733 ± 2.565 mM CRE) determined in ethyl acetate fraction. While hexane fraction showed weak pancreatic lipase inhibition, the highest tyrosinase inhibitory activities were observed with hexane and ethyl acetate fractions ($IC_{50} = 171.04 \pm 2.35$ and 171.19 ± 352 g/mL, respectively).

Keywords: *Limonium*, *L. caspium*, *Plumbaginaceae*, halophytes, phenolics, LC-MS/MS, antioxidant, pancreatic lipase, antityrosinase

CHEMICAL COMPOSITION OF SESAME BRAN AS A BY-PRODUCT IN TAHINI PRODUCTION

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Abstract:

Sesame bran is a by-product of tahini and halva production, which can be recovered and used as a value-added product. The husk ratio in sesame is very important, because its economic use is limited. It is stated that the husk rate of sesame varies from 10% to 20%. There are many studies on the chemical characterization of sesame seeds in the literature. However, the number of studies on sesame husk or bran is few. In this study, some physicochemical properties of sesame bran, which is obtained as a waste in tahini production, were investigated. According to the analysis results; Dry matter was 97.28%, protein 8.72%, ash 28.81%, oil 26.86% and pH 6.05 in sesame bran. In the sesame processing enterprises in Turkey, 10-12% of the sesame seeds are separated as bran during the process of separating the bran from the sesame. Accordingly, considering the annual total amount of sesame processed (approximately 130,000 tons), approximately 14,000 tons of sesame bran per year are discarded without adequate evaluation or used in a limited way by mixing with animal feed. When the average 10-15% total protein content of sesame bran is taken into account, it is understood that an important vegetable protein source of close to 1,800 tons per year is not utilized well in our country alone. As a result, it is seen that sesame bran, which is heavily wasteful from roasted sesame and tahini production processes in our country, can be considered as a plant protein source rich in antioxidant substances.

Keywords: Bran, husk, moisture, protein, ash

**SOME BROAD BEAN CHARACTERISTICS OF SOME HYBRID KIDNEY BEAN
GENOTYPES APPROPRIATE FOR FRESH CONSUMPTION**

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Abstract:

Kidney bean (*Phaseolus vulgaris* L.) is a self-fertile vegetable with high production and consumption, which is consumed both in fresh beans and in grains, has an indispensable place in the world and in Turkish. The first condition for success in agriculture is the existence of productive varieties suitable for the purpose. For this purpose, it was aimed to obtain new kidney bean varieties suitable for fresh consumption by hybridization method in our study. For this purpose, 17 red kidney bean varieties suitable for fresh consumption were included in the crossing program in 2020 and 14 hybrid kidney bean genotypes were obtained, which were promising at the S2 stage. In this study, measurements and observations of parameters such as color, length, width, surface structure, beak presence and seed number of fresh broad bean were made at S2 level of the hybrid genotypes used.

Keywords: kidney beans, fresh consumption, broad bean properties

VOLATILE COMPOSITION OF THREE LIMONIUM SPECIES GROWING IN TURKEY

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Abstract:

The genus *Limonium* Mill. (*Plumbaginaceae*) is represented by 27 taxa in Turkey. Various species of the genus have been used in traditional medicine in different countries and investigated for their antitumor, immunomodulatory, hepatoprotective, cardioprotective, antioxidant, antibacterial and antiviral potential. However, data on essential oil composition of the genus is limited. In this study, we have investigated volatile compounds of three *Limonium* species growing in Turkey, *L. effusum* (Boiss.) Kuntze, *L. gmelini* (Willd.) Kuntze and *L. pycnanthum* (C.Koch) Kuntze. The air-dried aerial parts of the plants were hydrodistilled for 3 h using a Clevenger-type apparatus to produce a small amount of essential oil which was trapped in n-hexane. The obtained volatile samples were dried over anhydrous sodium sulphate and stored at +4°C in the dark. Essential oils were analyzed by GC and GC/MS systems and 32 compounds were identified. In the oil of the *L. effusum* 27 components were characterized representing 94.8% of the total oil. tricosane (21.0%), heptacosane (16.7%), hexahydro farnesyl acetone (16.0%), nanocosane (9.1%) and pentacosane (8.3%) were found as main constituents. A total of 25 compounds were characterized in

L. gmelini essential oil, representing 90.5% of the total oil with hexahydro farnesyl acetone (20.4%), hexadecanoic acid (15.2%), tricosane (12.3%), nanocosane (10.2%), heptacosane (9.3%) and pentacosane (6.5%). The main components of *L. pycnanthum* oil were determined as hexahydro farnesyl acetone (25.7%), tricosane (19.3%), nanocosane (10.4%), heptacosane (10.2%), pentacosane (6.6%) and 19 components were identified representing 91.1% of the total oil.

Keywords: *Limonium*, *Plumbaginaceae*, *L. effusum*, *L. gmelini*, *L. pycnanthum*, essential oil, GC/MS



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