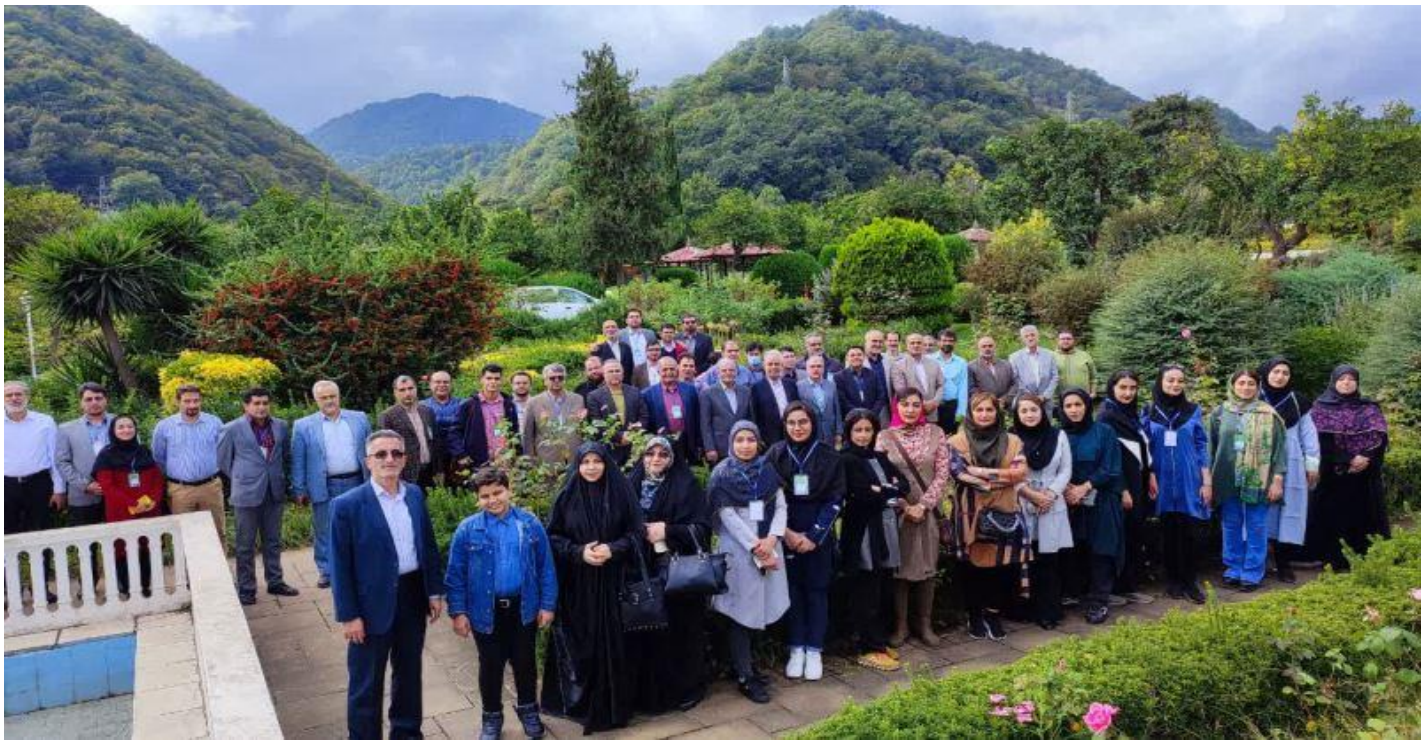

Book of Abstracts

4th International Congress & 5th National Conference on
Biotechnology of Medicinal Plants & Mushrooms
October, 18 & 19 - 2022
Ramsar - Iran

Organized by: University of Zanjan, Sari Agricultural Science and Natural Resources University, Ramsar Governorate & Union Medicinal Plants of Iran

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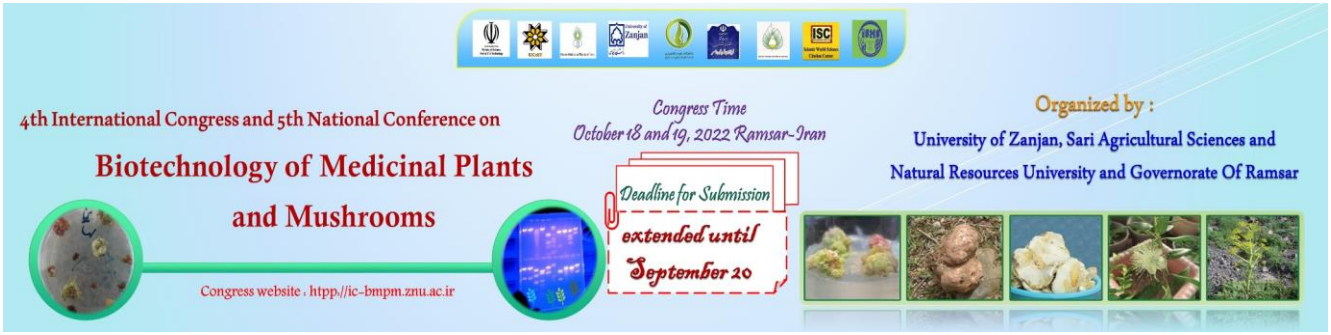

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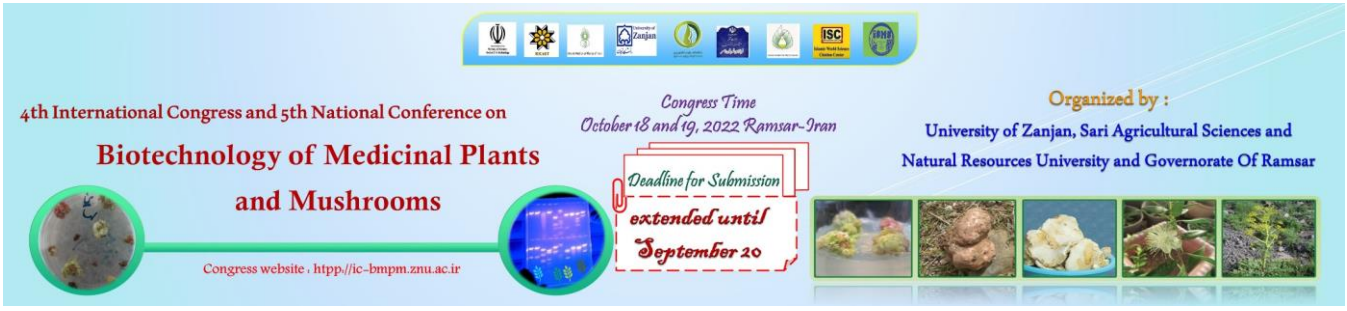

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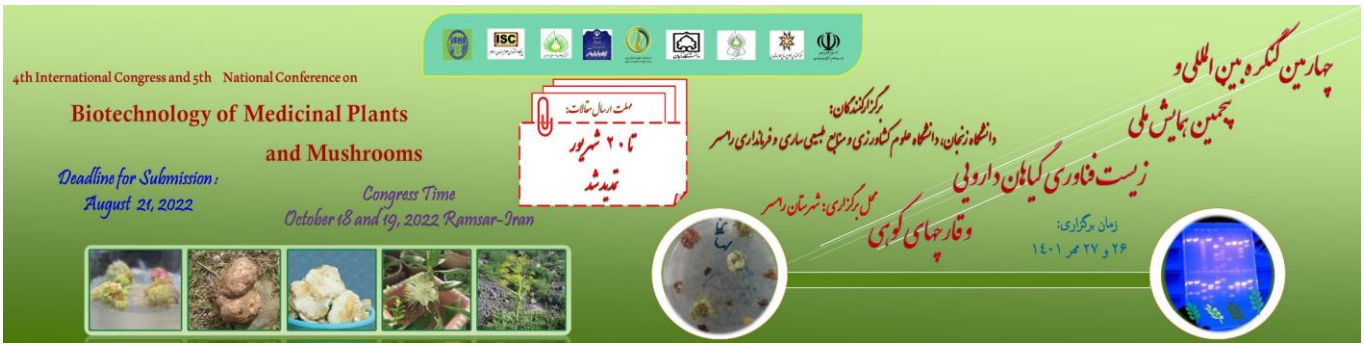

خلاصه مقالات علمی چهارمین کنگره بین المللی وپنجمین همایش ملی

زیست فناوری گیاهان دارویی و قارچهای کوهی

تاریخ برگزاری: ۲۶و۲۷ مهرماه ۱۴۰۱

محل برگزاری: شهرستان رامسر - هتل بزرگ پارسیان رامسر

برگزارکننده: دانشگاه زنجان

با مشارکت و همکاری دانشگاه علوم کشاورزی و منابع طبیعی ساری، فرمانداری رامسر و اتحادیه گیاهان دارویی ایران

پاییز ۱۴۰۱

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پیش گفتار

خداوند منان را بسیار شکرگزاریم که در تداوم برگزاری دوره های منظم قبلی کنگره، توفیقمان بخشید که باهمه تنگناها و ناملایمات، شاهد برپایی چهارمین کنگره بین المللی وپنجمین همایش ملی زیست فناوری گیاهان دارویی و قارچهای کوهی بصورت حضوری ومجازی (ترکیبی) در ۲۶و ۲۷ مهرماه ۱۴۰۱ به میزبانی شهرستان رامسر باشیم. اینک در جمع بندی و گردآوری و انتشار خلاصه مقالات این رویداد مهم، ذکر این نکته را یادآور میشویم که مسولیت صحت و دقت و درستی نتایج و مطالب ارایه شده، اختصاصا و انحصارا بر عهده نویسندگان مقالات بوده و دبیرخانه کنگره جهت حفظ امانت از هرگونه دخل و تصرف در مقالات ارسالی خودداری نموده است. با توجه به تاکیدات مستمر در وبسایت کنگره و نیز در ارتباطات مجازی با ارسال کنندگان مقالات، دال بر رعایت الگو و ادبیات نگارشی و املایی و کنترل دقیق موازین علمی در بیان یافته ها در متون انگلیسی مقالات، فایلهای ارسالی چکیده مقالات پیوست، با این پیش فرض موکد، مورد گردآوری و تنظیم و صفحه بندی و انتشار قرار میگیرد. ضمن تشکر قلبی از همه همکاران و دانشجویان و انجمن های تخصصی داخلی و بین المللی همراه کنگره که ذکر نام و همت بلندشان در این اختصار نمیگنجد، بویژه اعضا محترم کمیته های سیاست گذاری، کمیته علمی و داوران ارجمند و نیز اعضا محترم کمیته اجرایی در ستادهای سه گانه: دانشگاه زنجان، دانشگاه علوم کشاورزی و منابع طبیعی ساری و ستاد اجرایی فرمانداری رامسر و نیز عوامل اجرایی دبیرخانه دایمی کنگره در پژوهشکده فناوریهای نوین زیستی دانشگاه زنجان، توفیق همه محققین و پژوهشگران عرصه زیست فناوری گیاهان دارویی و قارچهای کوهی را در گستره گیتی، در ارتقا و بهبود این بخش از علوم زیستی بارویکرد استفاده بهینه از فناوریهای سازگار با طبیعت، از خداوند بزرگ خواستاریم.

علی عمارلو

بهرام ملکی زنجانی

آذرماه ۱۴۰۱

چهارمین کنگره بین المللی و پنجمین همایش ملی
زیست فناوری گیاهان دارویی و قارچهای کوهی

برگزار کنندگان:
دانشگاه زنجان
دانشگاه علوم کشاورزی و منابع طبیعی ساری
فرمانداری رامسر

زمان برگزاری: ۲۶ و ۲۷ مهر ۱۴۰۱

محل برگزاری: شهرستان رامسر

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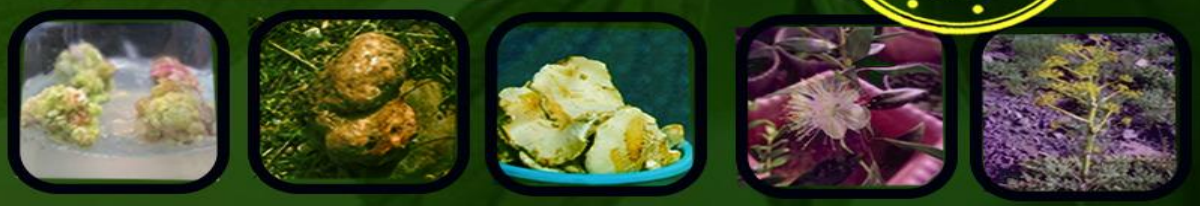

محورهای اصلی:

۱. مهندسی ژنتیک، تنوع ژنتیکی، کشت بافت، بیان ژن، متابولیت های ثانویه، فیزیولوژی گیاهان و قارچهای دارویی
۲. داروهای گیاهی و طبیعی مبتنی بر زیست فناوری
۳. زیست فناوری و زیست شناسی قارچهای کوهی، سمی، خوراکی و صنعتی
۴. تجارت فناوری های نوین زیستی در حوزه گیاهان دارویی، داروهای گیاهی، قارچهای کوهی و صنعتی
۵. صنایع مرتبط با زیست فناوری گیاهان دارویی و قارچهای کوهی
۶. گیاهان دارویی، حفاظت از مراتع و محیط زیست
۷. سایر پژوهش های مرتبط با گیاهان دارویی، قارچهای دارویی و مشتقات دارویی

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The application of immunocytochemistry to the study of medicinal plant species

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Abstract

The study of medicinal plants and pharmacognosy is a multidisciplinary area of scientific endeavor, which often involves the use of a variety of molecular and cell biological techniques. One such technique is immunocytochemistry and the associated technique of immunogold labelling transmission electron microscopy, which can be used to identify the cellular location of a particular molecule, or macromolecule of medicinal interest. This presentation is concerned with the application of these techniques to the study of medicinal plant species, using an example from research performed in my laboratory, in collaboration with staff based at Yunnan Agricultural University, China on the Chinese medicinal plant species *Amorphophallus konjac* and the medicinal polysaccharide konjac glucomannan which is extracted from corms of this species. Konjac glucomannan (KGM) is a soluble fibre, which has a long history of use in China and S.E. Asia, both as a food source and as a Traditional Chinese Medicine (TCM). Recently, KGM has also been used in the development of dietary supplements as it has been shown to improve lipid metabolism, reduce blood glucose, relieve constipation, and promote satiety. Before such foodstuffs and nutraceutical products can be sold and used more widely in the West, more detailed information is required on the productivity, biosynthesis, and analysis/quality assurance for both cost-effective production and safe use. Therefore, research is required to address questions relating to the improvement of corm productivity, KGM biosynthesis, purification, and assay of KGM and subsequent product safety and effectiveness. In the current study three main areas were being investigated 1) Good Agricultural Practice (GAP) for konjac in collaboration with Yunnan Agricultural University (YAU) in concert with physiological experiments on cultivars and species of interest at University of Wolverhampton (UoW); 2) Good Laboratory Practice (GLP) to improve the extraction, purification and analysis of konjac flour and KGM from plants grown at YAU and UoW; 3) an investigation of the biosynthesis and physicochemical properties of KGM. Here we present some of our data on the developmental regulation of glucomannan synthesis in developing corms of *A. konjac* via immunocytochemistry and how this technique (and immunogold labelling transmission electron microscopy), could be used for research on other plant species of medicinal interest.

Keywords: Medicinal plants, Pharmacognosy, Molecular and cell Biological techniques.

Uncovering Potential Anticancer Mechanisms of Caper Fruits by Network Pharmacology and Molecular Docking

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Abstract

Medicinal plants have been used since ancient times as one of the most important therapeutic agents, as they have multiple beneficial effects and health-promoting potentials. Caper (*Capparis spinosa* L.) is one of the most common medicinal plants used in traditional medicine to treat many human diseases, such as rheumatism, gastrointestinal problems, headaches, toothaches, skin diseases, earaches, kidney and liver diseases. A wide range of evidence has recently shown that this plant has different biological activities, including antioxidant, anticancer, antibacterial, analgesic, anti-hemorrhoid, antirheumatic, anti-inflammatory, antidiabetic, and hepatoprotective effects, due to its enormous diversity of bioactive constituents, including alkaloids, flavonoids, glucosinolates, phenolic acids, sterols, terpenoids and more. In the present study, multiple molecular databases and pharmacological bioinformatics analyzes were performed to reveal the potential mechanisms of the active components of caper fruit (*C. spinosa*) in the prevention of cancer metastasis. Accordingly, network-based bioinformatics databases including ChEBI, DIGEP-Pred, Human GeneCards, DisGeNET, STRING, Cytoscape, Gene Ontology (GO)-Kyoto Encyclopedia of Genes and Genomes (KEGG) were used to determine the target genes, proteins, and molecular pathways modulated by phytochemicals of *C. spinosa* fruits. In addition, AutoDockTools, AutoDock Vina, PLIP Web tool, and PYMOL were conducted for Molecular docking between hub targets and bioactive components. Capparisine, capparin, glococapparin, glucobrassicin, cappariloside, quercetin, ginkgetin, isoquercetin, isorhamnetin, apigenin, and kaempferol were determined the major bioactive components, and the corresponding gene targets of these components were also identified in this research. MAPK1, MAPK14, TP53, STAT3, IL-4, CCND1, and RELA were proven targets to combine successfully with the active components of *C. spinosa* fruits. GO analysis and KEGG analysis elucidated that caper fruits could prevent metastasis primarily by modulating signaling pathways in cancer, including oxidative stress, inflammation, and microRNAs through induction of G2/M cell cycle arrest, stimulation of proinflammatory cytokines, activation of nuclear factor kappa B (NF-kB) and hypoxia-inducible factor-1α (HIF1-α) signaling pathways. This research has also revealed that caper fruits with active phytochemicals exhibit highly active anticancer activity involved in multiple biological processes, signaling pathways, and gene targets.

Keywords: Cancer, metastasis, molecular docking, traditional medicine, medicinal plants, apoptosis,

SEED CHARACTERS IN AIZOACEAE

A. P. Sukhorukov[1,2], M. V. Nilova[1], M. A. Kushunina[1,2], C. Klak[3]

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2 Tomsk State University, Tomsk, Russia
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Abstract

The Aizoaceae includes ~1880 species and is one of the large and diversified groups within the Caryophyllales. Most species in the Aizoaceae are perennial leaf-succulent dwarf shrubs which are most diverse in the arid areas in the western part of southern Africa. As a response to harsh climatic factors, many members have evolved special reproductive adaptations such as hygrochastic capsules (mostly Mesembryanthemoideae and Ruschioideae), associated burr-like indehiscent diaspores and one-seeded winged diaspores, and fast seed germination after rainfalls. Our study focused on the anatomical features, the evolutionary trends and ecological significance of the seed structures. The seeds of 125 species from 40 genera in their recent circumscription were studied, and eighteen morphological and anatomical seed characters were discovered. The seed notch and embryo shape are added to the characters distinguishing the major clades within the family; presence of longitudinal ridges and seed keel are found to be additional characters for Aizooideae and Ruschioideae-Apatesieae, respectively. Puzzle-like borders of the testal cells are a common trait in the Ruschioideae and the Mesembryanthemoideae. Most taxa in the Aizoaceae have a thin seed coat, which is the ancestral character state within the family and may facilitate fast germination. We observed multiple shifts to a medium or thick seed coat in taxa belonging to the Ruschioideae and the Acrosanthoideae, which inhabit fire-prone environments (fynbos or renosterveld vegetation) where the seed coat may function as a protection against fire damage. Many-seeded fruits are the ancestral state within the Aizoaceae, with multiple shifts to a reduction of 1–2 seeds per fruit, which are only found in xerochastic fruits. The latter are dispersed via autochory, zoochory or anemochory and evolved mainly in the little succulent subfamilies Acrosanthoideae, Aizooideae, and Sesuvioideae. In the highly succulent subfamilies Ruschioideae and Mesembryanthemoideae, fruits are almost exclusively many-seeded and hygrochastic with an ombrohydrochoric mode of dispersal, and they share many character states. Reduction of the number of seeds within a dispersal unit is rare and genera within the small tribe Apatesieae and *Ruschianthemum* (Ruschieae, Ruschioideae) are unusual cases as their fruits fall apart into 1–2 seeded mericarps (distributed mainly by wind). All seed characters studied in the Aizoaceae were compared with those of other families from the core Caryophyllales.

Keywords: Aizoaceae, Caryophyllales, Seed characters.

Medicinal Plants of Loktak Lake: A Ramsar site wetland

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Abstract

A Ramsar site is a site of wetland which are designated to be of international importance by the "Convention of Wetlands" in 1971. Such wetlands are unique or rare in their ecology withsignificant biodiversity and supports vulnerable, endangered, critically endangered species orthreatened ecological communities. There are number of such wetlands having soundecological values identified in India. 75 Ramsar sites have been identified in India. Amongthem, Loktak Lake, situated in Manipur state comes under Ramsar site. Loktak Lake is a lifelineof many people of Manipur and home of many rare, endangered, endemic and medicinal plants.Medicinal plants are collected by the local communities and use against different healthcareproblems in traditional ways. Hence, documentation of such plants is very important toconserve indigenous traditional practices for the formulation of future drugs. Therefore, anattempt has been made to document the plants of Loktak Lake which is used for medicinalpurposes by the local communities. About 88 medicinal plants have been enumerated fromLoktak Lake. Conserving such medicinal plants along with the use of it in traditional practicesis important as a source of future drug development.

Keywords: Indigenous traditional practices, future drugs, medicinal plants

Phytochemical characterization of aqueous extracts of *Melia azedarach* L.

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Abstract

Intensive agricultural systems have a strong environmental impact in many ecosystems. In particular, the use of synthetic chemical compounds to enhance the yield of plants for agricultural use often alter soil and water ecosystems. Recently, a more sustainable agriculture capable of reducing the impact on endemic flora and fauna is developing in many parts of the world. For all these reasons, the phytochemical profile of an aqueous extract of *Melia azedarach* L was characterized in this work. In particular, the initial objective was the identification and quantification of azadirachtin (AZD) within the aqueous extract of the aerial parts by HPLC-MS. Subsequently, the toxicity of the aqueous extract was evaluated on cell lines FB-21 (primary culture of human fibroblasts) and SH-SY5Y (human neuroblastoma cell line). The results showed that in the starting phytoextract the concentration of AZD is equal to 108.34 µg/mL. Furthermore, toxicity tests showed that FB-21 cells are more sensitive to all treatments than SH-SY5Y cells, which may be due to the different nature of the cells. Furthermore, the MTT assay has shown that the toxic effect of the phytoextract is greater than that of the single standard compound. This response can be traced back to the effect of the numerous secondary metabolites present in the aqueous extract used and still under identification.

Keywords: Medicinal plants, phytochemical, aqueous extract, secondary metabolites

Cordyceps militaris: A high prized medicinal mushroom of Himalayas

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Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu

Abstract

Cordyceps militaris is an entomopathogenic fungus and its wild type distribution is at thealtitude around 3800 m above sea level. It has a long history of widespread use in folk medicines.Owing to its huge medicinal potential it is sold at a whooping price of 4,500 dollars per Kg dryweight. The addition of Cordyceps militaris to global mushroom cultivation isescalating. The knowledge of use of Cordyceps militaries is many centuries old. People in India,China, Tibet, Nepal and Bhutan have long been using Cordyceps for medicinal purpose. Preferableenvironment for Cordyceps is cold, grassy and alpine meadows of Himalayas. The base of themushroom first originates from larval body. As it infects larvae it first grows inside larvae body andfurther club like fruit body emerges out of larvae body. It has numerous medicinal values whichadds to its popularity. It possesses anti aging, anti inflammatory, anti cancer, antidiabetic,antihypertensive, pro-sexual, immune modulatory, anti bacterial, antioxidants, hepatoprotectiveand many neurological potentials. It is wisely used as supplements and in medicines. ManyCordyceps products like Capsules, fruit body and mycelium powder, Cordyceps tea and cordycepswine are available. Cordyceps extracts are also used in many cosmetic products. Cordycepin is animportant ingredient in Cordyceps that contribute to its market value. Numerous studies andreports have described the effect of Cordyceps, including enhancement of immunity, activation ofbasal metabolism, and improvement of liver and renal functions

Keywords: Entomopathogenic fungus, Distribution, Cordycepin.

Medicinal Parasitic and Carnivorous Plants

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Abstract

About 4750 parasitic and 800 carnivorous plants have been reported worldwide, but very few documentations are available on their medicinal values. Proper addressing and evaluation of their therapeutic potential could be helpful to develop herbal or synthetic drugs to mitigate global healthcare problems. Over 17 million deaths are recorded yearly due to infectious diseases and disorders. This death could be stopped with the local formulation and from unexplored plant species. Among the unexplored plants, parasitic and carnivorous might be the first choice due to less documentation and availability of diverse bioactive compounds. In the present study, we gathered the medicinal information of 3 parasitic (*Dendrophthoe falcata, Cassytha filiformis*, *Cuscuta reflexa*) and 5 carnivorous plants (*Drosera burmannii, Drosera indica, Utricularia aurea, Utricularia gibba, Utricularia polygaloides*) available in Odisha state, India. The pharmacological activities of selected plants are evaluated and found to have potent therapeutic values. The findings revealed that most of the selected plant species have antibacterial and anthelmintic activities in respiratory problems. Further advanced research is needed to characterize the active constituents in selected parasitic and carnivorous plant species.

Keywords: Parasitic plants, carnivorous plants, unexplored plants, enzyme, medicinal values, pharmacological values

Mycochemical, Antimicrobial, Antioxidant, Haemolytic and Cytotoxic activities of different solvent extracts of *Russula* rosea and *Russula cyanoxantha* from Similipal Biosphere Reserve, Odisha, India

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Abstract

Wild edible mushrooms are a seasonal source of livelihood and food for tribal communities. This study explored the biological properties of two wild growing *Russula* species (*R. rosea, R. **cyanoxantha***) from Similipal Biosphere Reserve Odisha, India. Mycochemical, along with antimicrobial, antioxidant, hemolytic and cytotoxic activities of crude extracts (ethanol, chloroform and water) of two mushrooms were studied. The studied mushrooms displayed moderate antimicrobial properties with zones of inhibition ranging from 1.2 ± 0.4 to 2.70 ± 0.7 mm against four human pathogens(*Staphylococus aurius, E. coli, Pseudomonas auriginosa* and *Bacillus* sp.). The mushroom extracts showed 2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) (ABTS), 2,2-diphenyl-1-picrylhydrazyl (DPPH), *DMPD*(N,Ndimethypphenylendiamine) and *FRAP*(ferric reducing ability of power) activities, to different extents. The haemolytic effects of the ethanol extracts mushroom studied on human erythrocytes at 0.1 and 0.2 mg/ml concentration exhibited less thatn 5 % haemolytic activity. The mushrooms ethanol extracts also exhibited cytotoxic activity with an IC_{50} value of 50.0 µg/ml. Qualitative mycochemical analysis revealed presence of alkaloids, glycosides, saponins with very low flavonoids and tannin contents. The Fourier-transform infrared spectroscopy (FTIR) analysis revealed the presence of different functional groups as mycoconstituents. The study indicated that these two wild edible mushrooms can be used as nutraceuticals/functional foods to promote health benefits.

Keywords: Wild edible mushrooms, Crude extracts, bioactivity, mycochemicals, Russula rosea.

Potential correlation between the probiotic properties of honey isolates and their applied polysaccharides polymers

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Abstract

Honey has attracted the attention of scientists recently. The researchers have focused on the products of the honey isolates as an antimicrobial, an antioxidant, and an anticancer agent, besides its great role in the immune system improvement. On the other hand, researchers were directed towards the isolation and identification of honey dominant spores. But until today no bioactivity sufficient studies were done on these spores especially in the enzymatic area. This research article will focus on honey bacterial and fungal isolates and the ability of them to produce different enzymes such as levansucrase, dextransucrase, and chitinase. A few years ago, the polysaccharides from bacterial honey isolates were recommended as a multifunction agent that could play a great role in the immune system improvement. This article paid attention to the bacterial honey isolates that have probiotic features. Furthermore, it tries to highlight their importance as a unique source of very important enzymes. Also, the capability of them to yield two of the most important polysaccharides, such as levan and dextran, is remarkable. Furthermore, it will focus on the applications of the polysaccharides yielded by honey isolates with unique properties as a cancer-protective, antiviral, antioxidant, fibrinolytic agent, anticoagulant, prebiotic, cures peptic ulcers, and anticancer. These properties will be investigated in this study. Finally, this article focused on the recommendation of bee honey as a new reservoir for probiotic bacteria producing applied polysaccharides.

Keywords: Polysaccharides polymers, Honey isolates, Probiotic bacteria

Lepiota metulispora: An imperative source of some secondary metabolites, antibacterial and antioxidant agents

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Abstract

The proposed study evaluates the mycochemical composition, antioxidant and antibacterial potential of the *Lepiota metulispora*. Mycochemical analysis revealed the presence of secondary metabolites such as flavonoids, terpenoids, cardiac glycosides and saponins. The antioxidant potential of ethanolic extract of *Lepiota metulispora* was assessed using four assays like 2,2-diphenyl-1-picryl-hydrazyl-hydrate (DPPH), 2,2′-azino-bis-3-ethylbenzothiazoline-6-suphonic acid (ABTS), total flavonoid contents (TFC), and total phenolic content (TPC). The DPPH radical scavenging assay showed the maximum percent inhibition of the extract (71.5%±0.145%). Antibacterial activity of mushroom was evaluated against two gram-positive and two gram-negative bacterial strains using agar well diffusion method. Chloroformic extract of *Lepiota metullispora* exhibited highest antibacterial potential with inhibition zone (29.5±0.289 mm) against *Staphylococcus aureus* as compared to other bacterial strains. From these findings, it could be assessed that *Lepiota metullispora* can be used as antibacterial and antioxidant agents to manufacture pharmaceutical drugs and might be used in future.

Keywords: mycochemical screening, mushrooms, secondary metabolites, antibacterial activity, antioxidant potential

Meristem Culture Studies on the Tree of the Miraculous Plant *Moringa Peregrina* (Forssk.)

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Abstract

Moringa peregrina (forssk), from the Moringaceae family native to India, is cultivated in tropical and subtropical regions of the world. It has nutritional, medical, environmental, industrial and economic value. Today, the importance of aromatic medicinal plants against many diseases such as cancer and diabetes is increasing day by day around the world. It has attracted attention in traditional medicine research due to its important effects. It is rich in many important nutrients, including vitamins A, C, E, K, magnesium, zinc, selenium, zeatin, chlorophyll, β-sitosterol, and alpha-carotene. In view of these properties reproduction and conservation of this plant is very valuable. The seeds were sterilized and transferred to the WPM culture medium to germinate them. Thereafter, these were regenerated on different concentrations of NAA+BAP and 2,4-D for regeneration and callus induction from cotyledon node explants. Callus regeneration was noted on 40% cotyledon node explants, 1.25 mg/l BAP + 0.1 mg/liter NAA and 80% callus formation were obtained on WPM culture medium containing 0.75 mg/l 2,4-D. The highest callus formation (80%) on cotyledon explant was obtained on WPM culture medium containing 0.75 mg/l 2,4-D. The resulting shoots were rooted in a rooting medium containing 1.25 mg/l IBA. The plants were transferred and adapted to external conditions.

Key words: *Moringa peregrina* (forssk.), callus meristem culture, micropropagation, WPM culture medium and medicinal plants

The importance of generating and applying big data and establishing databases specific to medicinal plants based on OMICS approaches

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Abstract

Medicinal herbs have been used for thousands of years and have great impacts on people life-style from birth to the death. They come to our table as food, bioenergetics drinks, and medicine. The consumption of medicinal herbs has increased in the last decades due to their beneficial health effects related to a wide range of diverse secondary metabolites. However, in comparison with other crops, there is less OMICS information available for medicinal plants yet. Such an inadequate knowledge resulted in a big gap in their pre-breeding and breeding programs, their mode of action, biosynthesis pathways, potential adverse reactions, and interactions with existing pharmaceuticals and functional foods. Therefore, generating and applying big data and establishing databases specific to medicinal plants will have a huge revolutionary impact on medicinal herbs. During last decade several new approaches have been developed particularly based on OMICS approaches, led to deeper understanding of genome context, genes and related biological processes in medicinal plants, and their proteome and metabolome profiles. Consequently, the enormous amount of data generated need to be archived in databases, processed and analyzed. Sequencing the whole genome of some medicinal plants just recently has provided a spark of light to answer the questions and ambiguities more accurately. These genomic sequences can be integrated with transcriptome, proteome and metabolome data to unravel the mysteries of biological process in medicinal herbs. Nevertheless, to use such big data we have to think big and multidisciplinary. For big data management and analysis as well, we have to do paradigm shift in concepts, skills and tools. In this case, frameworks such as HADOOP, and tools such as MapReduce, Java, and Pig further improve storing and processing efficiency and the accuracy and performance of our modules. Eventually, we have to consider all challenges like data privacy, data security, and data accessibility to fulfill all related necessary infrastructures towards establishment a database.

Keywords: Integrated OMICS, Systems biology, Gene network, Genome, Big data

Using in silico methods to identify anti-alzheimer compounds in the ethyl acetate extract of *Herpesis Kurdica* F. Dvorak & Hadak

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Abstract

Nowadays, in silico methodologies have become a crucial part of the drug discovery process. This is mostly because they can impact the entire drug development trajectory, identifying and discovering new potential drugs with a significant reduction to cost and time. Furthermore, computer-aided drug design (CADD) approaches are important for reducing the experimental use of animals for in vivo testing, for aiding the design of safer drugs, and for repositioning known drugs, assisting medicinal chemists at each step (design, discovery, development, and hit-optimization) during the drug discovery process. In addition, conventional methods for drug discovery involve the costly random screening of synthesized compounds or natural products.

In this study, software techniques of molecular networking and molecular docking were carried out to identify effective anti-alzheimer components of *Hesperis kurdica* F. Dvorák & Hadac.

Ethyl acetate extract of *H. kurdica* was injected into an ultra-high-performance liquid chromatography coupled to a sequential mass spectrometer (UPLC-MS-MS) in both positive and negative modes, to dereplicate its chemical constituents through the molecular networking technique. Then the acetylcholine esterase inhibitory (ACHE) activity of dereplicated compounds were assigned using a molecular docking analysis.

According to the obtained results, germacrene D (18.91 %) was found as the most components in the flower's essential oil.

Keywords: In-silico method, Molecular docking, Molecular networking, Anti-alzheimer.

Reaction of different Plant Species in Response to Callus Induction

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Abstract

It is necessary to use breeding techniques in the breeding of medicinal and agricultural plants and to improve the quantity and quality of effective substances in them for the production of high-yielding plants. Factors affecting callus production and regeneration include genotype, growth regulators, culture medium, age and type of explant, and environmental conditions. In this research, the induction of callus in seven plant species (*Daucus carota*, *Dracocephalum kotschyi*, *Hyssopus officinalis*, *Galega officinalis*, *Amsonia tubemaemontana*, *Moringa oliefera*, *Urtica dioica*) has been investigated *in vitro*. It was evaluated in MS and WPM cultures with different concentrations of growth regulators. For this purpose, a factorial experiment was designed in the form of a Completely Randomized Design (CRD), and genotypic effects in callus induction and subsequent plant propagation were observed. The results showed that *Daucus carota*, *Moringa oliefera* and *Hyssopus officinalis* were significantly different from other species in terms of callus induction.

Keywords: callus induction, organogenesis, medicinal plants, genotype, growth regulators

Advances and Perspectives in Tissue Culture, Genetic Engineering and Biotechnology of Cannabis: An important medicinal plant

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Abstract

Cannabis sativa, originating from temperate Asia (e.g., Iran, Afghanistan, China) has been widely used for therapeutic and industrial purposes. Due to its increasing demand in medicine, recreation, and industry, there is a dire need to apply new biotechnological tools to introduce new genotypes with desirable traits and enhanced secondary metabolite production. Micropropagation, conservation, cell suspension culture, hairy root culture, polyploidy manipulation, and *Agrobacterium*-mediated gene transformation have been studied and used in cannabis. However, some obstacles such as the low rate of transgenic plant regeneration and low efficiency of secondary metabolite production in hairy root culture and cell suspension culture have restricted the application of these approaches in cannabis. In this presentation, *in vitro* culture and genetic engineering methods in cannabis along with other promising techniques such as morphogenic genes, new computational approaches such as machine learning, CRISPR methods such as CRISPR/Cas9-equipped *Agrobacterium*-mediated genome editing and hairy root culture, that can help improving gene transformation and plant regeneration as well as enhancing secondary metabolite production, will be highlighted and discussed.

Barijeh(galbanom) a strategic plant

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Absterac

Barijeh, Balijeh, Ghasni, refers to the gum of a number of Ferula plants, which all belong to the Umbelliferae or Apiacea family. This family has 275 genera and 2850 species. The Ferula genus has 133 species, and the gum *F.gumosa* is known under the name "Barijeh" in Iran. The plants of this family are mostly two-year or multi-year herbaceous (rarely woody) with interspersed stems, alternate leaves with many divisions and broad pods, umbellate inflorescences, bisexual flowers, and two-hazel fruits. In foreign scientific sources, the Barijah plant was registered and named in 1884 in the northern areas of Iran by a person called Buhse. Ferula with the scientific name *Ferula gumosa* Boiss. and the English name of Galbanum and from the Umbellifera family, a perennial plant up to 2 meters tall, the leaves are divided with several cuts and are dusty green and covered with webs, its flowers are yellow, its stem is narrow and cylindrical; Because barijeh is a monocarpic plant, care must be taken in cutting it so that it does not happen in the year it flowers.

Applications of barijah gum: pharmaceutical industry, antibacterial, anti-inflammatory and diuretic, antiseptic, lactating agent, laxative, expectorant, stimulant and invigorator, anticonvulsant, stomach tonic, wound healer, antispasmodic, carminative, as well as barijah essential oil. Acne-causing microbes are effective. Application in the perfume and cologne industry, jewelry industry, preparation of a kind of glue, military industry and production of insecticides. The main harvesting areas of Barija gum in Iran are: Tehran province, Razavi Khorasan province, North Khorasan province and Mazandaran province. Among the best export markets of Iranian cargo, we can mention the following countries: UAE, Germany, Austria, France, India, Turkey and Spain.

By domesticating and cultivating these plants, it is possible to control its yield and active substance, and by operating in a variety and sometimes in a breed, we can witness an increase in yield and active substance. With the indiscriminate harvesting of these plants, irreparable damage is also caused to the area's pasture and vegetation and even causes soil erosion. So, domesticating and cultivating this plant is necessary and important so that we can have a better and more harvest by spending less money and less pressure on pastures.

Keywords: Medicinal plants, Ferulla, Pharmaceutical industry.

Molecular study of selected genes involved in flavonoid biosynthesis pathway in two cumin ecotypes

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Abstract

Active substances or secondary metabolites in medicinal plants are regularly produced in response to biotic and abiotic stresses and determine the ability of plants to adapt during growth and development. In order to increase the quantity and quality of the effective substance of the green cumin medicinal plant, with the scientific name *Cuminum cyminum L* from the Apiace family, we need to identify the germplasm and useful genes in domestic and wild populations of this plant. In the current research, five selected genes in the biosynthesis pathway of flavonoids in cumin, as a result of previous research based on NGS method, which had the most expression changes, were identified and validated at the genome level. DNA was extracted from the young leaves of selected ecotypes cultivated for three weeks and quality was measured with agarose gel. According to the design of the primer based on these five sequences and conducting the PCR test and observing the single band in all cases, it was found that there is no difference in the length of the amplified fragment among the selected ecotypes; Therefore, the length polymorphism of the fragments resulting from the multiplication was rejected due to the presence of deletion and addition regions between different genotypes. Since the two studied ecotypes of Sadouq and Rafsanjan were placed in two different groups in terms of seed yield, essential oil and extract content, for further investigation at the nucleotide sequence level, through sequencing, two PCR products from different genes (1196 and 32640) was selected and studied in these two ecotypes. The expression of the product of these two genes in these two ecotypes has been reported differently and in two different ways. So that gene 1196 is a glycosyltransferase in the path of biosynthesis of phenolic compounds and gene 32640 is a transcription factor in path of anthocyanin biosynthesis. Therefore, no difference was shown at the genomic (nucleotide) level between the two ecotypes in terms of these two sequences; Therefore, it is likely that the regulation of the biosynthetic pathway takes place at the level of transcription or aft.

Key words: gene validation, cumin, flavonoids, secondary metabolites

Bioinformatics study of selected genes involved in the biosynthesis of flavonoids in cumin

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Abstract

Cumin is an annual and herbaceous plant belonging to the parsley family, which in diploid state has the formula 2n =2x=14 and is one of the oldest and most economical medicinal plants. Since little genetic information is available about this valuable plant, in the current research, five selected genes effective in the biosynthesis of flavonoids, which were identified by NGS method in cumin and had the most expression changes, were studied bioinformatically. Among these, two genes, DN32640 and DN1196, which had the greatest evolutionary distance and were from two different families, were investigated for further identification. The DN1196 gene from the GT6 family is a glycosyltransferase in the biosynthesis pathway of phenolic compounds, and the DN32640 gene from the BHLH family is a transcription factor in the anthocyanin biosynthesis pathway. According to bioinformatics studies, the coded protein of the sequence DN1196, with more than %85 similarity with a protein from the carrot plant, glycosylates it in the final step of the synthesis of a flavonol by transferring a glucose molecule. In this process, two transcription factor proteins interact with this protein. The predicted secondary structure of the product of this gene was identified in accordance with the carrot protein sequence. The encoded protein of DN32640 sequence, with more than %90 similarity to carrot protein, is a transcription factor of BHLH family and part of MBW complex, which is a combination of MYB, BHLH and WD40 protein families. This transcription factor is involved in regulating the final stages of the path leading to the biosynthesis of anthocyanins and tannins. The secondary structure of this gene product was determined based on the identified protein sequence of carrot. Considering the importance of these two genes and the interaction of their product with other proteins, they can be used in genetic manipulations to produce more phenolic compounds, especially anthocyanins in cumin.

Key words: bioinformatics, prediction, cumin, secondary structure, flavonoids

The effects of growth regulators on regeneration of *Smyrnium cordifolium* Boiss under *in vitro* conditions.

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Abstract

Avondol (*Smyrnium cordifolium*) is one of the most valuable medicinal plants and its use has a long history in the world. The aim of this study was to investigate the effect of growth regulators on the regeneration of various organs of the avondol in in vitro conditions. This study was conducted in tissue culture laboratory of Research Center of Agricultural and Natural Resources of Kermanshah as a factorial experiment in a completely randomized design with 3 replications. Factors of explant (leaf and stem) plant growth regulators of 2,4-D (0, 0.25, 0.5, 1, 2 and 4 mg/l) and BA (0, 0.25, 0.5 and 1, mg/l) were examined. Six week after planting, callus color, callus formation rate, percentage of callus regeneration, callus diameter and callus fresh weight were recorded.The results showed that the highest callus formation rate in 2 mg/l 2,4-D alone, the highest percentage of callus formation of explants in 1 and 2 mg/l 2,4-D alone was obtained in stem explants. The highest callus diameter in the treatment of 2 mg/l 2,4-D alone and the highest weight in 1 and 2 mg/l 2,4-D alone and 2 mg/l 2,4-D with 0.25 mg/l BAwas obtained.

In order to direct regeneration, same calli were cultured on growth regulators BA (0.25, 0.5 and 1 mg/l) and IBA (0, 0.25, 0.5 mg/l) in MS medium with 3 replications. Six weeks after replanting the calli grew and did not regenerate. The results of the second experiment showed that the highest callus formation rate and callus diameter were obtained in combination of 0.5 mg/l BA alone. The highest percentage of callus formation was observed in two hormonal compounds: 0.5 mg/l BA alone and 1 mg/l BA with 0.25 mg/l IBA. The highest callus weight was obtained in 1 mg/l BA alone.

Keywords: Avondol, Plant growth regulators, Regeneration, Tissue culture.

Decreasing pomegranate fruit cracking using tree foliar spraying by organic fertilizer

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Abstract

The aim of the current work is decreasing of pomegranate fruit cracking using foliar application of organic fertilizer. To this, fertilizer was applied in two concentrations of 0 (control) and 3 $ml.L^{-1}$ on three cultivars namely, Malas-e Saveh, Yusefkhani and Naderi through factorial experiment based on randomized complete block design. Spraying was used at three times intervals, beginning in July and repeated every one month. Based on the results, the fertilizer plummeted fruit cracking significantly, i.e., 54% in comparison to control. Also, it prevented deep fruit cracking via changing it to minor skin crack. Based on the studied traits, the fertilizer made its effect on fruit cracking, to some in part, through changes in nutrient elements composition of fruit's skin. Meanwhile, the genetic differences among pomegranate genotypes influenced their responses to foliar application. In this term, the cultivar Malas-e Saveh showed much more positive interaction to fertilizer with compare to two other cultivars.

Keywords: pomegranate, fruit cracking, aloe vera gel, foliar application

Investigating the effects of salicylic acid and jasmonic acid on phenolic compounds, flavonoids and antioxidant activity of stevia (Stevia rebaudiana Bertoni) in vitro

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Abstract

Effects of salicylic acid and jasmonic acid on phenolic, flavonoid compounds and antioxidant activity of *Stevia rebaudiana* Bertoni under *in vitro* condition Stevia (*Stevia rebaudiana* Bertoni) belonging to the Asteraceae family, native to the northern regions of South America namely Paraguay and Brazil (Salazar et al., 2018). Stevia is used as a substitute for sucrose in the food and pharmaceutical industries due to its natural sweetening glycosides (Raina et al., 2013). In order to study the effect of salicylic and jasmonic acid on some physiological traits of stevia under *in vitro* conditions, a completely randomized design with four replications was conducted at University of Zanjan. Treatments were including salicylic acid and jasmonic acid at three levels (0.05, 0.1, 0.2) mM compared with control (MS medium) and their influence on total phenol (Folin Cicalto method), total flavonoids (aluminum chloride method) and antioxidant activity (DPPH method) of foliage. Analysis of variance showed that total phenol, flavonoid and antioxidant capacity were significantly affected by the applied growth regulators. The highest total phenol content (1849 mg GAE/100 g DW) was obtained in 0.2 mM salicylic acid. Total flavonoid content varied from 12.85 (control) to 19.31 (0.1 mM jasmonic acid QE/100 g DW). Also, application of salicylic acid and jasmonic acid treatments increased the content of antioxidant activity compared to the control. According to the results of the present study, it was found that application of the studied growth regulators increases total flavonoids, phenolic compounds and antioxidant activity of stevia.

The effect of Cyanobacteria on licorice plant growth

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Abstract

Medicinal plants play essential roles as active biological resources in pharmaceutical and food industries. Licorice (*Glycyrrhiza glabra* L.) is one of the strategic medicinal plants in world, whose roots contain many medicinal metabolites such as glycyrrhizic acid, which has been reported to have several properties, including antiviral, anti-inflammatory, anti-cancer, and drug carrier effects. In this study, licorice seedlings were inoculated with a strain of cyanobacteria, *Anabaena sphaerica* to investigate the microbe-plant and microbe-microbe interactions on plant growth in greenhouse conditions .Forty-five days after bacterial inoculation, the fresh and dry weight of the roots and shoots of the plant were evaluated. Bulk and rhizosphere soil of the treated and control plants were collected and soil suspension with different concentrations was prepared. To investigate the change of culturable bacterial communities, soil suspension with 10^6 dilution was cultured on TSA medium. Plants treated with *A. sphaerica* showed a significant effect in terms of increasing fresh root weight (26%) and dry weight root-to-shoot ratio (three-fold) compared to the control. In addition, a significant difference was observed in terms of the increase in richness and abundance of bacteria in the rhizosphere of the treated plants compared to the control ($p<0.05$). *A. sphaerica* can induce licorice plant root growth by changing rhizospheric bacteria. The results of this study suggest the use of bacterial agents to improve the growth, development, and quantitative and qualitative performance of medicinal plants, especially licorice.

Keywords*:* Microbiome, plant-microbe interaction, *Anabaena sphaerica*, and rhizosphere

The effect of ascorbic acid on the the amount of chlorophyll a, b and proline of *Salicornia persica* AKHANI under salt stress

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Abstract

In the most regions of the world, salinity stress is the most important stress that limits the growth of plants and its performance by decreasing the osmotic potential and disrupting the obsorption ofwater and some nutrients. *Salicornia Persica*, is a halophyte and annual plant and resistant to the salinity. Ascorbic acid can increase resistance of plant than stress through stimulating the activity of antioxidant enzymes. An experiment was carried out in2019 in the research greenhouse of Malayer University in a factorial format in a completely randomized design, in order to evaluate the effect of different concentrations of Ascorbic acid (0,0/2mm) on the morphological characteristics of *Salicornia Persica*, under the conditions of salinity stress (0,300ppm,600ppm). The results showed that salinity stress caused a significant increase in the dry weight of aerial parts. On the other hand, spraying with Ascorbic acid caused an increase in the dry weight of aerial parts. Salinity caused a reduction in the amount of photosynthetic pigments. The amount of Proline increased at 300ppm salinity and decreased at 600ppm salinity. Generally, it can be conclded that spraying of *Salicornia Persica* with Ascorbic acid improved the growth and the tolerance of this plant against the effects of salinity.

Key words: The number of leaves, dry weight, photosynthetic pigments, Proline

Somatic Embryogenesis in Tea (*Camellia sinenesis*L.) using 2,4-D

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Abstract

An efficient *in vitro* plant regeneration system is somatic embryogenesis. Plant growth regulator 2,4-dichlorophenoxyacetic acid (2,4-D) wasassessed individually for its effectiveness to induce somatic embryogenesis intea (*Camellia sinenesis*L.). Embryonic axes and cotyledons explants were dissectedfrom the seeds. Explants were cultured on Murashige and Skoog (MS)medium containing 0, 1 and 5 µM 2,4-D alone for embryonic axes and 0, 1and 5 µM 2,4-D along with 0 and 0.5 µM IBA for cotyledons. Embryos wereobserved in embryonic axes explants cultured on MS medium containing 1µM 2,4-D. No somatic embryos were seen on cotyledons explants.

Keywords: *In vitro* culture, 2,4-D, Plant growth regulators, Micropropagation.

Geographical distribution of Violaceae in Iran focusing on new research on medicinal Viola sp.

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Abstract

The *Violaceae* comprises 806-1000 predominately tropical and temperate species in 25 currently recognized genera. Viola section is one of the largest groups of the *Violaceae* family. Infra generic classification has varied, but recent phylogenetic analysis indicates that the genus can be subdivided into two subgenera and 16 sections worldwide. Five sections belonging to subgenus Viola are present in Iran: Section Melanium Ging., Section Plagiostigma Godr.,Section Viola, Section Sclerosium W. Becker, and the section 'Spathulidium' . Violet family is one of the small plant family in Iran with a genus of Viola and species diverse between 14 to 22 species, based on different Floras and other neighboring country Floras, here we refer to a list of which is given together with Scientific, English, Persian names with English letters, Type locality and its habitat of each species in Iran. In this article, we described the geographical distribution of the genera of *Violaceae* in Iran by provincial habitats and with a complete list of species and also endemic species of violets in Iran. Only *Viola spathulata* is endemic in Iran and type locality of *V. alba* is from Iran. Hot points of violet distribution are northern Iran in Gorgan, Mazandaran, Gilan provinces and Arasbaran district. Only *V. modesta* and *V. occulta* have more wide distribution than other species. Only *V. occulta* and *V. pachyrrhiza* penetrate to central part of Iran and *V. odorata*, *V. occulta* and *V. pachyrrhiza* in Zagrosian mountains, *Viola cinerea* and its Synonymous just growing in South of Iran, and only *V. Sieheana* penetrate to north Khorasan. Contrary to popular belief a few species of Viola as: *V. alba, V. modesta, V. occulta, V. odorata, V. pachyrrhiza, V. rupestris, V. sieheana, V. somchetica, V. spathulata and V. suavis* growing up to above the timberline and sometimes in the high mountains. In the final part of this research we described and introduced the first Live Collection of Iranian Viola sp. (LCIV) site and its future programs for develop the critical information and knowledge for Iranian Violet ecotypes based on controlled greenhouse and field conditions in University of Zanjan.

Key words: Medicinal plants, violaceae, viola sp., geographical distribution.

Assessment of Copper Phytoremediation of Copper Potential Capability and Its Effect on Enzymatic and Non-enzymatic Antioxidant Defense System in *Chrysanthemum indicum* L.

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Abstract

One of the most important challenges of soil pollution in natural ecosystems all over the world, especially in our country, is soil pollution to heavy metals. Among the ways to confront this dangerous pollution, phytoremediation has attracted all the attention as a green, safe and environmentally friendly method. In this study, the ability of *Chrysanthemum indicum* phytoremediation potential of copper has been investigated. In this experiment, plants were under stress for 56 days at 0, 100, 200 and 400 mg/kg of copper concentrations. According to the results, *C.indicum* showed the capability of absorbance and tolerance of 311.2 mg/kg Cu DW in the root tissue and 70.7 mg/kg Cu DW in the aerial parts at the highest applied concentration. In the concentrations of 100 and 200 mg/kg, 49.3 and 150.7 mg/kg in the root and 20.8 and 43.9 mg/kg in the shoot was showed respectively. Also, the activity of SOD, APX and CAT enzymes, which are involved in the enzymatic antioxidant defense system, was evaluated. According to the results, although the total protein content decreased under stress, the activity of SOD enzyme in roots and shoots increased by increasing Cu concentration in the plant growth medium. The activities of APX and CAT enzymes in root and shoot tissues were significantly increased compared to the control. Also, the content of total phenol and carotenoids was assessed to investigate the non-enzymatic antioxidant system, which the results showed that by increasing copper in the plant growth medium, the amount of total phenol and carotenoids increases too. According to these results, increasing the activity of enzymatic and non-enzymatic antioxidant systems act as valuable biomarkers for copper tolerance in *C.indicum* plant. *C.indicum* showed well potential to Cu accumulating in its root system by uptake from soil and, stabilizing and preservation in its root, which could be used as a stabilizer plant confront to high level of Cu.

Keyword: Heavy metals, *Chrysanthemum indicum*, Catalase, Phenol, Carotenoid, Copper

The effect of silver ion elicitor on the expression of monoterpenes biosynthesis pathway genes in *Salvia officinalis*

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Abstract

Salvia officinalis is one of aromatic medicinal plant that rich in essential oils such as monoterpenes. Due to potential use of them as source of natural medicinal compounds, increasing the secondary metabolites content have been investigated in many researches. Use of elicitors as signals triggering the secondary metabolites production is one of the most effective strategy for improving the bioactive compounds content. In this study for the first time, the effects of silver nitrate ($AgNO_3$) (0,5,25, and 50 µM) as an abiotic elicitor were studied on monoterpenes genes expression, *ss*,*cs*, and *bos* gene, by Real-Time PCR method. Results demonstrated that the expression of *ss*,*cs*, and *bos* genes increased in transcription level in *Salvia officinalise* leaves, under foliar spray of $AgNO_3$ elicitor. So, it seems that use of elicitors can be effective on induced the gene expression and increase of secondary metabolites content of *S. officinalis*.

Key words: Abiotic elicitors, Common sage, Gene expression, Medicinal plant, Monoterpenes

Studying the distribution of Shekartighal (Echinops ssp) in Zanjan province

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Abstract

Shekartighal (Echinops ssp) is one of the substances used in traditional medicine, which has been used as a traditional medicine since ancient times. The genus Echinops belongs to the Asteraceae and so far 120 species have been reported from all over the world. According to Iranica flora, 54 species of Echinops are distributed in different parts of Iran which has laxative and pain-relieving properties. Botanical, morphological and habitat investigations determined that our productive species have spherical flower clusters, the same in terms of stem length, and in terms of habitat conditions, they grow in similar conditions. Also, the investigation of the life cycle of the insect and the production method of Man Shekartigal showed that the place of formation of man is on the base of the leaf and the life stages of the insect including different ages of larva, pupa and complete insect are passed inside the capsule which is Man Shekartigal. These species are branched and distributed in the highlands of the province .The altitude distribution of Echinops plant in Zanjan province was observed to be 900-2400 meters .Shekartighal production in Zanjan province is not significant and its collection is not cost-effective.

Key words: Shakratighal, Man, altitude, capsule

Carbon nanotubes: A promising nanocarrier for gene transfer to plant cells

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Abstract

The classical methods of plant genetic transformation have bottlenecks to achieve plants with interesting genotypes. In plant transformation process, biomolecules must delivery to plant cell packet by pass through rigid plant cell wall. So, nanotechnology has widely operated various nanomaterials such as single carbon nanotubes (SWCNTs) in the medicine and biological sciences to obtain better-targeted gene delivery through Nanocarriers. In this regard, Nanoparticles shown that able to pass through plant cell and internalize in plant cell. In this study, we prepared a SWCNTs-nanocarrier with 100% loading efficiencies DNA. Also, we note that a simple gene delivery method to walled plant cells. Therefore, nanobiotechnology and nanoparticles can be a window of hope to improve and to increase the efficiency of conventional methods of gene transfer to plant cells.

Key words: Plant breeding, Plant genetic transformation, Nanocarrier, Single walled carbon nanotubes

The recent trends on lab-on-a-chip microfluidic technologies

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Advances in microfabrication techniques enable lab-on-a-chip technology to develop basic science and applied technologies such as biomedical and biochemical analysis research. LOC is now an area of intense research, and technological development has grown exponentially in recent years, and brings substantial improvement relative to traditional macroscale biochemical and chemical systems. Lab-on-a-chip technology has the potential to prepare high-throughput, rapid, safe, reliable, and low-cost diagnostic tools by integration and parallelization of material handling, chemical processes, detection, and measurement on a single chip. These miniaturized labs can develop point-of-care systems and diagnosis of infectious diseases by detecting biomarkers in saliva, blood, serum, and exhaled breath in a microfluidic device. The emergence of the Covid-19 also stresses the importance of accurate and rapid detecting lab-on-chip devices. Despite all the improvements, LOC still has a long way to go, and in turn, research for a cost-effective, high-efficiency strategy for the mass production of LOC devices is crucial. Microfluidic LOC devices deal with two major considerations which are fluid flow and sample process. The fluidic part is a critical section regarding its fabrication method and also the basis of fluid driving. This part commonly fabricated by the costly soft lithography technique. Therefore, many efforts have been made to develop inexpensive, robust, scalable fabrication methods for such devices. Fluid flow basis is categorized to active and passive fluid driving paradigms, among which passive methods are more compatible with the aim of POC. Sample processing, to be more precise pathogen detection procedures, carry out in two main classes including immunological- and molecular- based detection methods. One of the main advantages of serological methods for point-of-care applications is incredibly low sample-to-answer time. On the other hand, molecular-based techniques offer more reliable and quantitative mode of detection. This work highlights lab-on-a-chip technology in disease diagnosis, particularly point-of-care diagnostic test devices and the required bio-sensors to detect different types of biomarkers. First, lithographic and non-lithographic techniques, including 3-D printing, molding, and laminating to fabricate microfluidic devices using biocompatible materials are presented. Secondly, we cover the recent trends in utilizing electrochemical, optical, and nanomaterial-based sensors as well as PCR-based microfluidic detection setups for biomedical diagnostic purposes. Biosensors have unique physicochemical properties due to their high surface-to-volume ratio, controllable morphology, low power consumption, and miniaturization ability, while PCR-based methods benefit from high specificity and sensitivity. Finally, the feasibility and principal challenges of integrating nanomaterial-based sensors and molecular amplification procedure with microfluidic systems are discussed.

Keywords: Microfluidics – Point of Care (POC) – Lab on Chip (LOC)

Elicitation of phenolic content production of *Salvia officinalise* by abiotic elicitors of Salicylic acid and silver nitrate

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Abstract

Phenolic compounds are one of the main secondary metabolites of medicinal plant *Salvia officinalise*. Due to potential use of them as source of natural antioxidants, increasing the phenolic content of medicinal plants have been investigated in many researches. Use of elicitors as signals triggering the secondary metabolites production is one of the most effective strategy for improving the bioactive secondary metabolites content. In this study, the effects of applied foliar spray of abiotic elicitors, Salicylic acid (SA) and silver nitrate ($AgNO_3$) on phenolic compounds were studied in a CRD design with three replications in greenhouse. Results shown a significant increase for phenolic content under the influence of SA and $AgNO_3$ elicitors. The $AgNO_3$ effect on phenolic content was significantly more than SA for all used concentration. It seems that by key role of antioxidant defense system throught phenolic compounds in the defense mechanisms followed induced the increase of secondary metabolites content of *S. officinalise*.

Key words: Abiotic elicitors, Common sage, Medicinal plant, Salicylic acid, silver nitrate

Study on flowering and seeding systems on two Iranian important medicinal *Viola* sp.

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Abstract

Aromatic violet or medicinal violet is one of the seasonal, wild plants that generally grows at the foot of forest trees and sometimes in mountain pastures in late winter to mid-spring and has a special place in Iranian culture. In the northern regions of Iran, perhaps the only flower that sits at the top of the Haft-e-Sin tablecloth of the Iranian Nowruz celebration is fresh violet blossoms. Violet oil, which is obtained by soaking and dipping medicinal violet petals in base oils such as olive oil or sesame oil, has medicinal properties for treating coughs and colds, and is also used to increase the freshness and softness of the skin. As mentioned, all violet species in Iran are seasonal and wild, and recently there have been reports of domestication of its medicinal species at University of Zanjan and trying for its cultivation. Considering that most of the violet species introduced in Iran are based on morphological characteristics based on collection from wild habitats and the possibility of misidentifying them is not far from the mind, so in parallel with the creation of live violet collections that their vegetative and growth comparisons are possible under similar conditions, their necessity of molecular studies is essential. In this research two important Iranian medicinal violets including *V. alba* & . *V. sieheana* were selected for flowering and seeding systems. The biological traits such as growing behavior, leaf size, plant heigh, flower color, flower size, seed setting, seed size, seed number on a fruit, … were studied during 2018 to 2022. Based on our observation and morphological analysis, the *V. alba* with violet flowers had one time flowering in late winter to early spring as chasmogamous (CH) flowers with 5-10 seed on fruits, but V. *sieheana* had two flowering times in a year (early fall and late winter) with white flowers with 15 -25 seeds on a fruit including chasmogamous, cleistogamous (CL) and semi chasmogamous flowers. This report based on repeated statistical experiments is the first in this genus.

Key words: Medicinal plants, flowering systems, seed setting, *Violaceae*.

The effect of naphthalene acetic acid, benzylaminopurine and kinetin on somatic embryogenesis and regeneration of henbane plant (*Hyoscyamus niger*)

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Abstract

Hyoscyamus niger is an important medicinal plant of the Solanaceae family, which is a rich source of hyoscyamine and scopolamine alkaloids. These compounds are used to relieve spasms, relieve pain, dilate the pupils, and treat motion sickness. This study was performed to determine the effects of auxin plant growth regulators including naphthalene acetic acid (0, 0.25, 0.50, and 0.75 mg/L) and cytokinins including benzylaminopurine and kinetin (0, 1, 2, and 3 mg/L) on the regeneration of the leaf and petiole explants of the *H. niger*. The results of this study showed that the type of explant, different concentrations of naphthalene acetic acid, cytokinins, the interaction effect of explant and naphthalene acetic acid, explant and cytokinins, naphthalene acetic acid and cytokinins, and explant, naphthalene acetic acid and cytokinins had a significant effect on the percentage of callusing, fresh weight of callus, percentage of somatic embryogenesis, percentage of rooting, percentage of shooting, number of roots and shoots. In general, the highest percentage of callusing (100%) and fresh weight of callus (1182.08 mg/explant) were obtained in leaf explant at MS medium containing 0.50 mg/L of naphthalene acetic acid and 3 mg/L of benzylaminopurine and in the leaf explant at MS medium containing 0.50 mg/L naphthalene acetic acid and 2 mg/L kinetin. Also, the highest percentage of somatic embryogenesis (100%), percentage of rooting (76.67%), percentage of shooting (80.00%), number of roots (5.44 per explant), and number of shoots (6.27 per explant) were in the leaf explant at MS medium supplemented with 0.50 mg/L naphthalene acetic acid and 3 mg/L benzylaminopurine.

Keywords: Henbane, Plant growth regulator, Regeneration, Rooting, Shooting

A review of medicinal capacities and therapeutic effects of aromatic violets

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Abstract

The demand for medicinal plants is increasing day by day all over the world to improve the quality of life. Viola odorata blooms in early spring in continental climates with delicate flowers with an attractive scent. Traditionally, it is part of various native preparations and is used to treat respiratory and inflammatory diseases. This article deals with medicinal capacities and therapeutic effects of aromatic violets. Descriptive research method is based on library studies. Articles according to the keywords of "Medicinal capacity", "cure", "Herbal therapy" and "Viola odorata" was extracted and reviewed in foreign journals during the years 2005 to 2022. Viola odorata has shown anti-inflammatory, anti-pyretic, anti-bacterial, hepatoprotective activity. Viola odorata TPM therapeutic products include violet oil for topical or nasal use for nervous and skin disorders, as well as tablets, decoctions, sweet syrups, and sweet or semi-solid edible products for skin, respiratory, digestive, and urinary diseases. Flavonoids, saponins and alkaloids are responsible for the medicinal activities. Although the aromatic Viola plant contains different plant compounds and different plant components that are responsible for different medicinal effects of the plant, more research should be done to evaluate the mechanism of action of medicinal plants with different activities.

Key words: violet, Viola odorata, medicinal properties.

Green synthesis of iron nanoparticles using the aqueous extract of watercress medicinal plant collected from Maragheh County

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Abstract

Today, the synthesis of iron nanoparticles by green synthesis method without using chemicals has received a lot of attention. One of the most important methods of synthesis is the production of metal nanoparticles using medicinal plants. Due to the disadvantages of chemical and physical methods of nanoparticle synthesis, such as weak structure, low production rate, and high production cost, researchers use plant sources as the most suitable method for nanoparticle synthesis. In this research, the extract of watercress (*Nasturtium officinale*) was used to investigate the synthesis of iron nanoparticles. In this study, for the synthesis of iron nanoparticles, a solution of iron chloride was added to the aqueous extract of the aerial parts of watercress. The synthesis of iron nanoparticles was investigated by changing the color of the solution and using spectrophotometry and FTIR spectroscopy. In the obtained results, the formation of iron nanoparticles was confirmed by changing the color from yellow to brown after adding iron chloride to watercress extract. Also, infrared spectrum analysis of formed nanoparticles showed the presence of different functional groups. The formation of iron nanoparticles was done by examining its absorption spectrum by UV-Vis spectrophotometer in the wavelength range of 200 to 600 nm.

Key Words: Green Synthesis, Watercress, Aqueous Extract, Iron Nanoparticles

Hairy root Induction of *Foeniculum vulgare* Miller with Three Different Phenological Courses in Two Methods, Inplanta and Tissue Culture by *Agrobacterium rhizogenes* and Protocol Optimization

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Abstract

This study was conducted with the aim of investigating the induction of hairy roots in fennel plant (*Foeniculum vulgare* Miller.). In this research, the effects of two strains of Agrobacterium rhizogenes A4 and ATCC15834 on three genotypes of Hajiabad, Meshkin Shahr and Fasa respectively with late, mid and early phenological courses and using cotyledon, hypocotyl, root, leaf and stem explants was evaluated. This research was done in two environmental conditions. Induction of hairy roots was done in laboratory environment using MS culture medium containing cefotaxime antibiotic and in greenhouse in culture trays containing cocopeat and perlite (Inplanta). The inoculation time of the explants was 30 minutes, with a concentration of 0.8 in OD600, and the co-cultivation time was recorded as 48 hours. Differences were realized in the frequency of hairy root induction of three types of *F.vulgare* genotypes and their explants. The highest ferequency of induction in Haji Abad genotype with A4 strain in hypocotyl explant was 63%, the highest ferequency in Meshkin Shahr's genotype with A4 in cotyledon explant was 53% and the highest in Fasa's genotype with ATCC15834 in cotyledon explant was recorded 70%. This percentage in Inplanta method (the direct injection in the tissue), showed the highest percentage of transgenics with 27% belonged to Fasa variety using ATCC15834 strain. Treatment of ascorbic acid and darkness, simultaneously, for the first 7 days after induction reduced the amount of browning of explants. In comparing the average of 5 explants of cotyledon, hypocotyl, leaf, stem and root, cotyledon showed the highest rate of transformation with 70%. Variance analysis of hairy root number transformation percentage between three genotypes, in cotyledon, hypocotyl and leaf explants and two bacterial strains showed a significant difference. Transgenic status in hairy roots was confirmed by PCR and by examining *rol*C and *rol*B genes. Thus, hairyroot induction can be applied as an alternative method for the production of secondary metabolites and also as a novel method in metabolic engineering

Keywords: Agrobacterium rhizogenesis, fennel, root hair, Inplanta, phenology course

Isolation and molecular identification of endophytic bacteria from *Nepeta crispa*

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Abstract

Introduction: Endophytic bacteria are non-pathogenic microorganisms living in plant tissues that increase metabolism, growth and plant resistance against pathogens and environmental stresses. endophyte microorganisms activate the components and biochemical pathways of plant cells by producing secondary metabolites, extracellular enzymes and other substances. These microorganisms are a new source of bio-chemical active compounds with high potential to be used in medical, agricultural and industrial fields. This study was conducted in order to molecular identification of endophytic bacteria from *Nepeta crispa* L. in Hamadan province.

Materials and methods: 12 healthy plants were collected from three different areas of the *N. crispa* habitat in Hamadan province. Explants of roots, stems and leaves were surface disinfected and cultured on Nutrient Agar (NA) medium. After isolation of endophytic bacteria, purification was done by single clone method and for molecular identification, DNA extraction was done using Denazist extraction kit. PCR process was performed to amplify the gene region of 16SrRNA (using 27F and 1492R primers). Sequencing of PCR products was done by Microsynth company, Switzerland. The studied isolates were analyzed based on the results of BLAST search on the NCBI site and phylogeny based on the 116SrRNA region and were identified based on their matching with the reference species with the mentioned similarity percentage.

Results: Finally, in this research, 11 isolates were isolated and molecularly identified, and the results showed that all isolated bacteria were belong to Bacillales order. The maximum number of endophyte bacteria isolated in this research, were *Bacillus subtilis* bacteria (%18.18) (%97.17 similarity with the access number MH040981.1) and *Bacillus pumilus* (%18.18) (%94.83 similarity with the access number OP223406.1) that isolated from the tissue of root and stem, respectively. The following bacteria were also isolated and identified from this plant:

Bacillus cereus (%89.64 similarity with the accession number MN793064.1), *Providencia rettgeri* (%95.85 similarity with the accession number MN589673.1), *Bacillus amyloliquefaciens* (%96.93 similarity with the accession number MT397274.1), *Bacillus velezensis* (%97.74 similarity with accession number OP060623.1), *Bacillus mobilis* (%98.21 similarity with accession number CP031443.1), *Bacillus licheniformis* (%97.61 similarity with accession number MT679253.1), *Bacillus thuringensis* (%100.00 similarity with access number KF054891.1).

C**onclusion**: *Bacillus* is the most abundant endophytic bacteria isolated from *N. crispa* in the mountainous ecosystem of Hamadan province. This study showed that endophytic actinobacteria are a rich source of biologically active secondary metabolites with diverse chemical structures that have significant potential in the production of biotechnology, pharmaceutical and medical products. This is the first study that reports the presence of the mentioned endophytic bacteria in *N. crispa*.

Keywords: Endophyte, *Nepeta crispa*, PCR, Molecular Identification

The volatile constituent's analysis of Parietaria officinalis from ira

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Abstract

Parietaria officinalis L the native range of this species is E.central and S.Europe to N.Iran and Turkmenistan .it is a perennial and grows primarly in the temperate biome.it is used as a medicine and for food.Gas Chromatography with flame ionization detector (GC-FID) and Mass Spectrometery (MS) associated with a gas chromatograph (GC) (GC-MS) techniques were performed to investigate the constituents of the essential oil of *Parietaria officinalis* growing wild in Iran. Among 65 observed compounds, 62 components were identified, constituting approximately 98.2% of the oil. The oil was rich in geranyl acetate(15.0 %), Viridiflorol (8.9%), trans-β-Ionone (4.8%), Caryophyllene oxide (4.7%), Hexahydrofarnesyl acetone (4.2%), 2,3-Epoxygeranial (4.2%), Bornyl angelate (2.3%) and (-)-Spathulenol (2.2 %).

Keywords*:* Parietaria officinalis; urticaceae; essential oil; Geranyl acetate

Preserving and strengthening biodiversity is necessary for the survival of agricultural ecosystems and their effective role in the revival of Lake Urmia

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Abstract

Biodiversity is necessary for the survival of life on earth and includes a network of all living organisms, including human races, animals, plants, fungi and single-celled organisms. In addition, it provides essential and basic human needs such as food, clothing and housing. It also guarantees the health of human society, natural and economic prosperity, the development and progress of all-round mankind. On the other hand, genetic reserves are one of the important pillars of development, and the need to protect plant, animal and micro-organism species and prevent their extinction in order to optimally exploit them has a special place in sustainable development. In the meantime, the lack of attention and carelessness in environmental issues and biodiversity in the ecosystems on the edge of Lake Urmia has caused the balance to be disturbed and pressure on the natural ecosystems. Most conservation strategies begin with conserving species in protected areas. If the conservation of biodiversity is not only for protected areas, but to ensure the survival of living organisms, a sustainable ecosystem is needed along with management strategies, protection and optimal use of water and soil, encouraging the preservation and strengthening of native biodiversity in the areas where people live. , has it. In fact, maintaining biodiversity in both agricultural ecosystems and natural areas is very effective in reviving Lake Urmia. The correct and principled development and use of water transfer and distribution technology is one of the effective factors in reducing the biodiversity of agricultural ecosystems, especially in Lake Urmia, which can play a major role in maintaining and strengthening biodiversity, returning to sustainable agriculture and reducing the consequences of climate change. to show.

Key words: biodiversity, ecosystem, Urmia, species, genetic resources.

Effect of endophytic fungi isolated from Licorice (*Glycyrrhiza glabra*) on *Candida glabrata* in laboratory conditions

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Abstract

Introduction: Licorice **(***Glycyrrhizaglabra*) is a medicinal plant that grows in many regions around the world. This plant has anti-inflammatory, antibacterial, antioxidant and expectorant properties and is effective in detoxification and liver protection. Licorice root is mentioned as medicine in most pharmacopoeias and has been used medicinally in America for about 4000 years and has been registered in China and other countries. Licorice is used to treat gastritis, respiratory infections in traditional Asian and European medicine, and to treat hepatitis, tumor growth, and heart diseases in traditional Chinese medicine. Endophytes are closely related to plant pathogens, but they have limited pathogenicity and probably evolved from plant pathogenic fungi. The symbiosis between plant and endophyte has been proven; In this way, the plant protects and nourishes the endophyte, and the endophyte, in turn, produces plant growth-regulating bioactive substances that increase the growth and strength of the host's competition in nature. Therefore, the antagonistic effect of endophytic fungi from Licorice with human pathogenic fungi was considered.

Materials and methods: The plants were collected in summer, 2021 from three different areas of Hamadan province. After surface disinfection, the explants (including stem, leaf and root segments) were cultured on PDA medium. After that, endophytic fungi isolated from Licorice were used and their biocontrol and antagonistic ability was evaluated by cross-culture on PDA against human pathogenic fungi such as *Candida glabrata* (PFCC =52971) (from Pasteur Institute). Test was performed based on a randomized complete block design with 5 treatments (4 endophytic fungi +control) and nine replications. Statistical analysis was performed by SPSS 20.0 software and means comparing was done by Duncan test at 0.05 level.

Results: Results showed endophytic fungi had significant effect on studied *Candida glabrata* ($P<0.01$), therefore, *Aspergillus niger* and *Fusarium oxysporum* (endophytic fungus) had maximum and minimum effect on this fungus with inhibition percentage of 83.90% and 23.40%, respectively. Also, comparison of means based on Duncan's test showed that *Aspergillus niger* and *Fusarium f.sp* had similar effect on *C. glabrata* and were statistically placed at the same level (with the average radius of fungal growth equal to 25.67 and 25.17 mm, respectively).

Conclusion: Endophytic fungi including *A. niger* and *Fusarium f.sp* can be promising microorganisms for the future as a biological control and antagonist in studied human pathogenic fungi.

Keywords: Licorice, Endophytic fungi, *Candida glabrata***,** antagonist

Application of modern technologies in improvement and increasing the production of medicinal plants

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Abstract

In recent years, the improvement of medicinal plants has been considered as a key factor in the improvement of medicinal plants. Almost a quarter of the drugs prepared in the world are of herbal origin, which are either directly extracted from plants or modulated and synthesized based on herbal composition. The most important need of the industry is to obtain homogeneous and high quality pharmaceutical raw materials. On the other hand, creating cultivars with a high percentage of effective substances, high production potential, favorable growth habit and phenology, resistance to living and non-living stresses and their modification for mechanized systems will increase the economic benefit of cultivation and the happiness of farmers to produce medicinal plants. The use of new technologies such as biotechnological methods can increase the efficiency and productivity of medicinal plants as renewable resources for drug production. Biotechnological techniques using solutions such as investigating and creating somaclonal diversity in plants obtained from tissue culture in order to select plants with high yield of effective substances, developing molecular markers in order to investigate diversity, genetic structure and preparing genetic maps for accurate identification. important medicinal plant species, creating and maintaining the genetic diversity of medicinal species at risk of extinction, cytogenetic investigation of important medicinal species and creating plants with different ploidy levels for genetic studies and application in breeding programs, Identification and transfer of genes responsible for the biosynthesis of secondary metabolites and metabolic engineering in order to produce valuable pharmaceutical raw materials through controlled in vitro cultures, studying the transcriptome, proteome and metabolome of plants with valuable metabolites Medicine can be very useful and commercially profitable. This article is a review of new technologies that are effective in improving and increasing the productivity of medicinal plants.

Keywords: Biotechnology, Domestication, Medicinal plants, Secondary metabolites

Isolation, sequencing and bioinformatics studies of the promoter of germacrine D synthase gene in basil

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Abstract

Basil (*Ocimum basilicum* L.) is an aromatic plant that is used as a medicinal plant in traditional Iranian medicine. Today, researchers use metabolic engineering approaches as a promising field to increase rare compounds in plants. For this purpose, it is necessary to have a correct understanding of the gene expression process of biosynthetic pathways and how to regulate them. Identifying and sequencing specific promoters and examining them from a practical point of view is one of the most important goals of gene expression studies. Among the terpenoids, the volatile sesquiterpene compound Germacrine D is formed, which is very important in the mechanism of plant tolerance against various environmental stresses due to its defensive effects. Germacrine D is mainly derived from the mevalonate pathway and is processed by Germacrine D synthase (GerS) is synthesized. In order to study how to regulate the *GerS* gene expression pattern in different environmental conditions, the isolation, characterization and *in silico* analysis of the pObGerS promoter was also performed. The results showed that in the promoter of this gene There are a large number of motifs responding to light and environmental conditions, several regulatory elements such as TATA and CAAT boxes. Also, motifs responding to light, motifs responding to heat, drought and abiotic factors were also identified in the obtained sequence. These results can help to understand how germacrene D synthesis is regulated and facilitate its metabolic engineering.

Key words: Basil, GerS gene, promoter, regulatory and functional active elements

Callus and hairy root induction in the medicinal plant of *Withania coagulans* (Stocks) Dunal

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Abstract

The seeds of *Withania coagulans* were purchased form Barij Essence Company (Kashan, Iran). The seedlings were initially prepared in MS medium, then the leaf explants were employed for callus induction in the MS culture media containing benzyl aminopurine (BAP) and 2,4-D (each with three concentrations of 0.1, 0.3 and 0.5 mg/liter; a total of 9 hormone treatments), based on a completely randomized design (CRD; three replicates over five successive weeks). Also, two strains of *Agrobacterium rhizogenes* known as R1000 and GM were used to induce hairy roots. Based on the ANOVA results, a significant difference was observed between different treatments in terms of three attributes of fresh weight, dry weight, and callus volume ($p < 0.01$). Considering mean comparison results, a significant difference was observed between the "0.1 mg/L 2,4-D + 0.5 mg/L BAP" treatment [with the highest amounts of fresh weight (3.024 g), dry weight (0.082 g), and callus volume (16.91 cm^3)] and the remaining 8 treatments (Duncan's test, $p < 0.05$). Considering cluster analysis, the superior treatment of "0.1 mg/L 2,4-D + 0.5 mg/L BAP" was placed in the first group, the second category included four treatments (i.e., 1.0 mg/L 2,4-D + 0.1 mg/L BAP treatments, 0.1 mg/L 2,4-D + 0.3 mg/L BAP, 0.3 mg/L 2,4-D + 0.3 mg/L BAP, and 0.3 mg/L 2,4-D + 0.5 mg/L BAP), and the rest formed the third cluster. Regarding hairy root induction between R1000 and GM strains, no significant difference was observed for both hypocotyl (50.00 and 41.11%, respectively) and stem (50.95% and 57.94%, respectively), while for leaf, R1000 strain (59.23%) was superior compared to GM strain (38.33%). In addition, for the R1000 strain, no significant difference was observed among the three tissues, but for the GM strain, the stem tissue was more suitable.

Keywords: *Withania coagulans*; Hairy root; BAP; 2,4-D; Medicinal plant; Callus; *Agrobacterium rhizogenes*

An overview of the history and production routes of the anticancer drug Taxol *in vivo* and *in vitro*

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Abstract

Upon taxol identification as an anticancer drug by Wall and Wani in 1960s from inner bark of yew trees (*Taxus brevifolia*), this natural product was approved by the FDA in 1992 and 1994 as an important drug compound for the treatment of ovarian and breast cancers, respectively. The utility of taxol was gradually boosted in chemotherapy of various cancers alongside Alzheimer's and Parkinson's disease. Thus, taxol may be considered as the most important antitumor agent throughout history, with a global market value of 4.51 billion US dollars in 2021, and is expected to reach over US$ 11.16 billion by 2030. Due to the indiscriminate harvesting of the yew trees from the relevant habitats and subsequent environmental concerns, other naturally alternative methods such as hazelnut and endophytic fungi were introduced, albeit it could be also semi-synthetically produced from baccatin III. Callus culture and cell suspension, the use of various precursors/elicitors, followed by metabolic engineering of taxol biosynthetic pathway in microbial hosts (i.e., yeast and *Escherichia coli*) are other valuable options for biotechnological taxol production. On the other hand, one major problem related to taxol production is its purification, which is mainly based on various chromatographic methods. These approaches deal mostly with long and multi-step preparation steps, and some impurities may be observed in the final product (i.e., Taxol). To remove undesirable impurities, plant pigments, and tar/waxy substances in crude extract, pre-purification techniques using different absorbents (e.g., activated charcoal, celite, sylopute, charcoal, and silica/grapheme/iron nanoparticles) are utilized. Here, the history, mechanism of action, taxol production (*in vivo* and *in vitro*), recent advances in metabolite engineering of taxol biosynthetic pathway, and its pre-purification methods are described.

Keywords: Taxol; Yew trees; Anticancer drug; Plant secondary metabolite; Biotechnology

Effect of heavy metal stresses due to Nichel and Cadmium concentrations on extract composition of *Thymus persicus*

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Abstract

Thyme is one of the high consuming medicinal plant in Iran and *Thymus persicus* is an Iran endemic thyme species which grows in heavy metal contaminated areas of Zanjan province. In order to study of the effect of Nickel and Cadmium on the secondary compounds of *Thymus persicus*, seedlings were cultured in different concentrations of Ni and Cd: 0 (control), 0.2, .04 and 0.6 mM in a hydroponic culture system. Three weeks after treatment, the N-Hexane extract of aerial parts of plants at control and heavy metal stress treatments were analyzed using GC/MS. According to the results; thymol, thymoquinone, linalool and formic acid were the main components of the extract at the control treatment. The percentage of thymol increased at all Ni and Cd concentrations except for the 0.4 mM Ni, however; the amount of thymoquinone, linalool and formic acid decreased at all heavy metal treatments comparing to control. It can be suggested that Ni and Cd had different effects on extract composition in this plant. Some major compounds of extract increased and some decreased which showed unpredictable consequences.

Keywords: Extract, Cadmium, Heavy metals, Nichel, *Thymus persicus*.

In silico analysis of the predicted protein sequence of linalool synthase as a key enzyme in the biosynthesis of linalool compound in *Mentha citrata*

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Abstract

Linalool is one of the most important compounds in the essential oil of *Mentha citrate* which, in addition to its use in various food and pharmaceutical industries, as well as in the treatment of cancer, having antiproliferative properties. Two basic precursors IPP and DMAPP, after the formation of GPP, by the enzyme linalool synthase (Lins) (the key and final enzyme of the pathway) move towards the production of linalool compound. Phylogenetic tree was classified into 3 clusters. McLins was found associated with *Thymus vulgaris* followed by *Salvia miltiorrhiza*. In addition, based on InterProScan tool and pfam database, the putative amino acids sequence revealed more homology with conserved active site consensus sequence at the N terminus of a variety of plant diterpenoid biosynthetic enzyme to mediate magnesium ion binding and lyase activity. PROSITE motif results exhibited that McLins have two major motifs, Terpene_synth_C, Terpene synthase family, and metal binding domain. Results showed that deduced McLins protein was a predominantly α-helical protein, which mainly consisted of alpha helix (63.86%), random coils (26.24%), extended strands (6.60%), and 3.30% beta turns.

Key Words: linalool synthase (Lins); phylogenetic analysis; conserved domains; catalytic domains; motif prediction

A comparative study on the essential oil composition and antibacterial activities of different organs of wild growing Paeonia wendelboi Ruksans from Iran

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Abstract

Paeonia Paeonia wendelboi Ruksans is an herbaceous perennial and flowering plant from the Paeoniaceae family. In this research, the roots, stems, leaves and fruits of Paeonia wendelboi Ruksans were investigated for a comparative identification of essential oil composition. The essential oils constituents were identified by GC/MS and then compared. The study leads to the identification of 32, 58, 76, and 59y components in the essential oils obtained from the roots, stems, leaves and fruits, respectively. These chemicals make up more than 99.5% of the essential oil. Some of the identified compounds Salicylaldehyde ،n-Nonaldehyde ، Myrtanal ، 9 Octadecanone -1-ol, and n-tricosane) occurred in all parts of the plant. The existence of compounds such as Benzaldehyde ، Phenol Silphiperfol-5-en n-Heptanal cis Hept-2-enal in the fruit, stem, root, and leaf, respectively. The antibacterial activities (MIC) of the oils obtained from the four studied Paeonia parts against Escherichia coli and Staphylococcus aureus was studied. Staphylococcus aureus was the most sensitive microorganism to the oil obtained from the fruits of Paeonia wendelboi Ruksans with the value of 0.04±0.005mg mL1

Keywords: Paeonia, GC/MS, essential oil, antibacterial,

The effects of priming with polyamines and water in improving the characteristics of thyme sprouts and seedlings

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Abstract

Thyme is one of the native medicinal plants of Iran, which has a high medicinal value, but, like most medicinal plants, it has a weak initial growth. To help reduce this difficulty, the priming of thyme seeds with distilled water and polyamines was evaluated. In this study, dry seeds, seeds primed with distilled water, and seeds primed with putrescine, spermine, and spermidine in amounts of 30, 60, and 90 mM were treated on the seeds for 18 hours at a temperature of 24°C. In this regard, significant results were seen in improving the early growth stages. In such a way that characteristics such as germination percentage, germination rate, time spread of germination, size of different seedling organs, seedling growth rate, and fresh and dry weight of seedling were significantly improved. Among the examined polyamines, spermine and especially putrescine, at 60 mM levels, could achieve better results than other levels and compounds.

Keywords: putrescine, spermine, spermidine, distilled water, germination enzymes.

Antioxidant activity of cumin (*Cuminum cyminum* L.) and thyme (*Thymus vulgaris* L.) essential oils

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Abstract

Essential oils are complex components isolated from aromatic plants, encompass antioxidant activities, and utilized normally in food, cosmetic and pharmaceutical industries. In this study, antioxidant activities of essential oils from cumin (*Cuminum cyminum* L.) and thyme (*Thymus vulgaris* L.) were studied. For each plant, approximately 50 g of dried plant material was applied for essential oil extraction using water distillation method and Clevenger Apparatus (three replicates was utilized for each plant). The yield of essential oil for both plant species was calculated as 2%. Antioxidant activities of essential oils were investigated using two different methods of DPPH free radical inhibition and hydrogen peroxide (H_2O_2) inhibition assay. The results showed that antioxidant activity of cumin essential oil increased significantly in parallel with concentration growth, while antioxidant activity of thyme essential oil did not follow the same pattern. The highest concentration of cumin essential oil (25 µl/ml) had 28.57% inhibition of DPPH free radicals, while for thyme essential oil (25 µl/ml) inhibitory effect of DPPH free radicals was 95.86%. The highest inhibition effect of hydrogen peroxide was calculated as 60.96% for cumin essential oil (0.15 µl/ml) and 75.42% for thyme essential oil (0.13 µl/ml).

Keywords: Antioxidant, Essential oils, Cumin, Thyme, DPPH, H_2O_2

Effect of plant growth promoting rhizobacteria (PGPR)-assisted seed priming on the biochemical traits of Balango (*Lallemantia royleana*) at germination phase under drought stress

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Abstract

To evaluate the effect of plant growth promoting rhizobacteria (PGPR)-assisted seed priming on the biochemical traits of balango seedlings under drought stress, a factorial experiment was conducted based on a completely randomized design (CRD) with three replications at the physiological laboratory of Razi University over 2022-2023. Experimental factors consisted of mannitol-induced drought stress at four levels (i.e., zero, 10%, 20%, and 30%) and PGPRs pre-treatment at four levels (i.e., no bacterial priming as control, followed by three bacterial strains of *Bacillus pumilus* INR7, *Lysinibacillus boronitolerans RUPB71* and *Alcaligenes faecalis* 1624). The studied traits included total phenol content, total soluble sugar and total flavonoid content. Based on the results, the highest total soluble sugar (0.698 ppm) was obtained in the interaction between *B. pumilus* INR7 and drought level of 20%, while the maximum total phenol content (0.399 ppm) was acquired for the interaction of *A. faecalis* 1624 and drought level of 10%. Furthermore, Non- priming (control) at zero drought level (control) had the highest total flavonoid content (0.952µg). The results, overall, indicated that the use of PGPR was effective to moderate adverse effects of drought stress, possibly via modifications on the quantities of the aforesaid biochemical traits in Balango.

Keywords: Biochemical traits, Balango, Drought stress, Growth promoting rhizobacteria, Mannitol

Changes in the levels of ascorbate peroxidase and hydrogen peroxidase of *Thymus daenensis* Celak with the use of different mushrooms in different humidity conditions

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Abstract

The present study was conducted to investigate the effect of *Trichoderma* and *Piriformospora indica* fungi on the thyme plant's encounter with free radicals and also the changes in ascorbate peroxidase enzyme production. The experimental factors included no application of mushrooms, separate application of *Trichoderma* and *P. indica*, and the application of the combination of both mushrooms in humidity conditions of 90, 65, and 45% of the field capacity in 3 replications and as a factorial experiment. The amount of ascorbate peroxidase enzyme activity increased by 52.34, 49.56 and 56.06% respectively with the separate use of mushrooms and the mixture of these two mushrooms at 45% moisture stress compared to the treatment without the use of mushrooms at the same level. Also, it was found that the amount of hydrogen peroxide increased by 65% and 45% during moisture stress and the highest increase was seen in the treatment without mushroom inoculation and 45% moisture stress. Finally, the results of this research showed that the use of mushrooms reduced the amount of hydrogen peroxide, especially in the interaction of the 45% moisture stress treatment and the mixture of *P. indica* and *Trichoderma* mushrooms, as a result of which the side effects caused by hydrogen peroxide were reduced.

Key words: Thymus daenensis, Hydrogen peroxide, drought stress, Ascorbate peroxidase enzyme activity, fungus

Changes in stem length, chlorophyll a, b and carotenoids in *Thymus daenensis* Celak with the use of different mushrooms in different humidity conditions

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Abstract

In order to reduce the negative effects of drought stress in *Thymus daenensis* plant, a factorial experiment was conducted in the form of randomized complete block design. The fungal factor included the absence of mushroom use, the separate use of *Pirifirmispora indica* and *Trichoderma*, and the use of *P. indica* and *Trichoderma* combination, as well as the moisture stress factor included 90, 65 and 45% of the crop capacity. In this research, the application of all three levels of fungi in moisture conditions increased the crop capacity by 45%, 32.14, 33.68, and 56.25% of stem height, respectively, compared to the treatment without mushroom inoculation. Also, the amount of chlorophyll a and b, carotenoid in the conditions of no application of mushrooms and 45% moisture stress, had the lowest amount of activity, and in the treatment of the application of mushroom mixture in the condition of 90% moisture, the activity was the highest. According to the results of this research, it was revealed that the used mushrooms have the ability to stimulate growth and induce plant resistance, and despite the effect of moisture stress in reducing the height of the plant and the amount of pigments, the use of these mushrooms increases the resistance of thyme against it leads.

Key words: Thymus daenensis, Chlorophyll, Carotenoid, Drought stress, Fungus

Bioformulation of silver nanoparticles using *Nigella arvensis* leaf extract with Potential Bioactivity against *Klebsiella pneumonia*

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Abstract

The formulation of nanoparticles mediated medicinal plant extract is cost-effective, eco-friendly, stable and quicker than conventional methods. These nanoparticles particularly bioformulated silver nanoparticles (AgNPs) using plant extracts are the most effective against bacteria. Therefore, in the present study, we determined the antibacterial activity of *Nigella arvensis*-derived AgNPs (Na-AgNPs) against an antibiotic resistance *Klebsiella pneumonia* using agar well diffusion and minimum inhibitory concentration (MIC). According to results, the bioformulated Na-AgNPs showed a maximum inhibition zone of 14 mm and MIC value of 15.62 µg/mL against *K. pneumonia*. Therefore, bioformulated Na-AgNPs as an alternative to chemical antibacterial agents can be used to manage of infections in medicine and other industries.

Keywords *:* Antibacterial activity; Antibiotic resistance*;* bioformulation; *Klebsiella pneumonia*

Assesment of Phytochemical of the extract of six species of the medicinal plant Artemisia

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Abstract

Many extracts of medicinal plants are suitable alternatives for treating infections, and the medicinal properties of plants are related to the presence of secondary metabolites in them. Concerning the antioxidant activity of the Artemisia plant, this research aimed to investigate the biochemical characteristics of the extract of six species of the Artemisia plant from the chicory family. The experiment was conducted as a completely randomized design in three replications in the Laboratory Biotechnology of the Faculty of Agriculture. The traits studied in this research included the determination of total sugar, phenol, and flavonoid content after preparing the plant extract of the species. The results variance analysis of the studied traits of the species showed a significant difference at the probability level of 1%. In the average comparison results, Austrica and Touranfortiana showed the lowest (0.42) and the highest (0.502) mg/l phenol content, respectively. In comparing the quantity of soluble sugar and the number of flavonoids, the lowest amount (0.461 mg/liter and 1.194 micrograms) related to Scoparia species and the highest content of soluble sugar and flavonoid (0.681 mg/liter and 388 2.0 µg) was relevant Touranfortiana species. The results of the correlation between the examined traits also showed that the highest correlation (0.899) at the five percent probability level between the content of phenol and flavonoid was positive and significant, and there was a positive and significant correlation between the quantity of soluble sugar and total phenol. 0.812) was shown. Based on the results of the research, among the studied species, A. Touranfortiana species with more soluble sugar, total phenol, and flavonoid content can be used in more phytochemical studies to be introduced in large-scale cultivation.

The effect of different irrigation regimes on the number of flowering branches of peppermint under different light intensities

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Abstract

Environmental conditions and ecological factors play a significant role in the growth and performance of medicinal plants, which is the main factor in determining how plants adapt to environmental conditions. Climate change and the increasing light intensity and temperature has resulted in a decrease in water resources in field conditions, thus, plants become stressed. Plants are usually exposed to a combination of different abiotic stresses at different stages of their growth. The simultaneous occurrence of these environmental stresses is one of the most important factors affecting growth, performance, and quality of aromatic and medicinal plants, which affects the morphological state of the plants, especially those that flower, by disrupting the balance of the factors within the plant, and a flowering branch is one of the most important determinants of yield and quality for medicinal and aromatic plants. Among the Lamiaceae family, peppermint (*Mentha × piperita*) is the most important aromatic plant. For this purpose, a split plot experiment was studied in three replications using a random complete block design in two years to examine the effects of different levels of irrigation regimes on the number of flowering branches in peppermint under different light intensities. Experimental treatments included levels of different intensities of light (control (full sunlight), 75% sunlight and 50% sunlight) as the main factor and irrigation levels including the control (irrigation after depleting 25% of the field capacity (FC)), moderate stress (irrigation after 50% FC) and severe stress (irrigation after 75% of FC) as second factors. The results showed that, in the first year, the most flowering branches were obtained in the treatment without drought stress under 50% sunlight intensity (19.66 per plant) and in the second year and the average of two years, without water stress and under full sunlight intensity (24.33 per plant). While the lowest number of flowering branches were obtained in the first year under irrigation stress after depleting 75% of FC and full light intensity, in the second year, 75% of full sunlight with water stress. Also, the number of flowering branches was significantly higher in the second year compared to the first year in the mint plant in both years. In the first year, the decrease in light intensity caused the number of flowering branches to increase, but in the second year, it caused the number to decrease. Furthermore, it can be concluded that the mint plant is sensitive to high light intensity and water stress in the first year of cultivation. Mint in the first year of cultivation, it is less affected by the reduction in light intensity, and its branches produce more flowers.

Key words: Flowering branches, Irrigation, Light intensity, Mint.

The effect of salinity stress on some physiological traits and seed yield of Common buckwheat (*Fagopyrum esculentum*)

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Abstract

Common buckwheat (*Fagopyrum esculentum* Moench.) is the main member of the Polygonaceae family that its seeds contain rutin as an important phenolic compound. A pot study based on randomized complete block design with three replications was conducted to assay the effect of different level of salinity stress (0, 20, 40, and 60 mM NaCl) on physiological traits and seed yield of *F. esculentum*. The studied physiological traits were included photosynthesis pigments, water relative content, proline and total phenol content. The analysis variance showed that salinity stress significantly affected the studied traits. Salinity stress significantly decreased chlorophyll and carotenoids content so that the lowest contents of photosynthesis pigments were obtained under severe salinity (60 mM). Also the relative water content of common buckwheat decreased with increasing salinity levels by 42%, compared with non-stressed plants. Salinity stress increased proline content as the main osmolyte compounds up to 26%. Total phenol content of *F. esculentum* leaves was significantly enhanced in response to salinity and the highest phenol content was observed in severe salinity stressed plants. With increasing salinity from 20 mM up to 60 mM the harvested seed yield was considerably decreased. According to obtained results common buckwheat can resist the 20 mM NaCl without any reduction in photosynthesis pigments, relative water content and consequently seed yield.

Keyword: salinity stress, relative water content, phenol, osmolyte, seed yield

Construction of biosynthesized paramagnetic iron nanoparticle-based nanocarrier for gene delivery purposes to plant cell

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Abstract

Plant genetic engineering faced by challenges of biomolecules transfer in plant cells with the multi-layered and hard cell wall. Traditional biomolecules transfer approaches have serious limited. Advances in nanotechnology and nanoparticles have created promising to plant species-independent transfer of DNA, RNA, and proteins passively through cell wall. In this research, Superparamagnetic iron oxide nanoparticles (SPIONs) were synthesized in *Catharanthus roseus* leaf extracts that a rich medicinal plant in secondary metabolites. To characterized and confirmed the production of green synthesized SPIONPs TEM, XRD, FTIR, DLS, and VSM analyses, were done. The green synthesized SPIONs showed a single peak at 242 nm and spherical shape with 9.8 nm size. For nanocarrier organize, the green synthesized SPIONPs were successfully functionalized with a cationic polymer. This DNA@SPIONs could applied in many fields such as gene delivery to plant cells.

Key words: Functionalized iron oxide nanoparticles, Nanoparticles green synthesis, Nanoparticles surface functionalization, Plant biotechnology, Plant transformation.

CannOMICS: integrated omics approaches to put cannabis, cannabinoids and terpens data at work

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Abstract

Cannabis sativa L. (Cannabinaceae) is a multi-purpose plant with a long controversial history. Once we are talking about cannabis, the first thing that comes to mind is its recreational abuse. However, the share of this plant in food, medicine, fiber, and oil industries is even more than its drug market. The unique properties of cannabis/hemp can introduce this plant as a possible candidate to fight against new emerging diseases like COVID-19 and a possible candidate for cultivation on Mars. On December 2020, the UN Commission on Narcotic Drugs (CND), re-classified cannabis and cannabis resin under an international listing that recognizes its medical value. The cannabis legalization movement is gaining momentum across many countries; however, there are still big gaps in cannabis data. Filling these gaps provides a clearer horizon in front of researchers and cannabis lovers for the development of new medicinal, oil, fiber, and ornamental cannabis cultivars. Diverse cannabis populations and gene pools which include local varieties and landraces or even newly bred strains considered to be high potential resources to start pre-breeding and breeding programs towards introducing new cannabis and hemp cultivars or clones. Respect to high morphological, biochemical and genetic variation of thousands of accessions available across the world, scientists are able to create new hybrid lines or select clones using conventional and biotechnological approaches such as mutagenesis, gene and genome editing tools, and gene silencing technologies. Advances in genomics and functional genomics enabled genetic improvements in an efficient way through molecular breeding programs. Using integrative OMICS approaches in parallel with development of bioinformatics tools to analyze and integrate the data has improved the efficiency and robustness of breeding programs of cannabis. In this regard, CannOMICS deals with integrated omics approaches to put cannabis, cannabinoids and terpens data at work which consequently has a great impact on cannabis and hemp industry.

Keywords: Hemp, OMICS, Cannabinoids, Terpens, COVID-19, Mars

Medicinal plants: threats and conservation

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Abstract

Herbal products derived from medicinal plants (MPs), are universally valuable; but they are disappearing rapidly. Population growth, overexploitation, environmental destruction, illegal trade and unsound harvesting techniques are constantly threatening MPs resources, resulting in extinction. The purpose of this paper is to provide a trustworthy reference for the sustainable application and conservation of MPs resources and methodologies so that they can be implemented and conserved. In order to calculate for the sustainable application of MPs resources, both resource management (e.g. good sustainable use solutions and agricultural practices) and conservation strategies (e.g. in situ and ex situ cultivation) should be sufficiently taken into account. We recommend that biotechnical approaches (e.g. micro-propagation, tissue culture, molecular marker and synthetic seed technology based approaches) should be applied to ameliorate yield and shift the power of MPs.

Key words: Conservation, Herbs, Secondary metabolites, Environmental conditions

Effect of Abiotic Stresses on Secondary Metabolites of Purslane (*Portulaca oleracea* L.) Medicinal Plant with the Approach of Climate Change

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Abstract

Purslane is an annual medicinal plant with juicy leaves that is resistant to harsh environmental conditions. purslane can produce chemical reactions to stressful conditions. These chemicals are called secondary metabolites. Phytochemical investigations showed that this plant has a wide range of secondary metabolites including alkaloids, terpenoids, flavonoids and organic acids. high levels of these secondary metabolites allow purslane to grow in conditions that are very hostile to many other plants.The present study showed that combined stress causes more serious damage than single stress in purslane. Therefore, to survive, purslane has a high ability to deal with environmental stress conditions by activating metabolic pathways. We provide an overview of patterns of changes in metabolic pathways to abiotic stresses in purslane. This study helps us to understand the metabolic changes of purslane during abiotic stresses caused by climate change.

Keywords: purslane, abiotic stress, climate change, secondary metabolites.

Synergistic anticancer properties of hydro-alcoholic extract of lemon balm (*Melissa officinalis*) and graphene nanoparticle on HeLa cell line

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Abstract

Cancer is one of the important problems affecting public health worldwide. The use of medicinal plants and their effective compounds is an alternative solution to prevent and treat cancer. In the present research, the synergistic effects of lemon balm hydro-alcoholic extract and graphene nanoparticles on cervical cancer cells were investigated. Dilutions of 100 and 200 uM total phenolic compounds equivalent to gallic acid were prepared and the effect of these extract concentrations in combination with graphene nanoparticles (0, 50, 100 and 200 µg/ml) on the survival of Hela cancer cells was evaluated using the MTT assay. Based on the results, the treatment with lemon balm extract had a significant effect on reducing the cell survival ($p<0.05$). Addition of graphene nanoparticles to the plant extract only at a concentration of 200 µg/ml caused a significant reduction of cells in both concentrations of the extract compared to the treatment without graphene nanoparticles. In general, the hydro-alcoholic extract of lemon balm is able to prevent the growth of HeLa cells. On the other hand, synergistic anticancer effects were observed in the combination of plant extract and graphene nanoparticles, which can be a solution to increase the efficiency of medicinal plants to fight cancer cells.

Keywords: graphene, anti-cancer properties, lemon balm, HeLa cell line

Investigating the expression pattern of *bax* and *bcl-2* genes in Hela cancer cells treated with hydro-alcoholic extract of *Melissa officinalis* and graphene nanoparticles

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Abstract

Medicinal plants are a potentially valuable resource for the prevention and treatment of diseases such as various types of cancer. Lemon balm is rich in polyphenolic compounds and flavonoids with antioxidant and antiproliferative properties that can change the pattern of cell cycle in cancer cells. Bax and Bcl-2 proteins are involved in induction and inhibition of apoptosis, respectively. In this study, the expression pattern of *bax* and *bcl-2* genes in HeLa cancer cells treated with different concentrations of hydro-alcoholic extract of lemon balm (100 and 200 µg/ml) along with different concentrations of graphene nanoparticles (0, 50, 100 and 200 µg/ml) were investigated. Based on the results, lemon balm extract alone caused a significant increase in *bax* gene expression in treated cells compared to control. In the presence of graphene, the general pattern of gene expression increment remained constant. However, the combination of treatments, especially at the highest concentration of graphene (200 µg/ml), caused a 2.4-fold increase in *bax* gene expression compared to the control. On the other hand, lemon balm extract alone did not have significant effect on *bcl-2* gene expression, but in combination with graphene, a significant decrease in the expression of this gene was observed. The highest ratio of *bax*/*bcl-2* was observed in the 200 µg/ml lemon balm extract with 200 µg/ml graphene (11/05). In general, lemon balm extract is able to change the expression pattern of important genes involved in apoptosis regulation in HeLa cancer cells.

Keywords: gene expression, apoptosis, anti-cancer properties, lemon balm, HeLa cell line

Isolation, molecular identification and morphological and diversity of endophytic fungi from *Capparis spinosa* L.

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Abstract

Endophytes are microorganisms that spend at least one stage of their life cycle into plants without causing any symptoms. This study was conducted to identify and survey diversify of endophytic fungi in *Capparis spinosa*. Sampling was performed from 10 areas. Four healthy plants were selected from each region based on a systematic random sampling design and Samples were taken from different plant tissues (including leaves, stems, roots and fruits). After surface disinfection, the samples were placed on medium and the obtained fungal isolates were purified. Isolates were identified by sequencing ITS1-5.8S-ITS2. Totally, 72 isolates were obtained, which include 6 orders and 10 genera. Among isolates, 95.83% belonged to Ascomycota and they were divided into six orders, namely; Eurotiales, Sordariales, Pleosporales, Diaporthales, Hypocreales and Mucorales. In this study, *Alternaria* sp. and *Aspergillus tubingensis* had the highest abundance and about half of the endophytic fungi (49.25) were isolated from the two mountainous regions of Khodafarin (East Azerbaijan) and Ab-Bar (Zanjan) which it seems to be the presence of endophytic fungi in plants in colder and mountainous areas is more than others. Also, the total percentage of colonization was 11.25% and the highest percentage of colonization was seen in root tissue (50.00%) and the lowest in fruit tissue (4.17%), which can increase the probability of the effect of coexistence of soil fungi in the vicinity of the root. Among the isolated species, *Chaetomium globosum*, *Diaporthe foeniculina*, *Mucor circinelloides* and *Stemphyliu vesicarium* are reported for the first time from Iran for Caper, and fungal species identified for the first time in the world are reported as Caper endophytic fungi.

Keywords: Caper, Symbiotic Fungi, Biodiversity

Investigating the anticorrosive effect of catechin on iron

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Abstract

Catechin is present in many dietary products, plants, fruits (such as apples, blueberries, gooseberries, grape seeds, kiwi, strawberries), green tea, cacao liquor, chocolate, cocoa, etc. The antioxidant action of catechin is well-established by various *in vitro*, *in vivo* and physical methods. Catechin affects the molecular mechanisms involved in angiogenesis, extracellular matrix degradation, the regulation of cell death, and multidrug resistance in cancers and related disorders. A positive correlation between green tea consumption and cardiovascular health due to several actions such as antioxidative, antihypertensive, anti-inflammatory, antiproliferative, antithrombogenic, and anti-hyperlipidemic etc., is well established based upon epidemiological and experimental studies. Clinical studies have shown the beneficial effects of catechin due its antioxidant action. In this research, the effect of different concentrations of 1 M hydrochloric acid on the electrochemical properties and corrosion of iron was investigated. The experiments showed that catechin can have corrosion inhibition properties. The results obtained from the TOEFL tests of polarization, electrochemical impedance and weight loss showed favorable compliance. The highest inhibition percentage in TOEFL test was 32%, EIS test was 25% and weight loss was 18%. Catechin is a mixed inhibitor. The inhibitory effect of catechin was carried out by the absorption of the inhibitor at the metal-electrolyte interface, and the absorption mechanism follows the Langmuir isotherm. The activation energy of inhibitor adsorption was calculated to be -12.254 kj/mol, which shows that inhibitor adsorption is spontaneous in this system.

Key Words: catechin, electrochemical, toefl test , inhibitor, corrosion

Evaluation of the Influence of Priming Savory (*Satureja hortensis*) Seeds with Salicylic Acid Solution on Physiological Responses of Seedlings under Salt Stress.

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Abstract

Exogenously applied salicylic acid (SA) can mitigate the adverse effects of salt stress in plants. This study was carried out to evaluate the impact of priming savory (*Satureja hortensis*) seeds with SA on the physiological responses of this plant under salt stress in a completely randomized design with 3 replications. After surface disinfection, seeds were primed with SA solution (0 and 0.5 mM) for 18 hours, seeds were put on moistened filter paper in Petri dishes and transferred to the growth chamber (5 days), then seedlings were transferred to culture trays containing sterilized perlite and transferred to the greenhouse. The seedlings were irrigated with 1/4 Hoagland solution. After 7 days, salt treatment (0, 30, and 60 mM) was initiated by solving NaCl in nutrient solution. After one week, the plants were harvested. The results showed that the SA treatments increased the activity of catalase and peroxidase enzymes. In addition, total phenolic compounds, proline, and glutathione concentrations were significantly higher in treated seedlings and plants exposed to salinity than in control samples. Salicylic acid increased the ratio of potassium to sodium in roots and shoots. In conclusion, our results indicate that priming savory seeds with salicylic acid can improve growth under salt stress conditions.

Key words: Salicylic Acid, Salinity, Savory

the study of quercetin in its inhibitory role for Egfr enzyme in regards to cancer prevention

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Background: Epidermal growth factor receptor is a transmembrane protein which functions as a receptor for epidermal growth factor with an extracellular ligand. This receptor is counted as a type of tyrosine kinase receptor. Mutations in the genes responsible for these proteins are associated with the occurrence of many cancers, which are observed to be overexpressed in many cancers. Activation of EGFR signaling in cancer cells is directly related to increased cell proliferation, angiogenesis and metastasis. By using an inhibitor, we be able to prevent this overexpression. In this course, we will investigate the interaction of EGFR and quercetin, which is a plant flavonoid, in the role of an inhibitor.
Method: By means of Autodock software, the docking was preformed between EGFR (Pdb id:1m17) and quercetin - which its energy was optimized by Hyperchem software -. Grid box set on x=21.199 y=_1.222 z=54.264 and docking was performed with 100 run.

Result: EGFR's aminoacids that exist in hydrogen bonds with quercetin, include Asp831, Thy766, Met769 and Gln767. binding energy for this ligand was -6.68 kcal/mol.

Conclusion: quercetin is able to occupy the EGFR's active site and due to its inhibitory property, prevent its excessive activity;this results were achieve by bioinformatics study which is quick yield and inexpensive study.Its could reduce the cost of research although clinical studies are necessary to ensure the accuracy of this issue.

Keywords: Egfr Enzyme,quercetin,inhabitor,docking,cancer

Investigating the possibility of spring cultivation of black cumin (*Nigella sativa* L.) in Lorestan province

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Abstract

This research was conducted to investigate the possibility of spring cultivation of black cumin in the agricultural lands of Lorestan province using Geographical Information System (GIS) and Network Analysis Process (ANP). First, data of minimum, maximum and average temperatures during the years 2004 - 2018 was prepared and a raster layer of these factors was produced by GIS .Then, each layer was divided into four classes based on the climatic needs of black cumin, and the final layer of the potential of the region for black cumin cultivation was obtained by combining these layers, which were weighted with the help of ANP, and classified into four classes: highly suitable, suitable, semi-suitable and unsuitable. The final feasibility study showed that 678,301.29 ha (equivalent to 98.12%) of the total lands of Lorestan province had suitable conditions and 1805.94 ha (equivalent to 0.26%) had semi-suitable conditions for spring black cumin cultivation. A separate examination of temperature factors showed that the minimum, maximum and average temperatures in 73.69, 1.62 and 2.43%, respectively, by creating restrictions in the studied area, they reduced the potential of the land for black cumin cultivation. The result of this research indicates that the conditions for black cumin cultivation are available and by changing the planting date in each district of this province, the conditions for optimal use of land can be provided.

Keywords: temperature, black cumin, GIS, ANP

Application of *Catharanthus roseus* L. in Food Industry: A review

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Abstract

Parvansh with the scientific name *Catharanthus roseus* L. is native to the island of Madagascar which is cultivated in many tropical and subtropical regions. This plant is evergreen and has flowers with beautiful and varied colors from pink to purple. Parvansh has medicinal uses in Spain, United States, China, Africa, India and Southern Europe and in Iran. Parvansh cultivated in Khuzestan, Bushehr, Hormozgan, sistan and Baluchestan provinces and rarely in Tehran. Parvansh has antioxidant, anti-inflammatory, antimicrobial and anti-cancer properties. This plant has been introduced to treat diseases such as diabetes, blood pressure, asthma, constipation, cancer and menstrual problems. Parvansh has various chemical compounds such as carbohydrates, flavonoids, saponins, glycosides and alkaloids. More than 130 alkaloids have been identified in this plant which is used as medicine, flavoring and food additives, as well as pesticides. This plant has a significant antioxidant activity which has attracted the attention of food industry researchers to replace it with synthetic antioxidant compounds. One of the basic steps that affect the quantity and quality of bioactive compound isolation from plant sources is the type of extraction method. In this study, after the general introduction of Parvansh and its phytochemical compounds, some effective methods for extracting the bioactive compounds of this plant for use in the food industry will be investigated.

Key words: Parvanesh, Food industry, Antioxidant activity, Phytochemical compounds, Extraction.

Neuroprotective Effect of Naringin and Naringenin against Parkinson's disease: Mechanism of Action

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Background: Parkinson's disease (PD) is the second most common neurodegenerative disorder that affects at least 1% of the population over the age of 60 and is characterized by slow and progressive loss of dopaminergic neurons in the substantia nigra. Aggregation and deposition of α-synuclein, neuroinflammation, excitotoxicity, oxidative stress ،genetic mutations, and many other factors may contribute to PD-related neurodegeneration. Naringin and naringenin are two beneficial natural compounds belonging to citrus flavonoids that possess numerous biological and pharmacological properties, including strong anti-tumor, antiviral, antibacterial, anti-inflammatory, antioxidant, cardioprotective, and neuroprotective activities. Recent studies have shown that they provide neuroprotection against several neurodegenerative diseases, including PD. This review aims to explore these compounds' therapeutic and neuroprotective mechanisms in neurodegenerative disorders in the context of gene expression and signaling pathways, particularly in Parkinson's disease.

Methods: In this systematic review, we searched PubMed/Medline, Science Direct, Scopus, Google Scholar, and the Web of Science databases up until May 2022 and identified 125 papers for the search terms naringin, naringenin, neurodegeneration, neuroprotection, Parkinson's disease, and gene expression and signaling pathways. Among full-text articles assessed, only original articles that met eligibility criteria and investigated molecular mechanisms involved in the neuroprotection effects of these compounds were selected for further analysis.

Results: The evidence reviewed in the present study indicates that naringin and naringenin protect nigrostriatal dopaminergic neurons against neurodegeneration and oxidative damage through regulation of genes involved in apoptotic pathway(through the downregulation of Bax and overexpressed Bcl-2, inhibition of the phosphorylation of c-Jun N terminal kinase (JNK)/p38 and abrogating caspase 3) , neuroprotective effects (by the induction of neurotrophic factors such as brain-derived neurotrophic factor (BDNF) , glial cell line-derived neurotrophic factor (GDNF), and vascular endothelial growth factor), increasing the level of dopamine and its metabolites, overexpression of protective proteins (including parkin, PARK 7 protein (DJ1), tyrosine hydroxylase (TH) and C terminus Hsp70 interacting protein (CHIP)), decreasing the pro-inflammatory cytokines (TNFα and IL1β) and reducing neuroinflammation by decreasing the level of TNF-α and nuclear factor-κB (NF-κB) as well as suppression of microglial activation and the subsequent pro-inflammatory factors release.

Keywords: Flavonoids, Naringenin, Naringin, Neurodegeneration, Neuroprotection, Parkinson's disease

Investigation of osmopriming, hydropriming and salt stress treatments on seed germination and some morphological and physiological characteristics of marigold

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Abstract

In order to investigate the effect of osmopriming, hydropriming and salinity stress on seed germination and some morphological and physiological characteristics of marigold (*Calendulaofficinalis* L.), an experiment was conducted based on a randomized completely block design with three replications. In this experiment, priming at three levels including control, distilled water and potassium nitrate (KNO_3) as the main factor and salinity stress at four levels including control (no stress), 7.8, 15.6 and 23.4 dS/mNaCl solution was considered as a secondary factor. The results showed that the effect of different levels of priming and salinity stress on the examined traits (plant dry weight, flower dry weight, number of stems per plant, number of flowers per plant, flower diameter and germination percentage and speed) was significant. The highest percentage of germination, flower dry weight, plant dry weight, number of flowers per plant and number of stems were observed under potassium nitrate priming treatment and treatment without salt stress (control). Also, the highest germination rate and flower diameter were recorded in distilled water treatment without salt stress (control). The lowest of them was observed in the control treatment (without priming) and salinity stress of 23.4 dS/m. The interaction effect of different levels of priming and salinity stress was not significant in the examined traits.

Keywords: Seed germination, salinity stress, priming, medicinal plant, *Calendulaofficinalis*

Investigating the effect of the main composition of Ferula gummosa plant in the treatment of urinary tract infection

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Background: Ferula gummosa is a perennial herb of Ferula in the family Apiaceae. Its gum resin is called galbanum. In this study, the main active ingredient of Galbanum, Beta-pinene, has been identified as an inhibitor of DNA gyrase (KZN1) which is one of the main enzymes of Escherichia coli. Escherichia coli is one of the most common bacteria in causing urinary tract infection.

Methods: Molecular docking is a computational method to predict how two or more molecular structures fit together. The interactions between the compound and the active site of DNA gyrase enzyme were investigated using this technique. HyperChem, AutoDockTools and Discovery Studio software were used for designing the ligand, docking studies, viewing the connection details, and final analysis, respectively. Eventually, the bonds formed between the desired enzyme and Cocrystal were compared with the bonds formed between the enzyme and the investigated ligand.

Results: Beta-pinene has the ability to bind to the active site of KZN1 at the lowest binding energy level of -3.81 kcal/mol. Beta-pinene establishes hydrophobic bonds with several amino acids, including ASP73 and ASN46. The interactions with ASP73 and ASN46 were observed in the active site of KZN1 in its connection with the Cocrystal molecule, as well.

Conclusion: The compound studied in the molecular docking investigation is able to bind to the active site of the enzyme and occupy the same space as Cocrystal. Therefore, the efficacy of this compound can be analyzed for further studies *invitro* and *invivo.*

Keywords: urinary tract infection, molecular docking, Ferula gummosa plant, DNA gyrase, 1KZN, Beta-pinene

Investigating the interaction of FGF receptor with murine herbal compound

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Background: FGF (Fibroblast Growth Factor) receptor is a fibroblast growth factor receptor and is involved in the stages of angiogenesis of tumors (metastasis). Moringa is a fast-growing, drought-resistant plant from the Moringa family. Morein plant is rich in phytosterols such as stigma sterol, sitosterol and camp sterol and is used as antioxidant, anti-cancer and anti-diabetes. The aim of this study is to investigate the inhibitory effect of murine herbal compound on FGF receptor by molecular docking method.

Methods: In this study, Hyperchem, Discovery, Autogrid and Autodock tools software were used to investigate how compounds bind to the active site of the enzyme, draw the chemical structure of compounds, optimize energy, docking studies and final analyses.

Results: Our ligand had -5.05 kcal/mol for binding energy and 3 hydrogen bonds with amino acids ALA567, GLU534 and GLU565 in the active site. Favorable interactions with amino acid residues in the active site of the enzyme with cocrystal are: ALA567, GLY490 and GLU565.

Conclusion: Considering the relatively high effectiveness of murine herbal compounds in bioinformatics study, for additional investigations, the effect of these herbal compounds can be analyzed in invitro and invivo conditions.

Key words: Anticancer, FGFreceptor, inhibitor, murine plant, molecular binding

Theoretical investigation of the antioxidant property of catechin with DFT

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Abstract

Catechin is a flavan-3-ol, a type of secondary metabolite providing antioxidant roles in plants. It belongs to the subgroup of polyphenols called flavonoids. Electrochemical experiments show that (+)-catechin oxidation mechanism proceeds in sequential steps, related with the catechol and resorcinol groups and the oxidation is pH-dependent. The oxidation of the catechol 3',4'-dihydroxyl electron-donating groups occurs first, at very low positive potentials, and is a reversible reaction. The hydroxyl groups of the resorcinol moiety oxidised afterwards were shown to undergo an irreversible oxidation reaction[1]. Antioxidants such as catechin or ascorbic acid (vitamin C) terminate these chain reactions. Catechin is an important compound with many medicinal properties, one of its important properties is its antioxidant property, which has led to the widespread use of this compound. In this research, using computational chemistry, which generally solves chemistry problems using mathematical and theoretical principles, the structure of catechin using Gaussian 2003 software and through DFT density functional theory using B3LYP method and 6-311G** basis series And SCI-PCM and CPCM models were calculated to determine the solvent energy. Then, using the theoretically obtained Gibbs free energy physical chemistry relationships, it was converted into half-wave potential and the antioxidant property of catechin was investigated in solvents (ethanol, dimethyl sulfoxide and heptane). The half-wave potential values of catechin The highest amount was obtained with SCI-PCM and CPCM methods for ethanol solvent.The more negative the half-wave potential, the higher the antioxidant property.

Keywords: Catechin, flavan, Electrochemical, antioxidant, DFT

The effect of pot size and type of growing environment on greenhouse ginger production

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Abstract

Ginger is one of the oldest medicinal plants and spices in the Orient. This plant needs a lot of moisture, enough light and the right temperature during growth. The present study was conducted to investigate the possibility of growing ginger plants in pots as a factorial test in the form of a completely random design on 24 ginger plants in four replications, which included the size of the pot (pot diameter 35 cm and height 30 cm and pot diameter 45 cm and height 35 cm). and the type of culture medium was (sand, perlite and mixture of sand and perlite with equal ratio). To feed the plants, Hoagland nutrient solution was used daily and once every 6 hours. After growing the rhizomes in the culture media during the growth period, the morphological traits including growth length, plant height every 15 days, number of leaves, leaf length, leaf width, leaf length to width ratio were recorded in a period of 15 days. At the time of harvest, the number of buds was recorded. , the fresh and dry weight of the aerial part of the plants and rhizomes, the length and diameter of the rhizome, the ratio of the length to the diameter of the rhizome, the total ash of the rhizome, the amount of chlorophyll, polyphenol and flavonoids were recorded, and finally, ginger greenhouse cultivation with sand for 9 months, ginger greenhouse cultivation with perlite and sand in a period of 8 months and ginger cultivation was done with pure perlite in a period of 6 months with better quality and favorable growth.

Key words: ginger, pot size, factorial test, greenhouse method.

Improvement the Nutritional Value of Edible-Medicinal Mushroom *Pleurotus ostreatus* with Natural Enrichment of Vitamins

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Abstract

Edible mushroom because the ability to produce a wide range of compounds with nutritional and medicinal have value as a functional food are discussed. There is evidence that enrichment of edible mushroom in addition to increasing the nutritional value and therapeutic properties they can provide their nutritional needs and also be used to prevent and treatment certain diseases. In this research, the fruiting body of the edible-medicinal mushroom *Pleurotus ostreatus* was produced under controlled environmental and biological conditions for the biosynthesis of higher amounts of vitamins. After the formation and harvesting of the fruiting body of control and enriched edible mushrooms, the amount of biomass production and vitamins was determined. The results show that the amount of vitamins in the fruiting body of the enriched edible mushroom has increased significantly compared to the control sample. This increase or enrichment was observed for thiamine 20%, riboflavin 21%, niacin 38%, pyridoxine 31%, folic acid 201%, vitamin C 161% and vitamin D2 390%. These findings show that the natural enrichment of the edible-medicinal mushroom *P. ostreatus* improves its nutritional value. Furthermore, it can be used as a valuable functional food ingredient or dietary supplement in the diets of patients.

Keywords: Edible-medicinal mushroom, Nutritional value, Enrichment, Vitamins, Functional food, Dietary supplement

Support: This work was supported by the Department of Research and Development, Mah Pharmed Pharmaceutical Co., Esfahan, Iran.

Improvement the Biosynthesis and Production of Dietary Fibers, Chitin and Polysaccharides in Edible-Medicinal Mushroom *Pleurotus ostreatus* with the Properties of Natural Functional Food and Dietary Supplement

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Abstract

The culture medium is one of the most important effective parameters in the biosynthesis and production of nutrient and bioactive compounds of mushrooms. Accordingly, by optimization the culture media, it is possible to production of mushrooms with higher contents of nutrient and bioactive compounds. In this study, the effect of optimizing the culture medium of edible-medicinal mushroom *Pleurotus ostreatus* on the contents of production of dry fruiting body biomass, dietary fibers, chitin, and polysaccharides (as the important bioactive compounds of edible-medicinal mushrooms) was evaluated. The results showed that by optimizing the edible mushroom culture medium with wheat bran and malt extract, the contents of biosynthesis and production of soluble (from 2.94 ± 020 to 4.08 ± 0.24 g/100g DW), insoluble (from 5.77 ± 0.19 to 7.61 ± 0.16 g/100g DW), and total (from 8.71 ± 0.40 to 11.70 ± 0.38 g/100g DW) dietary fibers, chitin (from 0.856 ± 0.09 to 1.276 ± 0.14 g/100g DW), and polysaccharides (from 19.30 ± 0.79 to 39.55 ± 1.35 g/100g DW) significantly increased. These findings show that it is possible to increase the amount of biosynthesis and production of bioactive compounds of the edible-medicinal mushroom *P. ostreatus*. Furthermore, it can be used as a valuable functional food ingredient or dietary supplement in the diets of patients.

Keywords: Edible-medicinal mushroom, Culture medium, Biosynthesis, Dietary fibers, Chitin, Polysaccharides, Functional food, Dietary supplement

Investigating the antifungal effect of hydroalcoholic extract of turmeric (Curcuma longa L.) on Aspergillus flavus fungus

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Abstract:

Aspergillus is the most common cause of fungal infections of foreign origin. So far, more than 250 species of Aspergillus are known, of which only 4 species are of clinical importance, one of the most important of which is Aspergillus flavus. The prevalence of fungal diseases has been increasing in the last two decades, especially in people with immune system defects. On the other hand, there are many opportunistic fungal agents in the living environment and they can cause food and environmental pollution, so we should look for ways to reduce antifungal activity, especially in food. In this study, the antifungal activity of 5% aqueous and alcoholic extract of turmeric (Curcuma longa L.) was investigated during 10 days. Antifungal activity of extracts was done by Plate Agar Diffusion method. Each of the extracts were added in concentrations of 20, 200, 2000 microliters per 20 ml culture medium. In order to evaluate the antifungal activity of the extracts on Aspergillus flavus, SDS-PAGE HPLC was used. The results of SDS-PAGE showed that the production of Aspergillus flavus decreases by inhibiting the activity of protein production.

key words: Aspergillus flavus, turmeric, hydroalcoholic extract, antifungal activity

The Possible Future for Agricultural Products and Medicinal plants in Metaverse

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Abstract

The new concept of Metaverse seeks to create a virtual life, with similar goals of real life. Although its mechanism has not been well identified so far, according to the current data, it is apparent that some facilities such as VR and AR potentially can make a plural room for agricultural and medicinal plants aspects. This 4th generation technology could be in the rings of agricultural value chains, and establish a new understanding between user and chains, also between the planet and productivity and consumption. Theorizing this concept, this article tries to define the generalities of Metaverse technology, then it shows how this future tool can monitor human and agricultural products from pre-production stage to post-consumption phase; then it clarifies how man would be able to be a traveler of other sectors of surrounding ecosystems to find deeply out the consequences of every decision and action on other parts of the planet. Eventually, it will be described the importance of creating a "personal user metadata" in metaverse in order to solve the problems facing mankind, resulting in a simple solution despite a complex approach in bottom layers as what we may see in soil mechanism in the nature.

Keywords: Metaverse, Agricultural Products, Medicinal plants, Future

The effect of onion size on the quantitative and qualitative yield of saffron in the resort area of Haj sheikh Musa

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Introduction:

Saffron with the scientific name (Crocus sativus L) is a perennial and cold-resistant plant that grows through the saffron bulb and up to a height of 30 cm. The growing period of saffron depends on the growing areas. It starts from October with the beginning of flowering and the leaf growth. Its flowers are in autumn and winter until late spring. Monthly temperature changes and the difference between day and night temperature are the most important factors in regulating the flowering of this plant. The onion of this plant has a brown cover that protects it. From the middle of the bulb or the base of the stem, a number of narrow and long leaves come out. From the middle of the leaves, a flowering stem comes out that leads to one to three flowers. This plant has purple flowers with 6 petals. The flowers have 3 Stamen 1 pistil leading to stigma of three branches (more than three branches are sometimes present) are red to orange in color.The used part of this plant is the end of the cream and the three-branched stigma, which is known as saffron and has a fragrant color and smell, which is nicknamed red gold because of its great value.

Materials and Methods:

In order to investigate the effect of saffron onion size on the performance of saffron stigma, an experiment was conducted in 2019 in Haj Sheikh Musa Yalaqi Village, Babol County, Mazandaran Province. The experiment was performed as a complete randomized block with 2 replications. Onion size was considered in 2 levels (10 grams and 20 grams). Each experimental plot had 4 planting lines of 4 meters with a distance of 30 cm between the planting lines. The distance between the onions on the planting lines was 10 cm and the planting depth was 15 cm. The flowers were harvested in four times with an interval of 3 days, and after being transferred to the laboratory, the fresh weight of the flowers and the number of flowers were determined. Then, the wet weight of the stigma and the wet weight of the petals were measured by a digital scale with an accuracy of 0.001 grams, and then the dry weight was calculated after drying according to the agricultural standards of the country. After measuring the traits, the average of the treatments was compared using the LSD test at the 5% level and statistical analysis was done using SAS software.

Results and Discussion:

In this research, a significant difference was observed between the experimental treatments (large onion and medium onion) in terms of characteristics, flower wet yield, stigma dry yield and stigma wet yield, and the large onion treatment was better than the medium onion treatment with a significant difference, but In terms of the number of flowers, no significant difference was observed between the two research treatments. The production product of both research treatments was evaluated at the premium level in terms of quality.

The effect of Nanozeolite on morphological and physiological properties of *rosa damascene*

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Abstract

Damask rose is a plant with medicinal-industrial value, and its prominent trait is an adaptation to drought. In order to investigate the effect of drought stress on vegetative growth and physiological characteristics of Damask rose, a factorial potted experiment was conducted in a randomized complete block design with three replicates. Treatments include three levels of Nanozeolite and four Irrigation intervals, which were performed in a roofed space with sufficient light. After determining the field capacity and soil wilting point, the reference weight was determined in terms of field capacity and drought treatments were applied based on soil moisture. Various morphological factors, including diameter growth, seedling height, leaf number, leaf area, aerial and terrestrial biomass, were determined after applying stress. Statistical analysis of data was performed using EXCEL and SPSS software. The results indicated that the highest total plant weight and shoot dry weight were obtained in 10g Nanozeolite treatment and irrigation interval four days. The interaction effect of Nanozeolite and irrigation intervals on fresh and dry leaf weight was significant and reached its maximum in 10g Nanozeolite and irrigation interval four days treatments. Nanozeolite affected the number, length, volume, and dry weight of Damask rose root significantly, and consumption of 10g of Nanozeolite improved these traits. Irrigation intervals significantly affected all measured traits except shoot dry weight, the number of roots, plant height, and leaf relative water content. In general, it can be concluded that the use of Nanozeolite in low concentrations has improved growth indices and the application beyond the desired limit for the drought-tolerant Damask rose plant has adverse effects

Key words: Drought stress, vegetative growth, survival, rosa damascena

Investigation and identification of edible mushroom of Ferula assa-foetida

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Abstract

Mushrooms are from the family of fungi, which have existed on earth since the beginning of creation. Even before the first trees sprouted on earth, giant mushrooms 7 meters high and 90 centimeters wide formed the ancient landscape. According to the dictionary of fungi, a total of 97,330 species of fungi have been discovered, including slime molds, chromestan fungi, chytridias fungi, lichen-forming fungi, yeasts and molds. In today's world, mushrooms are a good source of mineral nutrients, which have high economic value, due to their high-quality proteins, vitamins, fibers, and medicinal properties. The chemical nature of bioactive compounds in this mushroom are: polysaccharides, lipopolysaccharides, proteins, peptides, glycoproteins, nucleosides, triterpenoids, lectins, lipids and their derivative. Oyster mushroom (Pleurotus spp.) is one of the types of edible mushrooms that accounted for 14.2% of the total world production of edible mushrooms in 1997.The genus Pleurotus comprise about 40 different species that are commonly referred to as “Oyster mushroom”. Among several species of this genus, Pleurotus ostreatus (P. ostreatus) is popularly consumed by all over the world due to their taste, flavor, high nutritional values and medicinal properties.Because of the presence of numerous nutritional compositions and various active ingredients in P. ostreatus, have been reported to have antidiabetic, antibacterial, anticholestrolic, antiarthritic, antioxidant, anticancer, eye health and antiviral activities.

Medicinal mushroom Ferula assa-foetida is one of the species of oyster mushroom that grows on the roots of Umbelliferae plants, especially the medicinal plant Ferula assa-foetida, which has many medicinal properties.Local people in the areas where Ferula assa-foetida grows, including the heights of Larestan city located in Fars province, collect mushrooms grown on the remains of Ferula assa-foetida roots. It seems that these mushrooms have many medicinal properties due to their growth in the compost bed of this plant species.In order to develop the cultivation of medicinal species of mushrooms, it is possible to cultivate these species in the substrate prepared from the compost of medicinal plant species and Ferula assa-foetida cultivation fields after the stages of gum harvesting.

Keywords: *Pleurotus ostreatus*, Ferula assa-foetida, functional food, medicinal properties

Investigation of secondary metabolites of saffron in different biological stages of growth in organic conditions

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Abstract

Saffron, with the scientific name Crocus sativus L, is a monocotyledonous and perennial plant, herb without aerial stem and corms, belonging to the Iridaceae family. which has always been interesting for its medicinal and medicinal properties. Dry stigma (saffron) is usually used as food coloring, flavoring and medicine. The qualitative value of saffron is due to the presence of the main secondary metabolites and their derivatives, which include several beta-carotenes, including the yellow compounds crocin (crocin) responsible for the color of saffron, bitter substances picrocrocin (picrocrocin) responsible for the bitter taste of saffron and saffranal (saffranal) responsible for the aroma. And its smell is not only effective in reducing blood sugar, but also has anti-inflammatory and antioxidant properties. Considering that the medicinal properties of plants are created by their secondary metabolites, and the importance of the production of plant secondary metabolites, the present study, with the aim of investigating the secondary metabolites of saffron and the effect of plant age on the amount of production of these metabolites in completely organic conditions and The same was done in the medicinal plant nursery of Zanjan University, in order to determine the best biological age for the production of secondary metabolites for the saffron plant. In this research, techniques and methods such as spectrophotometry and chromatography, such as gas chromatography coupled to mass spectrometry (GC MS), were used to measure the amount of secondary metabolites and determine their structure.. Examining the results of the analysis of three compounds, crocin, picrocrocin, and safranal in three fields with different ages of one year, two years, and five years shows that the lowest amount of crocin is for the first year and the highest is for the fifth year, the lowest amount of picrocrocin is for the year The fifth and the highest is related to the first year, in the case of safranal, the amount of safranal increases with age, that is, the lowest amount for the first year and the highest amount of safranal is related to the fifth year. The results of this research show that we can use the different biological growth ages of this plant to obtain each of these main metabolites. These results are reported for the first time in saffron.

Key words: phytochemical, secondary metabolites, crocin, picrocrocin, safranal.

Bactericidal effects of biosynthetic silver nanoparticles from a medicinal plant against multidrug-resistant *Acinetobacter baumannii*

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Abstract

Antimicrobial-resistant bacterial strains cause serious infections that can lead to increased mortality and morbidity rates, longer hospital stays, and financial losses .Finding new bactericidal agents against these bacterial is a critical concern. Silver nanoparticles (AgNPs) as an excellent antibacterial agent can play an effective role against these bacteria. Therefore, in the present study, biosynthesized AgNPs using leaf infusion of *Dracocephalum kotschyi* Boiss were used to assess their bactericidal effects against a multidrug-resistant (MDR) *Acinetobacter baumannii* (a gram-negative strain). Based on the obtained results, the maximum zone of inhibition was 16 mm and the minimal inhibitory concentration (MIC) of biosynthesized AgNPs was 15.62 µg/mL against MDR *A. baumannii*. Therefore, biosynthesized AgNPs as cost-effective, eco-friendly, and safe alternative material with excellent bactericidal effect can be used in different fields such medical and food industries.

Keywords *Acinetobacter baumannii* ; AgNPs;**:** Bactericidal effect; Biosynthesis

Application of pre-treatment technique in seed preparation for germination under abiotic stress for sustainable agriculture.

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Abstract

Environmental stresses, especially salinity and drought stress, cause a decrease agriculture production worldwide more. Salinity damage in plants is through the effect on water absorption, the effect of ion toxicity and disturbance in the absorption of nutrients. Germination is one of the important and essential steps in the life of most plants, and tolerance to salinity is extremely important for the germination, greening and establishment of plants that grow in saline soils. The use of appropriate methods for seed preparation against adverse conditions is considered as a solution to reduce the negative effects of environmental stress on the plant and improve yield. One of the methods that has received special attention today is the seed priming technique. Seed priming is one of the seed pretreatment methods that improves seed performance and leads to faster and uniform germination. The most common priming methods include hydro-priming and osmo-priming. Osmo-priming is a special type of seed preparation before planting, which is done by soaking the seeds in solutions with low osmotic potential containing chemicals. Since medicinal plant in germination is sensitive to salinity and drought, it may not have uniform germination and favorable establishment in agricultural soils of the Iran country due to salinity. This research has been done in a library-review method so that by using different sources, effective solutions can be found in the development of the cultivation of these valuable medicinal plants in the natural and agricultural fields. The results of the research showed that in recent years, many researches have been conducted on the priming of medicinal plant seeds under stress conditions. According to research results, priming is effective in increasing the percentage and uniformity of seed germination and improving seedling growth and seed germination index. It has been reported that the priming method allows early DNA transcription, increases RNA and protein synthetase to seeds and increases embryo growth. Also, by repairing the damaged parts of the seeds, the excretion of metabolites decreases. As a result, priming treatments are effective in both natural and stressful conditions

Kay Words: priming, germination percentage, germination uniformity, salinity stress, conservation of genetic resources.

Effects of salicylic acid on reducing alkalinity stress in medicinal plants

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Abstract

In order to improve the quantitative and qualitative growth of medicinal plants, various plant regulators are used today. One of the growth regulators is salicylic acid or ortho-hydroxybenzoic acid, which is part of phytohormones and is produced by root cells. This phenolic compound, in addition to its central role in various physiological processes such as growth, photosynthesis and germination, has a key role in oxidative activities, respiration, absorption, ion transport and the activity of some enzymes. On the other hand, alkalinity stress causes ionic imbalance and disturbances in the absorption and transfer of nutrients in plants. In the present research, the effect of salicylic acid foliar spray in reducing alkalinity stress in some medicinal plants has been investigated. In general, the review of the materials shows that the use of salicylic acid solution is a suitable and economical method to improve the growth of medicinal plants under alkalinity stress conditions.

Keywords: Alkalinity stress, Morphological characteristics, Salicylic acid

The effects of humic acid application in reducing alkalinity stress in medicinal plants

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Abstract

In recent decades, the use of medicinal plants in developing countries has increased due to their efficacy and relative safety, as well as their cheap availability. In the conditions of alkalinity stress, plants must be able to maintain the internal ion balance in order to overcome physiological dryness and ion toxicity. One of the ways to reduce the effects of this stress is the use of plant growth regulators such as humic acid. Humic acid is a natural organic polymer compound that is formed as a result of the decay of organic materials. Considering the reduction of growth indicators as a result of physiological processes caused by alkalinity stress, the use of humic acid in the soil can be effective in the direction of sustainable agriculture and reducing the effects of stress. In this research, the effects of humic acid application in reducing alkalinity stress in some medicinal plants have been investigated.

Keywords: Alkalinity stress, Humic acid, Physiological characteristics .

The effect of management methods and chemical control on weeds in Dragon's Head (*Lallemantia iberica* Fischer & C.A. Meyer)

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Abstract

One of the most important factors in the production of medicinal plants is weed control. Therefore, in order to investigate the effect of different management methods and chemical control on weed management dragon's head (*Lallemantia iberica* Fischer & C.A. Meyer) an experiment was conducted in the research farm of the Faculty of Agriculture, University of Tabriz. Experiment was performed as a split-plot in randomized complete block design with three replications. Dragon's head was considered as the main plant and straw mulch, Hairy vetch (*Vica villosa* roth), Lentil (*Lens esculinaris*), Barley (*Hordeum vulgare* L.) and Bitter Vetch (*Vicia ervilia*) were cover plants as the sub plant. The results of analysis of variance showed that the effect of using treflan herbicide and weed management methods and the interaction between them was significant at 1% level. Among different treatments, the lowest weed density was obtained in the treatment of no weeding pure dragon's head with the use of treflan and the treatment of dragon's head + hairy vetch with the use and non-use of treflan. Also, the lowest dry weight of weeds was observed from the treatment of dragon's head + hairy vetch without use of treflan and dragon's head + barley and lentils with the use of treflan.

Keywords: Treflan, Weed, Cover crop, Management.

The effect of medicinal plants on environmental protection and sustainable agricultural development

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Abstract

Considering the importance and climatic conditions of Iran, which covers a large area of dry areas, the importance of environmental protection and sustainable development of agriculture can be realized. Certain plant species grow in these areas, which are remarkable both in terms of compatibility and ecology, as well as medicinally. Climate diversity and different ecological conditions have caused the diversity and richness of medicinal plants throughout Iran. According to the trend of water scarcity and drought crisis in the country, especially in arid and semi-arid regions, it is possible to manage the development of sustainable agriculture by observing the biological ecological cycle and protecting the environment and natural resources with special techniques in these regions. and created employment and economic prosperity. One of these techniques is the use of planting medicinal, aromatic and ornamental plants resistant to dehydration. Fortunately, in recent years, many efforts have been made to comprehensively understand the use of medicinal, aromatic and ornamental plants in terms of the type of plants, their distribution in Iran, ecological conditions, medicinal and food uses, extraction, analysis, identification of substances. Effectively, cultivating and domesticating, improving important species, investigating new methods to increase effective substances and studying medicinal effects, as well as studying and identifying and improving important ornamental and pasture species in arid and semi-arid areas, which contribute to the development of sustainable and healthy agriculture. The environment has helped a lot and interesting results have been achieved.

Keywords: Medicinal plants, Sustainable agriculture, Environment

Investigating the edaphic properties of *Salvia macrosiphon* in different natural habitats of Hormozgan Province

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Salvia macrosiphon is one of the valuable genus of *Salvia* which belongs to Lamiaceae family. It has 57 species in different habitats in Iran. In case of exploiting and introducing a wild medicinal species into agriculture and industry, it is necessary to study its various aspects, including the evaluation of the amount of the high-consumption and the micronutrient elements in the soil under the conditions of natural habitats. In this regard, from three natural habitats of *S. macrosiphon* plant in Hormozgan province including Bokhon, Sirmand and Zadmahmoud, soil samples were taken from the environment around the roots from a depth of 0-30 cm with three replicates. The samples were transferred to the Soil Science Laboratory of the Soil Science and Engineering Department of University of Tehran to analyze different physical and chemical characteristics of them. Results demonstrated that it had significant differences in amount of the high-consumption and the micronutrient elements among studied habitats. In current research, with the change of the soil texture of the studied habitats from silty loam to loamy, the accumulation of the high-consumption and the micronutrient elements in the soil samples fluctuated. Some soil features such as pH and Ec showed significant differences among habitats.

Keywords: Hormozgan province, Nutrient elements, Natural habitat, *Salvia macrosiphon*

Study on quantitative characteristica of essential oil of *Salvia macrosiphon* in different natural habitats of Fars Province

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Salvia macrosiphon is one of the valuable medicinal species which belongs to Lamiaceae family and grows wild in different regions of Iran. The secondary metabolites, which found in medicinal and aromatic plants, in different natural habitats are influenced by different geographical factors including climate. Due to the importance of *S. macrosiphon* in terms of its medicinal properties, and on the other hand, the successive droughts of the past and the indiscriminate harvesting of nature, indiscriminate grazing, have caused the loss of this valuable medicinal plant species. The aim of the present study is to identify the distribution areas and evaluate the quantitative yield of the essential oil in different habitats of *S. macrosiphon* in order to determine the best habitat(s) to continue the domestication process. In the current study, the aerial parts of this plant were collected at full flowering stage from five habitats in Fars province including Kazeroun, Farashband, Dehrom, Jahrom and Evaz. After confirmation of scientific names of the species, the plant materials were dried at shade and at room temperature and the essential oils were obtained by hydro-distillation according to British Pharmacopeia. Results showed that maximum and minimum essential oil contents (w/w%) obtained from Kazeroun (0.13%) and Farashband (0.06%) ecotypes, respectively. Generally, the results showed that *S. macrosiphon* ecotype in Kazeroun habitat has a high percentage of essential oil and can be used in breeding and domestication programs.

Keywords: Essential oil, Phytochemical variability, Natural habitat, *Salvia macrosiphon*

Evaluation of the total antioxidant capacity by Ferric Reducing Antioxidant Power (FRAP) method in the extracts of *Gundelia tournefortii* medicinal plant

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Abstract

Gundelia tournefortii is one of the medicinal and edible species belonging to the Asteraceae (Compositae) family, which is distributed in different parts of Iran. In this study, the aerial parts of *Gundelia tournefortii* were collected from Maragheh county, East Azerbaijan. The aim of the present study is to measure the total antioxidant capacity by FRAP method for samples extracted with 4 solvents: ethanol 50%, methanol 80%, acetone 70%, and water. The results showed that there are statistically significant differences between *Gundelia tournefortii* extracts in terms of total antioxidant capacity. The highest amount of total antioxidant capacity is related to the samples extracted with methanol 80%. In general, the findings of this research showed that the type of solvent used to extract of *Gundelia tournefortii* compounds has an effect on the antioxidant capacity. Conducting research on the antioxidant indices of valuable medicinal and edible plants used in the country can provide valuable information for the possible use of these plants in the pharmaceutical industry.

Key Words : Asteraceae, Antioxidant capacity, Extract, *Gundelia tournefortii*, Medicinal Plants

A review on the existing standards in the field of medicinal plants, their strengths and weaknesses, relying on the peppermint standard

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Abstract

National Document of Medicinal Plants and Traditional Medicine "Revision, modification, simplification and updating of laws, regulations and standards related to medicinal plants and herbal products" has been introduced as the first strategy. In the meantime, standard codification and its compliance play a very fundamental and key role in the quality of medicinal plants and their products. The preparation and codification of national standards for medicinal plant products and their export and import and submission to competent authorities for approval is also stated as an action in this national document. In this article, the need for standard codification, the competent authorities for codification, publication and implementation of standards will be introduced, then the existing standards in the field of medicinal-agricultural plants and plants exploited from natural resources, the standard of reproductive organs, the standard of rose water and perfumes, and the standard of essential oils, will be introduced. In the following, the results of the codification of the peppermint standard in the Research Institute of Forests and Ranglands will be presented. In line with the codification of peppermint plant standards and examining the range of changes in morphological traits, leaf anatomy, yield of shoot, percentage of essential oil, yield of essential oil, absorption rate of macro and micro elements, as well as the amount of pollution (absorption) to some heavy metals, peppermint were sampled from farms of Major producers from different provinces of Iran and analyzed in the full flowering stage, in the form of a completely random design with 3 replications. The results showed that there is a difference between different accessions in all morphological traits, yield of fresh and dry shoot, percentage and yield of essential oil, all essential oil compounds, macro and micro elements, heavy metals cadmium, lead, chromium, nickel and some physical characteristics and leaf anatomy. There was significance at the 1% level. The comparison of averages showed that the highest yield of dry shoot (3410 kg/ha) was obtained from Karaj accession. The highest percentage of essential oil with 2.36% and 2.31% belonged to Khosrowshahr and Zanjan. The highest yield of essential oil with 68.5 and 56.01 kg per hectare belonged to Khosrowshahr and Zanjan peppermint accessions, respectively.

Key words: plant standard, reproductive organs standard, heavy metals

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Introduction of some suitable agricultural species of Nepeta genus for different provinces of the country

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Abstract

In this project, the seeds of the available accessions of 12 species of *Nepeta assurgens*, *Nepeta cephalotes*, *Nepeta crassifolia*, *Nepeta pogonosperma*, *Nepeta eremokomos*, *Nepeta mahanensis*, *Nepeta bornmulleri*, *Nepeta cataria*, *Nepeta meyeri*, *Nepeta racemosa*, *Nepeta kotchyi*, *Nepeta mirzayanii*, was collected from different habitats. Then this research was carried out in the provinces of Alborz, Semnan, Isfahan, Kerman and West Azarbaijan in the form of randomized complete blocks in 3 replications in field conditions for a period of 4 years. Statistics were different in different provinces according to the establishment of species. The results of each province were as follows. The results of mean comparing of measured traits in three years of Alborz province showed that the *N. cataria* of the institution, year 2019, had the highest dry weight of a single plant (120.4 grams), yield per hectare (7951.2 kg) and essential oil yield (100.7 kg per hectare). In terms of all agronomic traits, yield and perenniality, *N. cataria* was the most suitable species among all the studied species in Alborz province. The results of Semnan province showed that the highest yield of the total aerial parts with 3236.43 and 3791.74 kg per hectare belonged to Gilan (Lushan) ecotype and then the institution ecotype of *N.cataria*. *N. pogonosperma* was also ranked next with 2229.44 kg/ha. The production yield of *N. catari* species and then *N. pogonosperma* species was significant compared to other species and they can be recommended as valuable species for further breeding and crop studies in the province. The results of Isfahan province showed that the highest yield of the total shoot belongs to the *Nepeta cataria*, especially the genotypes of Institute and Lushan, respectively, with average values of 1611 and 1945 kg of dry weight per hectare in the first year and 11710 and 9821 kg of dry weight per hectare in the second year. According to the obtained results, the superiority of *Nepeta cataria* species production compared to other species was remarkable and it can be recommended as a valuable species for production with medicinal purposes. In Kerman province, among the tested species in the second year of the experiment, 4 species (*N. racemosa*, *N. cataria*, *N. meyeri* Azarbayjan, *N. assurgens*) continued to grow and develop. *N. cataria* was significantly superior to other Nepta species in terms of yield and dry matter. So that it had the highest fresh weight (366.6 grams per plant) and dry weight (116.5 grams per plant). *N. cataria* species can be recommended as a valuable species in the region due to its high adaptability and superior performance compared to other studied species. The results of West Azarbaijan province showed that in the three-year analysis, the highest yield of the total aerial parts belonged to the Iranian species of Isfahan and Alamut, with average values of 1779 and 1127 kg of dry weight per hectare respectively. In the years 2016 and 2018, the *N. cataria* had the highest dry weight yield with 2532 kg per hectare per year. In general, according to the obtained results, the superiority of the production performance of *N. cataria* compared to other species was significant. The results of the analysis of all species in all provinces in different years showed that among the different species examined in terms of height, yield of shoot and yield of essential oil, *Nepeta cataria* originating from the institute and then the same species from Gilan province were the most successful species in the provinces. In terms of essential oil percentage, *N. kotschyi* is considered the best species among all species.

Key words: Nepta, adaptation, yield, climate, morphology

Changes in the essential oil and antioxidant activity of the *Echinacea purpurea* L. in response to different nutritional treatments

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Abstract

Echinacea purpurea L. is a perennial herbaceous plant from Asteraceae family, native to the eastern and central of United States. Antibacterial, antiviral, antioxidant and anti-cancer properties and increase the strength of the immune system against pathogens of this plant have been proven. The environmental and health costs of chemical fertilizers have led researchers to meet the nutritional needs of plants using organic and biological fertilizers. Therefore, the present study was conducted to investigate the effects of organic and biological fertilizers on Antioxidant activity and yield and composition of essential oil of *E. purpurea*. Treatments included Nitrogen, Phosphorus and Potassium (NPK) ($N_{50}P_{25}K_{25}$; $N_{75}P_{35}K_{35}$ and $N_{100}P_{35}K_{35}$ kg/ha), manure (30, 60 and 90 ton/ha), vermicompost (5, 10 and 15 ton/ha), $N_{50}P_{25}K_{25}$ fertilizer with 30 ton/ha manure, $N_{50}P_{25}K_{25}$ with 5 ton/ha vermicompost, biological fertilizers including *Glomus. intraradaices* + *G. mosseae*, *Azopirillum* + *Pseudomonas*, *Thiobacillus* with 5 ton per hectare vermicompost and *Thiobacillus* with 250 kg per hectare of sulfur. The highest activity of SOD (63.5 units/g fresh weight) was observed in the combined treatment of *Azospirillum* + Pseudomonas. Soil inoculation with *Azospirillum* + *Pseudomonas* had the greatest effect on POD activity (1.05 units per gram of fresh weight). Different amounts of vermicompost increased the activity of APX and CAT in Echinacea leaves (57.14 and 10.45 units per gram of fresh weight), respectively. The highest PPO activity (0.822 units/g fresh weight) was obtained in N100P75K75. In the first and second year of cultivation, the highest flower yield of *Echinacea* essential oil was obtained in the N50P25K25 + 30 tons per hectare of manure (N50P25K25+manure-30) with 11.7 and 7.16 kg per hectare, respectively. In the study of Echinacea essential oil, 31 compounds were identified, which indicated that Germacren was the most dominant component of the essential oil in the first year, and Germacren and Bergamot in the second year. The highest amount of Germacren was recorded in the first year in N50P25K25 fertilizer and in the second year in NPK + 30 tons.

Key words: Nutrition, Biofertilizer, Superoxide dismutase, Germacrene

Economic estimation of the production and yield of the *Hyssopus officinalis* L. in rainfed conditions (Damavand)

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Abstract

One of the most important issues facing agriculture, especially in hot and dry regions of the world, including Iran, is the problem of water shortage. Therefore, the approach towards drought-resistant plants is one of the basic and necessary programs in these areas. This research aims to produce and optimize suitable patterns for the cultivation of the valuable species of *Hyssopus officinalis* L. in the Damavand region as a research-promotional pilot in the area of 3000 m^2 in the research station with a density of 50000 plants per hectare in Homand Absard in Crop years 2017-2021 were implemented. In this project, in order to reach the production potential of hyssop in the rainfed conditions of Damavand region, based on the researches in this station and some other regions, by consuming 25 tons of manure per hectare along with 45 and 60 kilograms per hectare of urea and superphosphate, quantitative and qualitative yield of hyssop was investigated. The height of the plant (36.9 cm) and the canopy (51 x 51.2 cm) were measured, and then the yield of the shoot, the percentage of essential oil and its compounds, and finally the economic estimation of the plant was investigated. The implementation of the hyssop plant pilot in Damavand-Absard rainfed climate during the years of project shows the establishment of 80% of the transplanted. The average essential oil in four years of economic growth of the plant was 0.6%. The highest amount of essential oil was measured with 0.68% in the fourth year, which was an increase of about 30% compared to the first year. In the essential oil of hyssop, 18 compounds were found, which constituted 99.3% of the essential oil. The most important components of the essential oil were cis pinocamphone (40%) and trans pinocamphone (30%). The average yield of dry flowering hyssop in pilot rain was 2500 kg/ha. Taking into account the price of 70,000 Tomans (in 2021) for each kilogram of dried flowering branches, the income of Pilot Dam Hyssop will be 175 million Tomans per hectare. According to the yield of hyssop (2500 kg/ha) in the third year, the "economic year of plant growth" compared to the annual yield of wheat (800 kg/ha), the rainfed cultivation of the hyssop as a perennial medicinal plant compared to the crop cultivation of wheat according to the present climatic conditions, (decrease and non-uniformity in effective rainfall), can provide high economic benefits to farmers and users of suitable areas for the cultivation of this plant with medicinal value.

key words: Economic production, Low rainfall, Hyssop

Evaluation Of Different Amounts of Gibberellin And Auxin Hormones On Compatibility And Quantitative And Qualitative Characteristics Of Ginger (*Zingiber officinale*)

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Abstract

Ginger with the scientific name (*Zingiber officinale*, Rosc.) is one of the most important and oldest spice products in the world, which grows mainly in Central Asia and is exported to all over the world. Since the ginger plant has become one of the most widely used medicinal plants in recent years, and all the ginger consumed is imported from China and India, and until now, the cultivation of the ginger plant in Iran has not been carried out on a large scale. Therefore, in this research, the cultivation conditions of this plant have been investigated in Iran, and if it is compatible, it is possible to prevent foreign exchange from leaving the country every year. Also, in order to investigate the effect of different amounts of gibberellin and auxin hormones on the adaptability and quantitative and qualitative characteristics of research ginger plants in two sections of the seed technology laboratory and the educational and research greenhouse of the Department of Agriculture and Plant Breeding, Abu Rayhan Campus, University of Tehran located in Pakdasht in 2019-2021 was implemented. In this test, auxin hormone (indole acetic acid) at three levels of zero (control), 75 and 150 ppm which are labeled with the letters A_0, A_1 and A_2, and gibberellic acid hormone (GA_3) at four levels of zero (control), 75, 150 and 225 ppm and are shown with English letters G_0, G_1, G_2 and G_3 in this research. The experiment was conducted as a factorial in the form of a completely randomized block design in 3 replications. The results of the variance analysis of the weight of the rhizomes produced by the treatments used compared to the control showed a significant difference at the 5% level.

Keywords: Ginger, Hormone, Auxin, Gibberellin, Rhizome

The reaction of two species; *Nepeta denudate* Benth. and *Nepeta crassifolia* Boiss & Buhse. to stratification and planting density

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Abstract

Nepeta is one of the most important genus of lamiaceae. 79 species of the Nepeta genus have been reported in Iran. The results of some researches have shown that the species belonging to the lamiaceae family have high levels of phenol and antioxidants and some of them are rich in terpenes .Nepeta is used in traditional medicine as a disinfectant and astringent. This plant is a treatment for skin itches in children and also cures snake and scorpion bites. The important therapeutic properties of Nepeta genus are its sedative properties due to the presence of nepetalactone. According to the researches, in many species of Nepeta, including *Nepeta pogonosperma*, *N. crispa*, *N. mahanensis*, *N. ispahanica*, *N. eremophila* and *N. rivularis*, isomers of nepetalactone or 1,8-cineol have the highest percentage in essential oil. In order to investigate the possibility of cultivation and economic production of *Nepeta denudate* Benth and *Nepeta crassifolia*, the effect of seed stratification treatments and planting density on growth characteristics and plant quality was investigated at the Research Institute of forests and rangelands under field conditions. This research was carried out factorial in the form of randomized complete block design with 3 replications. The stratification factor of seeds before planting in two levels without stratification and stratification at 4°C for 4 weeks and planting density for both species was 40,000 and 66,000 seeds per hectare. The results of variance analysis of *N. denudata* species showed that the effect of planting density was significant at the level of 1% on the yield of shoot and at the level of 5% on the yield of essential oil. The highest shoot yield and essential oil yield were obtained in stratification treatment with 582.3 and 3.9 kg per hectare respectively .The results of variance analysis of *N. crassifolia* showed that the effect of planting density was significant on the shoot yield and the essential oil yield at the probability level of 1%. The yield of shoot and the yield of essential oil in stratification treatment were the highest with 1460 and 10.2 kg per hectare, respectively. Considering the two levels of planting density in this research, the density treatment of 66,000 seeds per hectare was considered suitable.

Keywords: lamiaceae, Nepeta, yield, essential oil

Quantitative and Qualitative Response of *Nepeta pogonosperma* to Different Nutritional Treatments

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Abstract

Considering the importance of rare and endangered medicinal plants, including some species of Nepeta, it is important to investigate various factors to preserve and domesticate them. In this project, first, the seeds of an exclusive species of Nepeta genus in the country named *Nepeta pogonosperma* were collected. After checking its Seed viability, the seeds were first planted in the greenhouse. After the preparation of the farm, transplanting was done. The treatments included fully rotted manure at three levels of 0, 20, and 40 tons per hectare, vermicompost at three levels of 0, 6, and 12 tons per hectare, *Azospirillum lipoferrum*, *Glomus intraradices*, and *Pseudomonas putida*. The statistical design was randomized complete blocks with 3 replications. The time of applying all the treatments was during the preparation of the farm and transplanting. Necessary care during the plant growth period such as irrigation and weed control was done for all the plots in the same way. In the flowering stage (flowering above 70%), the morphological traits were recorded and then the plants were picked from about 10 cm above the soil. The harvested plants were dried in the shade and with air flow, and after calculating the percentage of moisture in the samples, the essential oil was extracted by distillation with water and through a Clevenger within 2 hours. The results showed that among the three treatment groups of manure, biological and vermicompost, the highest percentage of essential oil was found in *Azosprillum* and the lowest amount of essential oil was found in *G. intraradices* among biofertilizers. The lowest amount of dry weight was observed in the treatment of vermicompost and the highest amount of dry matter was observed in the treatment of manure. Among the combined fertilizers, the highest percentage of essential oil was observed in the combination of *Azosprillum lipoferrum* and manure. The highest height was seen in *G. intraradices* and the lowest in *Psudumunas putida*. Among the combined fertilizers, the combination of manure and *Azosprillum lipoferrum* had the lowest height. The use of combined manure and *Azosprillum lipoferrum* has increased vegetative growth and plant yield. It was observed that nepeta lactone and 1, 8-cineole were affected by different treatments.

Key words: Medicinal plants, Nepeta, *Nepeta pogonosperma*, Nepeta lactone

The effects of glutamic acid and aspartic acid in reducing Pb stress in medicinal plants

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Abstract

Soil pollution with heavy metals can be very harmful for plants. In the meantime, lead can be a serious threat to the environment due to its low mobility and high sedimentability. One of the methods of remediation of soils contaminated with heavy metals is the use of chelating materials. The aim of this study is to evaluate the potential of two natural chelates of glutamic acid and aspartic acid in reducing lead stress in medicinal plants. Today, the use of these two chelates as growth regulators is increasing. These two amino acids act in the transfer and storage of nitrogen and directly and indirectly affect the growth and development of plants. In general, chelating materials can change the solubility and absorption capacity of heavy metals by having multiple bonding sites in their structure. In this study, the mechanism of the effects of foliar spraying of glutamic acid and aspartic acid in reducing lead stress in some medicinal plants has been investigated. In general, it can be said that the use of chelating agents, especially glutamic acid and aspartic acid, can have a positive and significant effect on reducing lead absorption by medicinal plants.

Key words: Aspartic acid, Glutamic acid, Lead stress, Morphological features.

Effects of nitroxin, supernitroplus, vermicompost and urea on the quantitative and qualitative yield of mint (*Mentha aquatica*)

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Abstract

Consumption of chemical inputs in agricultural lands has caused environmental pollution, the most important of which is water and soil pollution, as a result of which human health is also endangered. For this purpose, a study was conducted to investigate the effect of nitroxin, supernitroplus, vermicompost and urea fertilizers on the quantitative and qualitative yield of *Mintha aquatica*. This research was performed in 9 fertilizer treatments and 3 replications in a randomized complete block design. The treatments of this study are control treatments (no fertilizer application) and three different types of biofertilizers including vermicompost (3 and 6 tons per hectare), nitroxin fertilizer (4 and 8 liters per hectare), supernitroplus fertilizer (amount 4). And 8 liters per hectare) and urea chemical fertilizers were 23 and 46 kg/ha, respectively. The results showed that the highest amount of leaves was related to nitrogen treatment 46 kg / ha (16334) and supernitroplus fertilizer treatment (8 liters per hectare) (14201) ($p < 0.01$). Also, based on the results, the highest percentage of essential oil was related to nitrogen treatment of 46 kg / ha (2.07) and supernitroplus fertilizer treatment (8 liters per hectare) (1.91) ($p < 0.01$). In general, the results showed that the highest values of all measured traits were related to nitrogen treatments of 46 kg / ha and supernitroplus fertilizer (8 liters / ha). In general, as a conclusion of this study, it can be stated that the use of biofertilizers increases the quantitative and qualitative yield of water mint and these fertilizers can replace or reduce the use of chemical fertilizers in agricultural ecosystems, which is a step towards Minimize environmental pollution and sustainable agriculture.

Keywords: Medicinal plants, percentage of essential oil, mint, Mentha aquatica, sustainable agriculture

Effect of Spent Mushroom Compost (SMC) on Quantitative and Qualitative characters of German Chamomile (Matricaria recutita.L.)

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Abstract

Spent mushroom compost (SMC) is a by-product of *Agaricus bisporus* production industry that is consist of a lot of organic and mineral, appropriate microbial biomass and high levels of enzymes and oxidants. To investigating on effects of SMC on the quantitative and qualitative characteristics of the German chamomile (Matricaria recutita L.), SMC in rates of 5, 10 and 15% as a partial substrate was used and experiments conducted in a green house, in a completely randomized design with six replicates for each treatment. At the end of flowering period, growth, yield, essential oil, polyphenols and flavonoids were measured. The results showed that adding different amounts of SMC to the cultivation medium of the German chamomile plant significantly increased the growth of the plant and improved its flowering. At the higher rates of SMC, essential oils percentages and polyphenols and flavonoids amounts increased significantly compared to control.

Totally, it can be concluded that application of SMC as an organic fertilizer leads to improve growth, yield, essential oil and antioxidant traits in German chamomile.

Effect of Nitrogen and Potasium Fertilizers on the yield and essential oil of *Rosmarinus officinalis*

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Abstract

To evaluate the effect of nitrogen and potassium fertilizer on yield and essential oil of Rosmary Branch dry matter an Experiment was carried out on a farm located in Mazandaran province (Tonekabon, Shirud, village of Saleh Abad) in 1392-93 in a Factorial experiment in a randomized complete block design with 3 replications. treatments were Combination of urea fertilizer 46% at three levels (0, 50, 100 Kg N/ha) and potassium sulfate (12%) at three levels (0, 40 and 80 Kg k_2o/ha). comparison of the interactions of nitrogen and potassium fertilizer used in the investigation of the dry Matter of *Rosmarinus* by Tukey test at 5% level showed, treatment a1b3 (zero kg N and 80 kg of k_2o/ha) and a3b3 (100 kg N and 80 kg k_2o/ha) and a2b2 (50 kg N and 40 kg of k_2o/ha), respectively, with the 6239.4, 5868.7 and 5450.4 kg/ha of dried matter of *Rosmarinus* had the highest production among the treatments. So, the three-treatment s a1b3, a3b3 and a2b2 were the best treatments of *Rosmarinus* to produce maximum dry matter yeild. The experiment revealed that the most percent of essential oil (1.5) for treatment 50 kg N/ha and 80kg of k_2o/ha. At total 84 chemical combination were identified and the most important combination were alpha-pinene, cineol, Verbenone, borneol, camphene, beta-pinene and bornyl acetate. In this study, the maximum amount of camphene and Beta-pinene compounds in the treatments was devoted to the treatment of a1b3. Essence of *Rosmarinus* flowering shoot in these treatments were 11% and 7/91% of camphene and Beta-pinene respectivly, so if the purpose of the production of chemical compounds *Rosmarinus* alfa-pinene, cineol, camphene and betapinene (the Perfume industry and pharmaceutical applications) is to consider the maximum performance of the dried flowering tops a1b3 is the most appropriate treatment.

Keywords: Rosemary, combine essential oil, potassium fertilizer, N fertilizer, yield.

The need to pay attention to the ecosystem of medicinal plants in personalized medicine

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Abstract

In order to therapy the disease, in addition to knowing the factors that cause the disease, the healer must also have two other knowledges so that effective therapy and finally complete therapy can be achieved. The first recognition refers to the accurate understanding of the patient's temperament (Mizaj), and the next recognition refers to the drug's temperament. Since temperament as a qualitative term is the result of the reaction or mutual effects of numerous elements in the body or compounds, it can have endless variety; as an example, human temperament is influenced by various factors such as race, sex, age, morals, habits and climate. The multiplicity of elements and the variety of factors have caused a kind of return to tradition in today's medicine, and human individuality is considered as the sole factor for prescribing medicine. Currently, the term personalized medicine is a much-known topic and a forward movement in modern medicine, which is rooted in traditional medicine. What is perhaps the difference between these two seemingly separate categories (traditional medicine and modern medicine), but in essence they are interwoven in the subject of personalized medicine, is that in the course of traditional medicine, the subject is looked at from the point of view of temperament, and in medicine Modern, it is the individual's genetics that is the criterion of action. In addition, it seems that in order to fully customize the therapy, in addition to examining the individuality of the person, attention should also be paid to the drug; Because secondary metabolites as the effective components of medicinal plants have a temperament based on their function in the body of organisms, therefore, in person-centered medicine, in the case of prescribing medicinal plants, attention should also be paid to the fact that the effective substance in question can have different or even opposite therapeutic behaviors in different patients. Be In this sense, it is necessary in personalized medicine, in addition to paying attention to the patient himself, the behavior of the drug should also be taken into account. In this article, it is an attempt to discuss the importance of climate and ecosystem in the creation of effective substances in medicinal plants and their mutual effects in human consumers in the path of realizing personalized medicine.

Key words: climate, temperament, secondary metabolites, therapy and genetics.

A review of new findings about antiviral medicinal plants in veterinary medicine

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Abstract

In recent years, effective medicinal plants against animal viruses that have a high mortality rate and cause a lot of economic losses, have received much attention from researchers. This research reviewed 43 plant species with antiviral activity against the *Paramyxoviridae*, *Orthomyxoviridae*, *Herpesviridae*, *Poxviridae*, *Parvoviridae*, *Nimaviridae*, *Coronaviridae*, *Rhabdoviridae* and *Reoviridae* families that cause fatal diseases in poultry, ruminants, equines and aquatic animals. It is worth noting that recent findings have shown the antiviral activities of plant species including *Geranium sanguineum*, *Echinacea angustifolia*, *Eucalyptus globulus*, *Zingiber officinale* and *Ginkgo biloba* in laboratory conditions. However, due to the high mutation rate of viruses, new strains resistant to antiviral drugs are constantly emerging. Therefore, there is a need to continuously explore to discover and produce new antiviral compounds.

Keywords: Medicinal plants, Antiviral, Veterinary medicine

The effect of silver nanoparticles synthesized by leaf and flower extract of convolvulusarvensis on Staphylococcus aureus and Escherichia coli

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Abstract

Synthesizing silver nanoparticles is a new therapeutic approach to combat resistant pathogens to antibiotics. Silver nanoparticles are synthesized by extracts of different herbs and their effect on different bacteria has been studied. In the current research, the antibacterial effect of silver nanoparticles synthesized by leaves and flowers extract of convolvulus arvensis on two harmful bacteria, i.e., Staphylococcus aureus and Escherichia coli was studied. Ultraviolet Spectrophotometry and Scanning Electron Microscopy were used to control quality of the synthesis and confirm the result. The synthesis of the nanoparticles was confirmed by SEM. The antibacterial activity of the synthesized silver nanoparticles on S. aureus and E. coli was tested by the well diffusion method. The diameter of inhibition zone was in dilutions of $\frac{1}{5}$، $\frac{1}{7}$، $\frac{1}{10}$، $\frac{1}{20}$، $\frac{1}{100}$, and $\frac{1}{1000}$ µg/ml. Results showed that the greater the concentrations, the greater the diameter of inhibition zone will be. Finally, it was shown that synthesizing silver nanoparticles by plant extracts have antibacterial effect.

Keywords: Escherichia coli, Staphylococcus aureus, green synthesis, silver nanoparticles, Convolvulus arvensis

The effects of glutamic acid and aspartic acid in reducing Pb stress in medicinal plants

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Abstract

Soil pollution with heavy metals can be very harmful for plants. In the meantime, lead can be a serious threat to the environment due to its low mobility and high sedimentability. One of the methods of remediation of soils contaminated with heavy metals is the use of chelating materials. The aim of this study is to evaluate the potential of two natural chelates of glutamic acid and aspartic acid in reducing lead stress in medicinal plants. Today, the use of these two chelates as growth regulators is increasing. These two amino acids act in the transfer and storage of nitrogen and directly and indirectly affect the growth and development of plants. In general, chelating materials can change the solubility and absorption capacity of heavy metals by having multiple bonding sites in their structure. In this study, the mechanism of the effects of foliar spraying of glutamic acid and aspartic acid in reducing lead stress in some medicinal plants has been investigated.

Key words: Aspartic acid, Glutamic acid, Lead stress, Morphological features.

Green synthesis of silver nanoparticles using *Perilla frutescens* extract and evaluation of their biological activity

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Abstract

Bionanotechnology techniques as eco-friendly and cost-effective routes are used to fabricate nanoparticles and nanomaterials. In the technique of green synthesis of nanoparticles, bioactive metabolites present in plant extracts can be used to reduce metal ions to nanoparticles in a single-step process. In the present study, green synthesis of silver nanoparticles was evaluated by bio-reduction of silver nitrate (with concentrations of 0.5, 1, and 3 mM) using medicinal plant extract of *Perilla frutescens* (with concentrations of 1, 2.5, 5, and 10 %). It was confirmed production of silver nanoparticles (Pf-AgNPs) by changing the color from pale yellow to dark red and also through the strong peak of absorption at wavelengths of 440 nm using UV–visible spectrophotometry. The morphology of the nanoparticles was determined by electron microscopy analysis (TEM). Also, the biological activity of Pf-AgNPs was evaluated. Results revealed that Pf-AgNPs contain highe TPC (Total Phenolic Content), TFC (Total Flavonoid Content), and high level of antioxidant activity. In near future, the synthesized AgNPs could be used in the fields of water treatment, biomedicine, biosensor and nanotechnology.

Keywords: Green synthesis**,** Nanoparticle, Silver, *Perilla frutescens*

Feasibility of supplement jobs creating with the emphasis on rural entrepreneurship centers: case study: Desert truffles

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Abstract

One of the government's plans for the development of sustainable employment and green jobs is to rely on neighborhood and regionalism in order to connect the jobs that are available in the provinces with the cooperation of local entrepreneurs with help of the government. In this regard, entrepreneurial centers should be revived, formed and developed. Global experience has shown that we should take two paths for employment, one path is investment and large companies and projects, and the second path is specific to countries that have gone through recession and have little capital, relying on local development. In the local development of job creation, capacities should be considered. However, some provinces of the country (Iran), including Zanjan province, especially Tarom city, have a high capacity in the field of knowledge-based production and green jobs, including in the field of mountain mushrooms (called Donbalan in Persian. According to the current value of this mushroom, which is the most expensive, delicious and rare mushroom in the world, it varies from 100 to 500 dollars per kilo gram in the world markets (2020-2022). It is expected that using from the results of this local capacity, the local centers close to the growth areas of this mushroom in the country, can take a big step in increasing income, improving livelihoods, and benefiting from the natural reserves of their villages as a strategic export product and currency earner. In addition to job creation, indiscriminate migrations are prevented and delinquency is prevented in the targeted areas, and it is hoped that soil erosion and destruction of pastures will be prevented in the environmental field, and while the vegetation cover of susceptible areas will be increased. It will finally be possible to achieve a partial development programs and sustainable employment in the form of green and knowledge-based jobs.

Keywords: Cooperatives, Labour, and Social Welfare of Iran, Truffles, Supplement Jobs.

The effect of potassium nitrate on the amount of chlorophyll a, b and proline of Salicornia persica AKHANI under salt stress

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Abstract

In the most regions of the world, salinity stress is the most important stress that limits the growth of plants and its performance by decreasing the Osmotic potential and disrupting the absorption of water and some nutrients. Salicornia plant is belongs to the chenopodiaceae of family, which it is cotains 5gnus and 6 species in Iran. The leaves are reduced and hairless in this plant and it may have changed to a certain extent. Potassium nitrate is a chemical substance that it is used a lot to increase the germination of seeds. An experiment was carried out in2019 in the research greenhouse of Malayer University in a factorial manner in the form of a completely randomized design, to evaluate the effect of different concentrations of potassium nitrate on the morphophysiological characteristics of *Slicornia Persica* under salinity stress. On the other hand, salinity caused a reduction in the amount of photosynthetic pigments. The amount of Proline increased at 300ppm salinity and decreased at 600ppm salinity. Generally, It can be conclded that spraying of *Salicornia Persica* with potassium nitrate improved the growth and tolerance of this plant against salinity stress and improved the effects of salinity.

Key words: salinity stress, the number of leaves, photosynthetic pigments, Proline.

Medicinal Properties of *Bacopa Monnieri L.*: A review

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Abstract

Bacopa monnieri L. (family Scrophulariaceae), generally known as "brahmi", is a reputed drug of Ayurveda. It is widely cultivated in the warmer regions near the irrigated fields. In traditional Indian medicine, *B. monnieri* has been used to elevate the performance of memory and intellect, as a medical treatment for neurological disorders. It contains Bacosides A and B, to which the medicinal properties have been attributed. Studies on the extract isolated from *B. monnieri* have revealed that it possessed many pharmacological effects such as memory-enhancing effect, anti-inflammatory, antimicrobial, antioxidant, gastrointestinal, and tranquilizing effect. The aim of this paper is to review the uses and pharmacological activities of *Bacopa monniera*.

Keywords: *Bacopa Monnieri L.*; Brahmi; Medicinal plant; Pharmacology

Medicinal Properties of *Curcuma longa L.*: A review

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Abstract

Curcuma longa L., a member of the ginger family (Zingiberaceae), is widely utilized in traditional medicine and herbs to treat different disorders. It is a rhizome plant which is commonly known as Turmeric. The rhizomes, the part of the plant used medicinally are horizontal underground stems and contain curcumin, which is the main chemical substance in *Curcuma longa L*. PubMed, ScienceDirect and which are available online were searched to analyze its properties. Curcumin, also known as diferuloylmethane, has been proven for its anti-inflammatory, anti-oxidant, neuroprotective, antibacterial, anti-diabetic and anti-cancer activities. In this paper we make an overview of the medicinal and pharmacological activities of *Curcuma longa L.* in the treatment of various diseases.

Keywords: *Curcuma longa L.*; Turmeric; Curcumin; Medicinal plant

The effect of onion size on the quantitative and qualitative yield of saffron (*Corocus sativus*) in the resort area of Jannet Rudbar

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Abstract:

In order to investigate the effect of onion size on the quantitative and qualitative yield of saffron, an experiment was conducted in 2019-2020 in the resort area of Jannet Rudbar, Ramsar city, in the form of randomized block design, were performed in three replications, two treatments and three plots. From quantitative traits: flower weight, the number of flowers, the weight of wet stigma, the weight of dry stigma and qualitative traits: three important compounds of saffron; Crocin, pyrocrocin and safranal were measured. Research between the experimental treatments (large onion and medium onion) in terms of traits, the wet flower yield, the dry stigma yield and the wet stigma yield, a significant difference was observed at the 5% level, and the large onion treatment with significant difference was better than the medium onion treatment, but in terms of the number of flowers, no significant difference was observed between the two research treatments. The production product of both research treatments was evaluated at the premium level in terms of quality.

Keywords: Onion, quantitative, qualitative, saffron, yield.

Morphological, Chemical and Antioxidant properties of *Dracocephalum moldavica* L.: A review

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Abstract

Dracocephalum moldavica L. which is known in Persian as baderashbo belongs to the Lamiaceae family. *D. moldavica* is cultivated in eastern and central Europe. In Iran, *D. moldavica* is mainly cultivated in Mazandaran, Yazd, Tehran, and Azerbaijan provinces. It has a long history of use as a spice and medicinal plant. *D. moldavica* is a good source of protein, lipids and fibers which possess antioxidant and antimicrobial activities. *D. moldavica* essential oil has a citrus-like flavor containing high content of oxygenated acyclic monoterpenes, ketone, aldehyde and alcoholic function groups. The major constituents of the essential oil of *D. moldavica* were found to be geranyl acetate, geranial, neryl acetate, geraniol, neral and nerol. Thus, *D. moldavica* could be used as a promising ingredient in food products. In this regard, in the current mini review, the morphological characteristics, chemical composition and biological activities of *D. moldavica* will be introduced and its usage in food industry will be considered.

Keywords: *Dracocephalum moldavica* L., Chemical Composition, Essential Oil, Food industry, Biological activity.

Investigating the antioxidant, antimicrobial and antiproliferative activities of Eryngium planum extract against cancer cell line Hela and Enterococcus faecalis

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Abstract

Plants have been established to be a rich resource of antioxidant and antibacterial compounds and include large amounts of secondary metabolites useful properties of these extracts are related to secondary metabolites such as phenolic, flavonolic, and flavonoid compounds. *Eryngium planum* is a genus of aromatic plants native to the northern regions of Iran. Some of its medicinal benefits are already known. The purpose of this study is to investigate the effect of *Eryngium planum* plant extract on *Enterococcus faecalis* bacteria (causing endocarditis, sepsis, meningitis and urinary and genital tract infections) along with evaluating Hela cell viability in the presence of the extract. After collecting the plant and drying it, methanolic and aqueous extracts in two methods (soaking and soxhelet) were prepared. Since phenolic compounds have multiple effects, the amount of phenolic compounds in the methanolic extract was measured by the Folin-ciocalteu method. Antimicrobial activity was first measured by disk diffusion test, and then MIC and MBC were measured by Microdilution method. Finally, the anti-proliferative activity of plant extracts on cervical cancer cell line (HeLa) was investigated using MTT method.

The volume of phenolic compounds of methanolic extract was 901/66mg/ml. In the study conducted, *Eryngium planum* has a significant amount of phenolic compounds, hence it is a suitable candidate for measuring its antimicrobial and anti-proliferative activity.The investigation of the antimicrobial effect showed that In the case of the methanolic extract isolated by the Soxhlet method, the concentration of 50 mg/ml as MIC and the concentration of 100 mg/ml as MBC, and in the case of the methanol extract of the plant prepared by the soaking method, the concentration of 100 mg/ml as MIC and the concentration of 200 mg/ml as MBC were considered and the results of MTT assay showed that the extract of this plant has no inhibitory effect on HELa cancer cell line.According to the obtained results, the extract of this plant can be a suitable candidate for replacing antibacterial chemical drugs.

Green synthesis of copper nanoparticles via *Glycyrrhiza glabra*- a medicinal plant

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Abstract

Today, nanotechnology is growing due to its wide and abundant application in science and industry. Although there are chemical and physical methods for nanoparticle synthesis, it is necessary to use synthesis methods without the use of toxic chemicals and byproducts. In this regard, the use of plant extracts is hopeful because plant extracts contain many compounds that could reduce metal ions to nanoparticles (NPs). *Glycyrrhiza glabra* is one of the important medicinal plants, which is a rich source of secondary metabolites that can synthesize, stabilize and coat NPs. In this study, the aqueous extract of *Glycyrrhiza glabra* (Licorice) was used to synthesize copper nanoparticles (CuNPs). Morphology and physicochemical properties of particles were investigated. Our results showed that green synthesized CuNPs were a spherical shape with a size of 335 nm. The zeta potential of the particles was +7. Therefore, these particles can be suitable candidates for interacting with negatively charged compounds. This study has proved a green, safe, and biodegradable CuNPs synthesis method, which can be used in many fields such as biology, medicine, and agriculture for many usages, gene delivery, and biomolecules purification.

Keywords: Licorice extract, synthesize, Copper nanoparticles, morphology, zeta potential

Autecology study of *Ferula gummosa* medicinal species in North Khorasan province

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Abstract

In order to make maximum use of grasslands, the principles of grassland management should be implemented based on ecological studies. By taking into account the ecological conditions and comprehensive cognitive studies, which is one of the basic ways to preserve and optimally exploit natural resources, we can take steps in this direction. Barijeh plant is one of the most important pasture plants with the scientific name of *Ferula gummosa* from Apiaceae family, which has been used in traditional medicine since ancient times. Since Barijeh is a native species of Iran and due to the importance of this medicinal plant in traditional medicine and also because unfortunately there is no report on the ecological characteristics of this rare medicinal species in North Khorasan, the present study investigates its ecological properties. Such as altitude, EC, pH. for this purpose, clumps of Barijeh plant and soil samples were collected from natural habitats in North Khorasan province. Investigations showed that Barijeh habitats have clay loam and sandy loam texture, medium to shallow depth, and structure without fine and medium angles with medium strength. This plant grows at an altitude of about 2000 meters above sea level on the southern slope with a slope of about 40 degrees. Examining the pH of the soil in the area showed that its pH is in the range of 6.7 and the pH value of the soil has a negative correlation with the EC value.

Key Words: EC, ecology, grassland, pH

Molecular study of *Ferula gummosa* medicinal species in North Khorasan province

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Abstract

Barijeh plant is one of the most important pasture plants with the scientific name of *Ferula gummosa* from Apiaceae family, which has been used in traditional medicine since ancient times. Since Barijeh is a native species of Iran and considering the importance of this medicinal plant in traditional medicine and also because unfortunately there is no report on the molecular characteristics of this rare medicinal species in North Khorasan, the purpose of this research is to investigate the plant from The molecular point of view is through genomic DNA extraction, sequence determination and bioinformatic studies to identify the molecular status of the plant. For this purpose, clumps of Barijeh plant were collected from natural habitats in North Khorasan province. The collected samples as well as the herbarium samples of the species in the region were carefully studied and identified and their leaves were used to extract DNA from the kit. The quality and quantity of DNA was determined using the Nanodrop device. Amplification of DNA sequences was done using the nrDNA ITS nuclear marker with the help of PCR for one to three samples of each species. To check the result of PCR, electrophoresed PCR samples and single-band PCR products, unsmeared and clear, after evaluation by agarose gel electrophoresis, were sent to Codon Genetics Company for sequencing. In order to analyze the data obtained from the molecular studies, the sequences were aligned by Clustal X software and the MUSCLE program, and the reconstruction of the phylogeny tree was performed based on the data obtained from the DNA sequences using the maximum parsimony methods embedded in the PAUP* software. The analysis of determining the sequences led to the registration of the relevant sequences in the gene bank.

Key Words: DNA, Nuclear, PCR, Sequencing

Investigating some soil characteristics of agricultural lands in Borujerd city for saffron cultivation using GIS

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Abstract

Considering the expansion of saffron cultivation in most regions of Iran, it is essential to know the soil characteristics of agricultural lands in each region .Therefore, how some important characteristics of the soil in the arable lands of Borujerd city were investigated by of geographic information system (GIS) and network analysis process (ANP) for saffron cultivation .Raster layers of organic matter, total nitrogen, potassium and available phosphorus of the soil were prepared with the help of sampled information with the help of IDW interpolation method in ArcGIS10.7 in the agricultural lands of the study area .Then the final land suitability map was produced by weighted parameters using ANP. Finally, this map was divided into four categories: highly suitable, moderately suitable, marginally suitable and unsuitable. The final land suitability result showed that the share of highly suitable, moderately suitable, marginally suitable and unsuitable classes was 2.03, 38.84, 58.17 and 0.95% of the total studied lands, respectively .Examining the map of soil factors showed that restrictions (marginally suitable and unsuitable) were created in 59.18, 97.3, 7.96 and 79.65 percent of the total lands of Borujerd city.

Keywords: potassium, phosphorus, total nitrogen and organic matter.

The effect of Matricaria recutita powder on reproductive organ damage in diabetic male rats

Afsaneh Mozaffarinia, Ali Gol

Abstract

Introduction: Diabetes Mellitus is an important metabolic disorder with numerous complications that affects all body systems and has destructive effects on the function of reproductive and sexual organs. Considering the ant-diabetic effects of medicinal plants, the effect of chamomile (Matricaria recutita L.) powder consumption on reproductive organ damage caused by streptozotocin-induced diabetes was investigated.

Methods: Twenty-four male rats were randomly divided into four groups. 1-Normal group (N), 2-Normal group + chamomile powder (N+Ch), 3-Diabetic group (D), diabetes was induced by intraperitoneal injection of 60 mg/kg streptozotocin.and 4-Diabetic group + chamomile powder (D+Ch). Groups N+Ch and D+Ch received chamomile powder, 350 mg/kg for two weeks, and then the changes in the weight of the reproductive organs were investigated. **Result**: The weight of the testis, seminal vesicle, and prostate in the D group showed a significant decrease compared to group N showed. Also, the results showed a decrease in the weight of vasodferon and epididymis in group D compared to group N, but these changes was not significant. Consumption of chamomile powder in the D+Ch group caused the changes to return to the N group and prevented the weight loss of the reproductive organs.

Conclusion: Chamomile powder has a therapeutic effect on weight loss of reproductive organs caused by diabetes.

Keyword: Diabetes Mellitus, Reproductive organs, Chamomile, Male rat

Determining the best method to overcome the dormancy of baneh (*Pistacia atlantica* Desf) seeds

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Abstract:

Turpentine tree or wild pistachio (*Pistacia atlantica* Desf.) belongs to the Anacardiaceae family. This tree likes drought and grows well in hot and dry areas. The fruit of this tree is an oily seed, hard, small and round, and its ripe green color. Beneh seed oil is used for medicinal and edible purposes. The resinous compounds extracted from the trunk of the baneh tree called turpentine have significant industrial value. Beneh oil has a lot of saturated and unsaturated fatty acids and terpenoids and sesquiterpenes, which has made it one of the best edible oils. Propagation of baneh is done through seed cultivation, but the existence of mechanical and physiological stagnation is one of the inhibiting factors of seed germination in this plant, which causes a decrease in the percentage and speed of seed germination. This experiment is to overcome the mechanical and physiological stagnation of the baneh seed in a factorial way in the form of a completely random basic design in four replications with four factors including: scratching on two levels (without scratching and treatment with 70% sulfuric acid), cooling in three levels (without cold treatment, wet cooling at 4 degrees Celsius and dry cooling at -20 degrees Celsius), potassium nitrate at three levels (zero, one and two percent) and gibberellic acid at two levels (zero and 50 mg per liter) was done. The results showed that the simultaneous application of three treatments of seed scraping with 70% sulfuric acid, wet chilling and gibberellic acid have the greatest effect on breaking seed stagnation, followed by an increase in the percentage and rate of germination of cotyledon seeds, as well as the initial growth of seedlings.

Key words: Turpentine, dryness, scarification, dormancy, germination

Investigating the cultivation and domestication of wild populations of Iranian shallots(*Allium hirtifolium* Boiss.) from the habitats of Zanjan province

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Abstract:

Iranian shallot (*Allium hirtifolium* Boiss.) is one of the native species of Iran's pastures, which is exploited more than the ecological capacity due to the difficulty of seed germination and the need for three-year establishment of the seed until it reaches the useful age. The removal of the populations of this plant has put it at risk of extinction. The purpose of this study is to identify habitat characteristics and collect and domesticate different stands of this valuable plant in Zanjan province. Three repetitions were done and the harvest was done at the end of May, the results showed that the best yield was obtained from the density of 20 tubers per square meter with a weight of 5 grams. Due to the possibility of faster exploitation of small tubers in the first year, it is suggested to treat the seeds with growth control substances in a small area for the production of shallots, and in the following years, the small tubers obtained should be cultivated in a larger area. be made

Keywords: shallot, domestication, pasture, seed.

Investigation and evaluation of effective factors from planting to harvesting of ginger

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Abstract

Ginger is one of the oldest medicinal plants and spices in the Orient. Ginger in Tamil is derived from the root ingirer which means rhizome. The Chinese and Indians have used ginger rhizomes in most of their handicrafts such as bread, cookies, cakes, as well as in the preparation of various beverages for a long time. Ginger is a herbaceous, perennial plant that is usually grown as an annual plant. Due to the fact that ginger rarely produces seeds, hence this plant is vegetative and carried out by rhizomes. The type of rhizomes plays a major role in the growth and yield of the product. This plant belongs to the ginger family and its origin is reported in Southeast Asia. However, due to the ease of transportation and cultivation of the rhizomes, this plant has been transferred and cultivated in tropical and subtropical regions of both hemispheres. This research examines and evaluates the effective factors in the production of this medicinal plant until its harvest and explains the solutions necessary for the development and optimization of this product from planting to harvest, which is both economical and affordable in terms of volume. the dynamics of this valuable drug plays an important role.

Keywords: ginger, seed rhizome, production development, optimization.

The influence of extraction methods on the essential oil content and the chemical composition of *Prangos ferulacea* (L.) Lindl

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Abstract

Prangos ferulacea is a medicinal plant that grows in central Asia and is appreciated because of its value in medicine, perfumery, and forage industries. In order to gain the optimum oil yield of *P. ferulacea*, the essential oils of individuals were isolated from the aerial parts by steam distillation and hydrodistillation methods 44 days after the leaf emergence. The oils were analyzed by capillary GC (Gas Chromatography). The extraction yields from the aerial parts of *P. ferulacea* were found to be 0.16% and 0.29% for steam distillation and hydrodistillation, respectively. Thirty-tow components, comprising 99.98% of the total oil, were identified at species individuals, in which (E)-caryophyllene (47.45%) for steam distillation method and, α-humulene (9.89%), spathulenol (7.26%), linalool (5.15%), and δ-3-carene (3.73%) for hydrodistillation method were recognized as the major components. Based on our findings, essential oil yields vary considerably and are influenced by extraction methods. So that, by hydrodistillation method both quantity and quality of oils can strongly enhance in the species.

Keywords: *Prangos ferulacea*, steam distillation, hydrodistillation, (E)-Caryophyllene, α-Humulene, δ-3- Carene

Investigating the medicinal and phytochemical properties of three endemic species "*Nectaroscordum Tripedale* (Trautv.) grossh , *Ornithogalum narbonenese* L. and *Pimpinella anthriscoides*" in Kermanshah province

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Abstract

Nectaroscordum tripedale (Trautv.) Grossh, from the Alliaceae family, it is one of these species that grows in Iran in the western regions of the country, and local people use its leaves as an edible vegetable. Chemical compounds of this species have various biological effects such as antimicrobial, anti-protein, antioxidant, anti-tumor, blood pressure reduction, fat reduction, hepatosteroid and antithrombotic activities. In addition, this plant contains significant amounts of iron, copper, zinc, and manganese minerals. Antimicrobial, disinfectant and antioxidant properties of *Ornithogalum narbonenese* have caused their medicinal compounds to be identified by researchers. So far, there has been no research on the phytochemical properties of the species in Iran, and no study has been conducted on the essential oil of the species and its analysis in the world. *Pimpinella anthriscoides* species from the Apiaceae family, which is distributed in the northern regions of Kermanshah province. Anti-flatulent, expectorant, anti-depressant, analgesic, disinfectant, anti-viral, anti-fungal, anti-spasm effects have been reported from the plants of this genus. The importance of consuming these species can be demonstrated by studying the medical properties and chemical composition of these plants. Thus, the impact of these plants on human health can be identified in this manner.

Keywords: *Nectaroscordum tripedale, Ornithogalum narbonenese, Pimpinella anthriscoides,* medicinal properties, chemical composition.

Effect of drought stress on the activity of some antioxidant enzymes and total soluble proteins of thyme (*Thymus vulgaris* L.)

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Abstract

Thyme is one of the most important medicinal plants which grows naturally in wide areas of range lands in Iran and simultaneously is cultured widely in Iran and other parts of the world. As Iran has placed in arid and semi-arid regions of the world, with actually low precipitation, doing projects in order to reveal the mechanisms or increase the drought tolerance of crop and medicinal plants has great value. Drought stress decreases the yield and quality of medicinal plants as well as crops. To investigate the mechanisms of drought tolerance of thyme plants and to evaluate the possibility of increasing

g of drought tolerance in these valuable medicinal plants, activity of some antioxidant enzymes and total soluble proteins were been analyzed in *Thymus vulgaris* L.in a complete randomized design experiment. After reaching to the adequate stage of growth, seedlings were grown in pots containing suitable soil, were subjected to different levels of drought stress (80% as control, 60% and 40% irrigation of field capacity (FC) as treatments). Results show that, drought stress had significant effect on total protein content as well as the activity of antioxidant enzymes. At 60% FC treatment and especially at 40% FC the amount of total soluble proteins drastically decreased. However; the activity of catalase increased at 60% FC treatment. The activity of peroxidase did not change significantly at 60% treatment but its activity decreased at 40% treatment. As a conclusion; it can be suggested that, one of the drought tolerance mechanisms of thyme is increasing of the activity of antioxidant enzymes especially the activity of catalase.

Keywords: Antioxidant enzymes, Drought stress, Medicinal plants, Thymus vulgaris, Total protein.

Effects of stinging nettle (*Urtica dioica L.*) powder on body weight and mortality rate in broilers exposed to chronic heat stress

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Abstract

Heat stress is one of the most prevalent environmental stressors that leads to weight loss, mortality, and economic losses in the poultry industry. Stinging nettle is a medicinal herb with strong antioxidant properties. The present study was conducted to evaluate the effects of dietary stinging nettle at two different levels (2% and 4%) on growth performance and oxidative stress indices of broilers exposed to chronic heat stress. On day 14, a total of 160 broiler chickens were randomly assigned to four treatment groups as follows: 1) NC: negative control; 2) HS: heat-stressed broiler; 3) HS-SN2: heat-stressed broiler fed by 2% dietary stinging nettle; 4) HS-SN4: heat-stressed broilers fed by 4% stinging nettle. Diet supplementation with stinging nettle was performed from days 14 to 29 and a chronic heat stress was induced from days 22 to 29. As a result, body weight gain decreased in the HS compared to the Ctrl, and it increased in the HS-SN2 and HS-SN4 compared to the HS. HS had 5% mortality rate in heat stress period. In conclusion, the addition of stinging nettle powder to the broilers' diet improved the body performance in heat-stressed birds. Furthermore, this herb could be utilized as a feed additive in poultry diet to improve bird's health and defense mechanisms under stressful conditions.

Keywords: Heat stress, Stinging nettle, Body weight, mortality rate, Broilers.

The complication of sweeping in *Elaeagnus angustifolia* (EA) orchards and the necessity of selecting disease-resistant genotypes (case study: oleaster gardens in University of Zanjan-Iran)

Ali Ammarellou

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Abstract

Although our perception related to medicinal plants are mostly one-year and sometimes multi-year medicinal plants, but medicinal shrubs and medicinal trees have also played an important role in human history and memory therapy. The *Elaeagnus angustifolia*, commonly called Russian olive or oleaster, is native to Europe and Asia. It is a small, usually thorny, deciduous tree or large shrub that is typically grown for its silvery foliage, small fragrant yellow flowers, olive-like fruit and ease of cultivation. The Russian olive (Oleaster) tree/shrubs is one of the important medicinal plants, especially in semi-arid and dry regions of the world. This fruit and plant is known as Senjed in Iran. Olester (Senjed-persian) is one of the seven ingredients of the Haftsin Iranian table. In addition to the medicinal properties of soothing and calming muscle pain, as well as its effectiveness in strengthening bones, its high resistance to biological stresses, including drought, is one of the important factors in the cultivation of elderberry orchards in the world. The University of Zanjan with more than 440 hectares, as one of the green universities in the world, based on the Green Metric scale, has recently dedicated a part of its garden green spaces to planting elderberry, which is a successful experience for producing fruit from urban green spaces. Our field surveys in different parts of oleaster gardens show that 10-15% of oleaster gardens are infected with sweeping disease, which has challenged the beauty, growth and fruiting as well as the continuation of tree life of the gardens. The development of swollen glands and scabs with a diameter of 3 to 5 cm at the end or middle of the branches and then the growth of more than 5 to 10 thin light branches on the swollen base part were observed as the general characteristics of this disease. The change in shape (deformation) of the stem and branch as well as the drying of the branches are the next results of this disease. The preliminary data and field observations indicate the relationship between this feature of sweeping between the *Elaeagnus angustifolia* and the *Salix babylonica* trees. Considering the intra-tissue contamination of the disease, it seems that the selection of disease-resistant cultivars along with adequate nutrition of orchards is one of the most important ways to deal with this developing disease in oleaster orchards.

Key words: Medicinal tree, sweeping trait, plant breeding.

Effects of stinging nettle (*Urtica dioica L.*) powder on body weight and mortality rate in broilers exposed to chronic heat stress

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Abstract

Heat stress is one of the most prevalent environmental stressors that leads to weight loss, mortality, and economic losses in the poultry industry. Stinging nettle is a medicinal herb with strong antioxidant properties. The present study was conducted to evaluate the effects of dietary stinging nettle at two different levels (2% and 4%) on growth performance and oxidative stress indices of broilers exposed to chronic heat stress. On day 14, a total of 160 broiler chickens were randomly assigned to four treatment groups as follows: 1) NC: negative control; 2) HS: heat-stressed broiler; 3) HS-SN2: heat-stressed broiler fed by 2% dietary stinging nettle; 4) HS-SN4: heat-stressed broilers fed by 4% stinging nettle. Diet supplementation with stinging nettle was performed from days 14 to 29 and a chronic heat stress was induced from days 22 to 29. As a result, body weight gain decreased in the HS compared to the Ctrl, and it increased in the HS-SN2 and HS-SN4 compared to the HS. HS had 5% mortality rate in heat stress period. In conclusion, the addition of stinging nettle powder to the broilers' diet improved the body performance in heat-stressed birds. Furthermore, this herb could be utilized as a feed additive in poultry diet to improve bird's health and defense mechanisms under stressful conditions.

Keywords: Heat stress, Stinging nettle, Body weight, mortality rate, Broilers.

Efficacy of eucalyptus essential oil and extract in controlling of citrus green mold disease

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Abstract

Citrus fruits are used by humans in different ways. Many pests and pathogens threaten the production of these products. The green mold caused by the *Penicillium digitatum* Sacc. fungus is one of the most important disease on different varieties of citrus fruits in storage. In this research, the antifungal activity of *Eucalyptus camaldulensis* essential oil and leaf extract, which has various antimicrobial metabolites such as terpenoids, aldehyde esters, ketones, and aromatic phenols has been investigated. The antifungal effect of eucalyptus essential oil and leaf extract on colony number, spore germination and inhibition of mycelial growth of *P. digitatum* were considered. Extraction of essential oils was carried out by a clevenger machine and extracts were prepared using by a **rotary evaporator** from dried leaf powder. The results showed that the concentration of 5 µl/ml essential oil prohibited colony formation and mycelium growth in the culture medium during fourteen days. As well as, the concentration of 2 µl/ml of eucalyptus essential oil showed the lowest percentage of fungal spore germination compared to the control. Using of 30 mg/ml concentration of eucalyptus extract in the fungus growth medium caused a significant decrease in the number of fungus colonies compared to the control treatment and the other extract concentrations. The results of this research showed that eucalyptus essential oil and extract are good options to replace chemical fungicides.

Key word: *Penicillium digitatum, essential oil, extract and Eucaliptus*

The symbiotic fungus *Serendipita indica* is a potential factor in the induction of different metabolites in medicinal plants

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Abstract

Serendipita indica fungus (synonym *Piriformospora indica*) belongs to Basidiomycete fungi and Sebacinales order, which is known as an entophytic symbiont of various monocotyledonous and dicotyledonous plants roots. This fungus in symbiotic plants leads to the creation of various characteristics such as increasing the growth and biomass of roots and aerial parts, increasing the absorption of water and elements, induction of growth hormones, induction of resistance related genes to pathogens and as a result induction of SAR and ISR mechanisms. In addition, it was also shown in many studies that the increase of different metabolites is significantly observed in symbiotic plants. It was also shown that *S. indica* fungus is able to penetrate the roots of Solenostemon, basil, cumin, artichoke, stevia, mint pepper and a number of other medicinal plants and increases the production and accumulation of different metabolites in different parts. They will be The research results showed that *S. indica* increases the resistance to various biotic and abiotic stresses in symbiotic plants, including medicinal plants, through the induction of different metabolites.

Effects of different concentrations of heavy metals application onsome germination indices of chicory

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Abstract

Heavy metals of biosphere rise since the beginning industrial revolution and the toxicity of heavy metals cause to impair in the process of germination and growth of plants. Medicinal plants are a large group of economically important plants**.** Chicory is a perennial plant that has been used frequently among people of different countries. In this study the effects of the different concentration of Pb $(NO_3)_2$ (0, 50, 100 and 200 mg l^{-1}) and different concentration of $Ni(NO_3)_2$ (0, 50, 100 and 200 mg l^{-1})on germination of chicory were investigated in the independent experiments according to a completely randomized design with forth replication. The results of ANOVA in two experiments indicated a significant difference between different treatments at a level of 5% for most traits. The result indicated that with the increase in concentrations of Pb, radicle and plumule length, radicle and plumule dry and fresh weight, and vigor index showed a downward trend. Increasing the concentration of $Ni(NO_3)_2$ impairs the growth of radicle and plumule length, radicle and plumule dry and fresh weight, vigor index of chicory. In general, the results of this study showed that Ni and Pb may allow plants to germinate, but with increasing in their concentration, the germination indices in some seed of chicory were impaired.

Key words: Chicory, Germination, Ni, Pb

Effects of Pb $(NO_3)_2$ on some morphology characteristics of chicory in aeroponic system

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Abstract

Chicory, is a medicinal plant that the most important use is through the production of leaves and roots. In this research, the effect of the different concentration of Pb $(NO_3)_2$ on some morphology traits of chicory were evaluated in the aeroponic system. This system is a suitable method for investigating the effects of heavy metals in controlled conditions. The treatments were including $Pb(NO_3)_2$ (0, 50, 100 and 200 mg l^{-1}).This study conducted based on the completely randomized design with 5 replications. The results of ANOVA indicated that the effects of treatment were significant for plant height, root length, number and area of leaves, fresh and dry weights of the shoot and root. The results showed that 200 mg $l^{-1}$of $Pb(NO_3)_2$ resulted in the lowest plant height, root length, dry weights of root and shoot and number and area of leaves. The control produced the highest plant height, root length, dry weights of root and shoot, number and area of leaves.

Keywords:Heavy metal,Medicinal plant, Soilless culture

Investigation of folklore therapy based on medicinal plants in the face of covid-19 in Zanjan and Gilan provinces

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Abstract

The use of herbal medicines in the treatment of human ailments has a history of thousands of years. It seems that the passage of early man through health-threatening passes in different eras of the development and evolution of human civilization was due to the knowledge and use of the plants around him, which are generally found to be edible and medicinal by evaluate of the taste, flavor and aroma, etc.

The sudden and global outbreak of Covid-19, which was reported from the initial origin of the city of Wuhan - China, imposed a wave of worry, stress and disease on human societies. Before the human research and thought is formulated and referred in a specific and definite medicinal form, according to the previous knowledge of the human being about medicinal plants, a huge wave of unofficial recommendations and prescriptions to prevent and deal with Corona in the countries of the world, including Iran, side by side was informed. In addition to the simplicity of this process, it is important to summarize local and native beliefs and ideas based on medicinal plants, as well as information about the results of medicinal plant users at this time of the corona virus epidemy. In this research, in addition to case-by-case and random access to the information of those infected with Corona in the health centers of Zanjan and Gilan provinces, in the form of various interview methods, including surveys and... useful information was obtained about the medicinal plants used and the level of consumer satisfaction. According to the results of this study, the medicinal herbs Panerak (*Malva sylvestris*), Barhang (*Plantago lanceolata*), kakuti (*Thymus vulgaris*), Toklujeh *(Stachys lavandulifolia* and Gazaneh - nettle (*Urtica dioica*) are among the main herbs consumed by people affected by this epidemic, and the level of satisfaction of patients in reducing the complications of the disease from the consumption of Kakuti, and Gazaneh plants has been more than other plants. No significant difference was observed in the research results between the two provinces.

Keywords: medicinal plants, herbal medicines, traditional medicine, Covid-19

plant herbarium and its importance in discovering medicinal plants

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Abstract

Herbarium (plural: herbaria) is a collection of dried and named plant samples(medicinal and non-medicinal) that are systematically organized according to a classification system based on family, genus and species, and the samples are available for scientific research. Multiple samples of individual species collected from different habitats are typically preserved. Such a collection is necessary for systematic research and plays an important role in the protection of medicinal plants.Herbarium specimens constitute our most understanding of the patterns of diversity in nature. These collections show morphological variations of populations, species and higher taxa, their geographical distribution and ecological specialities. Also, herbarium samples can be used for pollinology, ultrastructure, micromorphology, and anatomy studies And (if the quality of the sample is suitable) DNA is isolated.in this study,10species of medicinal plants from the Asteraceae famaily were collected from Maragheh city, herbarium and identified (using external and internalidentificationkeys)and also the geographical location of each sample collected by GPSwas registerred.the aim of the researchis to investigate the medicinal value of the collected species and their herbarium method. Also, dried plant samples as scientific documents to show the presence of a species in a specific place (in an environmental or floristic study) or to identify a plant used in an experiment or a plant whose chromosomes have been counted or a DNA sample or A chemical extract is extracted from it and they are used.

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Keywords: Herbarium ،Plant taxonomy ،Plant identification ،Medicinal Plants،DNA،Asteraceae

Investigating the properties of *veronica persica* medicinal plan and its applications in the food industry

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Abstract:

Veronica persica belongs to the Veronicaaceae family, it is an annual and weedy plant that reproduces through seeds. This plant grows next to streams and rivers and has small sky-blue flowers. *Veronica persica* plant grows in large areas of Iran. Different species of this plant have wide traditional uses all over the world and in some regions the stem and leaves are used as food. This plant is rich in bioactive compounds and also has antioxidant, antimicrobial, antifungal, anti-inflammatory activities as well as the ability to inhibit acetylcholinesterase, tyrosinase, lipoxygenase and xanthine oxidase. Artificial preservatives are widely used in various food products. However, there are concerns about their negative effects on human health. Therefore, currently, the use of bioactive compounds as a substitute for synthetic compounds has attracted the attention of many researchers in different food and drug industries as natural preservatives. Therefore, recovery and use of vital valuable compounds of this plant can be a suitable option for use in food and pharmaceutical industries. In this study, the properties of the medicinal plant *Veronica persica* and some of its uses in the food industry will be discussed.

Keywords: *Veronica persica*/ antioxidant compounds/ bioactive compounds/ food industry/ Food shelf life

Study of Changing of Secondary Metabolites in Medicinal Plants of Thymus and Artemisia

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Abstract

Secondary metabolites are substances that are present in some plants and in a certain vegetative stage of growth, by examining the changes in these substances in two pasture plants, Derme and Thyme, at three altitude levels and three dry, semi-arid and semi-humid climatic regions, which were analyzed and analyzed. Statistical analysis with statistical software, we achieved a new index to evaluate the intensity and use it for drought zoning. This index shows that with the increase of drought intensity, the amount of secondary metabolites in different species and in different vegetative stages increases significantly.

Key words: Medicinal plants, secondary metabolites, herbs, *Thymus*, *Artemisia.*

Evaluate effects of N.P.K fertilizer different levels and rhizome weight on ginger (Zingiber officinale) adaption and yield and quality properties

Sayed Milad Shohadae, Gholamali Akbari

Abstract

In order to evaluate the effects of different amounts of NPK fertilizer and rhizome weight on the adaptability and quantitative and qualitative yield including gingerol and shogaol in ginger plant (Zingiber officinal), an experiment was conducted in the greenhouse complex of Abureyhan College of Tehran University in 1400, in a factorial form in the form of a design Complete randomized blocks were performed. Different levels of chemical fertilizer in four levels, including: A: No use of fertilizer. (control treatment) (b0) B: consumption of 40 kg N, 15 kg of P and 30 kg of K (b1) C: 100 kg of N, 30 kg of P and 60 kg of K (b2). D: 150 kg of N, 45 kg of P and 75 kg of K (b3). Different weights of ginger rhizome in three levels including: 45 grams (a1), 60 grams (a2) and 75 grams (a3). The experiment was performed in three replicates. The results showed that there is a significant relationship between increasing the amount of fertilizer and rhizome weight and the relationship is super-linear. Also, the most essential oil compounds (beta bisabolenol compound) were observed in the a3b3 treatment and the amount was 43 mg, and no significant difference was observed in the other treatments in terms of other investigated compounds.

keywords: Chemical fertilizer, gingerol, quantitative and qualitative performance, shogaol, Zingiber officinal

An overview of asparagus plant focusing on its medicinal properties and nutritional value

Pouya Tahekhani, Farzan Taheri, Mohammad Rsouli, Ali Ammarelou

Abstract

Asparagus with the scientific name Asparagus officinalis L. var. altilis belongs to the Asparagaceae family. Asparagus plant is used both fresh and dry in various foods and as a useful herbal medicine in Asian and European medicine. The Greeks used it as a vegetable in ancient times, but in fact the Romans were the first people to develop the agricultural operations for growing asparagus and wrote the instructions for its cultivation. Asparagus has two types of aerial stems, one is edible and has no leaves, and the second is aerial stems that have leaves and are non-edible. The name of amino acid asparagine is derived from asparagus, the Latin name of asparagus, because asparagus is very rich in this amino acid. Asparagus is native to temperate regions and is a cool season plant. Asparagus has folic acid, aspartic acid, folate, saponin, protodiosin, rutin, glutathione, vitamins A, C, B1, B2, B3, B5, B6, E, zinc, magnesium, iron, potassium, calcium and fiber. Asparagus chemical compounds include saponins, flavonoids, hydroxycinnamic acids, sulfuric acids, amino acids, anthocyanins, volatile oils, resins, tannins, and fructans. Asparagus plant is effective in improving facial acne, toothache relief, migraine relief, stomach ulcer treatment, liver disorders, breast cancer, blood cancer, dysentery and blood cholesterol control. This plant is used to increase breastfeeding of mothers, treat cough, treat inflammatory diseases of the urinary tract, kidney diseases, rheumatism, control high blood pressure and blood lipids. Asparagus plant is effective in cardiovascular diseases and has anti-fungal and anti-bacterial effects. This plant is also used in the treatment and control of diabetes. Carrot has antioxidant properties.

Keywords: Asparagus, therapeutic properties, medicinal properties, nutritional value, chemical compounds

Investigating the effect of alcoholic extract of Ansal onion (Urginea maritime) on reducing muscle and joint pain

Hamidreza Shojaei

Abstract

Ansal onion (Urginea maritime) from Liliaceae family, a medicine that is used from the heart to local pain relief, and cloves (Syzygium aromaticum) are used for hair loss, nose and throat pain, gastritis and side and stomach pain, Aloe Vera. vera) in order to heal wounds and cracks on the hands and feet, etc., the use of products that can have any of these features and examine them in this article, a combination of wonderful products, how to make a spray We explain

Prioritization of medicinal plants that can be cultivated sustainably in Bam region using multi-criteria decision-making methods

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Abstract

The growing trend of the population in the country, as well as the lack of medicine and especially the side effects of chemical medicines, forces people to interfere in natural resources. Medicinal plants and their by-products are of interest from an economic-social point of view, as well as job creation. Medicinal plants of Bam city were collected and identified with the aim of potential and actual power of this city, in order to obtain the necessary information and context to carry out other studies and plans. Implementation plans should be provided. Using field and survey methods, the medicinal plants of this study were collected and habitat information of the plants of Bam city was recorded in the relevant forms, and after examining and identifying sustainable medicinal plants in Bam city, they were prioritized. First, the desired medicinal plants and criteria have been identified using the fuzzy Delphi method. Then, the weight of each criteria has been determined using Rough dematel and Rough ANP, and medicinal plants have been prioritized using Rough Topsis and Rough Aras techniques. The results of the two methods showed that angouzeh, licorice, and cumin plants ranked first to third in cultivation in the region, respectively.

Key word: Sustainable agriculture, environmental factors, medicinal plants, multi-criteria decision making models

The effect of Nanozeolite on morphological and physiological properties of *rosa damascene*

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Abstract

Damask rose is a plant with medicinal-industrial value, and its prominent trait is an adaptation to drought. In order to investigate the effect of drought stress on vegetative growth and physiological characteristics of Damask rose, a factorial potted experiment was conducted in a randomized complete block design with three replicates. Treatments include three levels of Nanozeolite and four Irrigation intervals, which were performed in a roofed space with sufficient light. After determining the field capacity and soil wilting point, the reference weight was determined in terms of field capacity and drought treatments were applied based on soil moisture. Various morphological factors, including diameter growth, seedling height, leaf number, leaf area, aerial and terrestrial biomass, were determined after applying stress. Statistical analysis of data was performed using EXCEL and SPSS software. The results indicated that the highest total plant weight and shoot dry weight were obtained in 10g Nanozeolite treatment and irrigation interval four days. The interaction effect of Nanozeolite and irrigation intervals on fresh and dry leaf weight was significant and reached its maximum in 10g Nanozeolite and irrigation interval four days treatments. Nanozeolite affected the number, length, volume, and dry weight of Damask rose root significantly, and consumption of 10g of Nanozeolite improved these traits. Irrigation intervals significantly affected all measured traits except shoot dry weight, the number of roots, plant height, and leaf relative water content. In general, it can be concluded that the use of Nanozeolite in low concentrations has improved growth indices and the application beyond the desired limit for the drought-tolerant Damask rose plant has adverse effects

Key words: Drought stress, vegetative growth, survival, rosa damascena

in Silico Investigation of HDAC inhibitor properties of the Barijeh

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Background: Ferula gummosa is a popular medicinal plant with various properties. Its gum resin is called Barijeh in Persian. Histone deacetylases (HDACs) have emerged as effective therapeutic targets in the treatment of various diseases including cancers, we investigated the HDAC inhibitor properties of the main composition of Ferula gummosa, Beta-pinene.

Methods: The chemical structure of Beta-pinene was designed and optimized by using HyperChem software. The protein X-ray crystal structure of Histone deacetylase was received from Protein Data Bank. ligand docked with Histone deacetylase 8 Human HDAC8 (PDBID: 1T69) using AutoDock 4.2 software.

Results: Based on the docking results the studied ligand showed the lowest binding energy level (-4.4881 kcal/mol), and hydrophobic-bonding with Lys33, Met274, Tyr30 and Phe 152 which is important for HDAC8 inhibition.

Conclusion: The *insilico* molecular docking study revealed that studied compund, have good affinity toward Histone deacetylase as an inhibitor. For additional investigations, the effect of these herbal compounds can be analyzed in invitro and invivo conditions.

Keywords: Beta-pinene, Barijeh, inhibition, histone deacetylase, enzyme

Using Drones Technology in Identifying Medicinal Plants and Mountain Mushrooms and Providing their Database

Zahra Khoshnodifar, Parviz Rahimi Moslehabadi, Radmehr Rahimi Moslehabadi

Abstract

Drones are one of the latest agricultural equipment and tools recently imported into agricultural areas. They are small drones that use remote control or fly over crop farms using pre -planned flight routes. They are equipped with a wide range of cameras with sensors in visual spectral bandwidth, near infrared or infrared, providing accurate images of farms, rangelands, natural areas, forests, soil status, crop growth and grain formation (Jin et al.,2009; Wang and Wu, 2010; Wang, 2010; Salami et al., 2014). An activity that has never been possible during the past millennium. Digital images and data provided by drone sensors are not possible with manpower. There are the first at that rapidity, accuracy and cost. Drones cover on an average 50–250 ha in an hour. Drones are at least 50 times faster than ground surveys done by skilled technicians on similar sized locations (Novodrone, 2014; Trimble Navigation Systems,2014; Trimble, 2015). The spectral data from drones and their computer decision -making system can be very helpful in identifying, detecting and separating different species of medicinal plants and mountain mushroom, generally in impassable and out of reach of humans. They have the ability to shoot in colored infrared wavelength (CIR)1 , thermal infrared (TIR)2 and visual NIR (VNIR)3 and the use of object -based analysis (OBIA)4 and the use of high quality spectral sensors can be different species of medicinal plants and identify and locate mountain mushroom with a spectral reflection pattern.This feature is tested in identifying different species of weeds in different countries.

Investigating the effect of ginseng, saffron, violet and ginger plant extracts on Staphylococcus aureus bacteria in laboratory conditions and animal model

Sena Moin, Mojtabi Mohammadi Roknabadi, Rasul Shukri

Abstract

Today, infectious and microbial diseases form a large group of diseases, and on the other hand, the number of microbial isolates resistant to antibiotics is increasing day by day, so the need for new and less harmful antibacterial substances is becoming more apparent every day. Medicinal plants are rich in significant antimicrobial properties, so they can be used to delay or prevent the growth of pathogenic or spoilage microorganisms. In this study, we investigated the effect of extracts of Ginseng, Echinacea, Violet and Ginger on Staphylococcus aureus bacteria in laboratory conditions and animal model. In this experimental study, plant extracts were extracted by soaking method and their effect on the growth of Staphylococcus aureus in nutrient agar medium was investigated. In order to investigate the effects of these extracts in the living organism, mouse models of Staphylococcus aureus wound infection were created and the effect of treating these wounds with plant extracts was evaluated. The observation method was used to analyze the qualitative data. According to the data analysis, the MIC values for the extracts of ginseng, ginger, violet and Echinacea are equal to 0.17, 0.20, 0.32, and 0.72 µg/ml, respectively, and the MLC index for these extracts. It was 0.34, 0.40, 0.64, and 1.44 µg/ml, respectively. According to the results obtained from this study, it can be concluded that the extracts of ginseng, ginger, violet and Echinacea in different formulations have good antibacterial effects against Staphylococcus aureus bacteria. But in the end, by summarizing the data, it can be concluded that ginseng and ginger plants had more antibacterial effect than others, and Echinacea had the least effect. The present study is one of the few studies that investigated the effect of ginseng, Echinacea, violet and ginger on Staphylococcus aureus infection.

Key words: ginseng, Echinacea, violet, ginger, Staphylococcus aureus bacteria, animal model

Marketing analysis of licorice Glycyrrhiza glabra and Astragalus verus

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professor and master student of Ferdowsi University of Mashhad, respectively

Abstract:

Rangelands are one of the most important and vital sources of human needs. Among the benefits of these areas should be noted the natural growth of beneficial plants. Exploitation in order to provide suitable products of medicinal and industrial plants, including the most important by-products of the country's rangelands and a suitable alternative to oil revenues in the country. For this purpose, in this research, two widely used medicinal and industrial plants, licorice Glycyrrhiza glabra and Astragalus verus tragacanth, are introduced from the perspective of medicine and marketing. During this study, questionnaires were prepared in the field from several wholesalers and exporters of micro plants in a field method and the results of the questionnaires were analyzed with SPSS software version 16.According to the conclusion he results of the mentioned study show that one of the major problems of the retail and wholesale market of Astragalus verus and Glycyrrhiza glabra is the lack of standard and quality product in the market; Bulk, unsanitary and interference in the process of selling the product, lack of proper processing and packaging, lack of fixed prices in the market per kilogram of product, insufficient information of sellers about the purchase of the product by retailers and finally the existence of profiteering brokers is.

Keywords: Marketing, Medicinal Plants, Rangelands, Non-Oil Income

Economy of medicinal plants in Iran and the world

Alireza Karbasi

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Abstract

Economic development and diversification of production and export incomes are very important. In this regard, it is necessary to pay attention to the products that have potential for their production and export. Among these products, medicinal plants can be mentioned, the increase in global and domestic demand for them, due to the increase in consumer interest in herbal and traditional medicines, has created a huge business at the national, regional and international levels. Therefore, while analyzing the economic components of production, export, trade, value chain and processing of medicinal plants in important countries in the world, their opportunities are examined. Despite the abundance of capacity, Iran's official export of medicinal plants and their products is mainly related to raw products, and this export has not had a constant increase and development trend. Among the identified problems in the field of financial plants trade, we can point out the weakness in branding and packaging, raw sales and the unknown nature of Iranian products. Therefore, it is important to support the private sector for the production, processing, packaging and export of medicinal plants, as well as compliance with international standards in the production of medicinal plants to be present in the global market, as well as market assessment and target market identification in order to effectively participate in the international trade of medicinal plants.

Key words: export, production, medicinal plants, Iran

Investigating the Supply chains and medicinal plant market of Barijeh

Alireza Karbasi and Fatemeh Mahjoub

Professor and master student of Ferdowsi University of Mashhad, respectively

Abstract

Medicinal plants are one of God's gifts, and if a basic planning is done in the way of production and marketing, it can, in addition to treating diseases, create productive employment, prevent the destruction of forests and pastures, and preserve the environment. Marketing of products is one of the major problems in the path of the expansion of medicinal plants in the direction of economic development in Iran. Correct marketing makes the products to be produced according to the needs of the consumers and provided to them in a healthy and desirable way. Due to the special characteristics of medicinal plants such as perish ability, seasonal production and volume, the marketing of its products is highly sensitive. Marketing operations include storage, transportation, grading, packaging and conversion. Producers, intermediaries and consumers play a major role in the marketing organization.

Studying the marketing system of medicinal plants is necessary to find solutions to improve the market situation. Considering the importance of medicinal plants in the domestic economy and the potential of North Khorasan province in the production of medicinal plants, the purpose of this study is to investigate the production chain and market of medicinal plants in North Khorasan province. For this purpose, the margin values of retail, wholesale and exploitation were investigated. The required information was collected by completing a questionnaire at the levels of medicinal plant operators, retailers, and wholesalers in North Khorasan province in 2021.

Keywords: market, production, medicinal plants, North Khorasan

Investigating the effect of density and nutrition on the yield of *Saturjia mutica* in the dry conditions of East Azerbaijan province.

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Abstract

In order to investigate the effect of density and nutrition on the yield of *Satureja mutica*, research was conducted from 2016 for 4 years in the dry conditions of Tikeme Dash Research Station of East Azerbaijan Province. The experimental design was a split-split plot based on a randomized complete block design with three replications. The main treatment includes feeding at three levels of cow manure, straw and control (without the use of any fertilizing substances) and the secondary treatment includes the planting distance at three levels of 25, 50 and 75 cm on the row, equivalent to 66,666 plants per hectare, 40,000 plants per hectare, respectively. and there were 26,666 plants per hectare. The studied characteristics include plant height, canopy area, dry matter yield, dry weight of a single plant, wood weight of a single plant, leaf weight of a single plant, beginning of flowering, peak flowering, number of plant stems, percentage of essential oil, yield of essential oil, number of days to the beginning of flowering, the number of days until the seed ripening and plant establishment were measured and recorded. Variance analysis of morphological traits data was done. Means were compared using Duncan's test. The analysis of the results showed that in most of the studied traits, straw bedding was superior to manure bedding, so that the dry yield increased by 226.6 kg/ha compared to manure and 342 kg/ha compared to the control, which showed that it was more storage of precipitation moisture in straw bedding. returns in order to harvest a high yield and obtain more essential oil, it is recommended to use straw bedding × 25 cm planting density for the development of *Satureja mutica* species in the dry conditions of Tikeme Dash station.

Key words: Medicinal plants, dry farming, performance, mountain salt, essential oil

بررسی علف‌کش‌های مختلف برای کنترل انتخابی علف‌های هرز مزارع گیاه دارویی گشنیز (*Coriandrum sativum*)

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چکیده

گشنیز (Coriandrum sativum) از جمله گیاهان دارویی پرطرفدار است که به علت دوران کوتاه رشد و نمو می‌توان چند بار در سال از آن محصول برداشت کرد. با این حال فقدان علف کش‌های اختصاصی ثبت شده محدودیت اصلی برای کنترل موثر علف‌های هرز و در نتیجه تولید موفق این محصول بشمار می‌رود. به این منظور آزمایش‌هایی با هدف ارزیابی علف‌کش‌های پیش‌رویشی و پس‌رویشی برای کنترل انتخابی علف‌های هرز مزرعه گشنیز (Coriandrum sativum) در دانشگاه زنجان و مرکز تحقیقات کشاورزی و منابع طبیعی همدان در سال 1401 اجرا گردید. در این مطالعه از علف‌کش پندیمتالین (Prowl 45/5 % CS) بصورت پیش‌رویشی و همچنین علف‌کش اکلینوفن (Aclonifen) استفاده گردید. تیمارها شامل: 1) کاربرد ۲ لیتر در هکتار علف‌کش پیش‌رویشی پندیمتالین، 2) 3 لیتر در هکتار علف‌کش پیش‌رویشی پندیمتالین، 3) ۲ لیتر در هکتار علف‌کش اکلینوفن بصورت پس‌رویشی، 4) 3 لیتر در هکتار علف‌کش اکلینوفن بصورت پس‌رویشی، 5) 1/5 لیتر اکلینوفن بصورت پیش رویشی به اضافه 1/5 لیتر پس رویشی، 6) 2 لیتر اکلینوفن بصورت پیش رویشی به اضافه 2 لیتر پس رویشی، 7) کاربرد پرول ۲ لیتر بعلاوه پس رویشی ۲ لیتر اکلینوفن، 8) کاربرد پیش رویشی پرول ۲ لیتر و پس رویشی ۱.۵ لیتر اکلینوفن، 9) شاهد تداخل و 10) شاهد عاری از علف هرز بودند. نتایج تجزیه واریانس داده‌ها حاکی از تاثیرگذاری تیارهای مختلف بر صفات مورد ارزیابی بود. کاربرد

لیتر علف‌کش پرول بعلاوه ۲ لیتر اکلینوفن بیشترین تاثیرگذاری بر علف‌های هرز را از خود نشان داد. به نحوی که در این تیمار حداقل وزن‌تر (0/35 کیلوگرم در مترمربع) و وزن خشک (0/036 کیلوگرم در مترمربع) مشاهده گردید. بیشترین تراکم علف هرز نیز در تیمار شاهد با 256 بوته در مترمربع و کمترین تراکم بوته علف هرز در تیمار ۲ لیتر علف‌کش پرول بعلاوه ۲ لیتر اکلینوفن با 32 بوته در مترمربع مشاهده شد. بیشترین عملکرد بیولوژیکی گشنیز در تیمار کاربرد پیش رویشی پرول ۲ لیتر و پس رویشی 2 لیتر اکلینوفن با حدود 2/26 کیلوگرم در مترمربع برآورد شد. به طور کلی، کاربرد ۲ لیتر علف‌کش پرول بعلاوه ۲ لیتر اکلینوفن بصورت پس‌رویشی قادر به کنترل دامنه وسیعی از علف‌های هرز باریک برگ و پهن برگ مزارع گشنیز باشد و از طرفی هم ایمنی محصول را تا حد زیادی فراهم کند.

کلمات کلیدی: اکلینوفن، پندی‌متالین، سلمه‌تره، عملکرد بیولوژیکی، گشنیز، گیاه دارویی

ارزیابی علف‌کش‌های پیش رویشی و پس رویشی برای کنترل انتخابی علف‌های هرز مزرعه گیاه دارویی شنبلیله (*Trigonella foenum*-graecum)

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چکیده

اخیراً کشت شنبلیله (*Trigonella foenum*-graecum) به دلیل استفاده بالقوه غذایی و دارویی آن در حال افزایش است. با این حال فقدان علف‌کش‌های اختصاصی ثبت شده محدودیت اصلی برای کنترل موثر علف‌های هرز و در نتیجه تولید موفق این محصول بشمار می‌رود. به این منظور آزمایش‌هایی با هدف ارزیابی علف‌کش‌های پیش‌رویشی و پس‌رویشی برای کنترل انتخابی علف‌های هرز مزارع شنبلیله (Trigonella foenum-graecum) همزمان در دانشگاه زنجان و مرکز تحقیقات کشاورزی و منابع طبیعی همدان در سال 1401 اجرا گردید. در این مطالعه از علف‌کش پندیمتالین (Prowl 45/5 % CS) بصورت پیش‌رویشی و همچنین علف‌کش اکلینوفن (Aclonifen) استفاده گردید. تیمارها شامل: 1) کاربرد ۲ لیتر در هکتار علف‌کش پیش‌رویشی پندیمتالین، 2) 3 لیتر در هکتار علف‌کش پیش‌رویشی پندیمتالین، 3) ۲ لیتر در هکتار علف‌کش اکلینوفن بصورت پس‌رویشی، 4) 3 لیتر در هکتار علف‌کش اکلینوفن بصورت پس‌رویشی، 5) 1/5 لیتر اکلینوفن بصورت پیش رویشی به اضافه 1/5 لیتر پس رویشی، 6) 2 لیتر اکلینوفن بصورت پیش رویشی به اضافه 2 لیتر پس رویشی، 7) کاربرد پرول ۲ لیتر بعلاوه پس رویشی ۲ لیتر اکلینوفن، 8) کاربرد پیش رویشی پرول ۲ لیتر و پس رویشی ۱.۵ لیتر اکلینوفن، 9) شاهد تداخل و 10) شاهد عاری از علف هرز بودند. نتایج حاکی از آن بود که بیشترین وزن‌تر (1/8 کیلوگرم در مترمربع) و وزن خشک (0/215 کیلوگرم در مترمربع) علف‌های هرز در تیمار شاهد مشاهده گردید. در مقابل کمترین وزن خشک علف‌های هرز (0/041 کیلوگرم در مترمربع) در تیمار کاربرد پیش رویشی پرول ۲ لیتر و پس رویشی ۱.۵ لیتر اکلینوفن بدست آمد. بیشترین عملکرد بیولوژیکی شنبلیله در تیمار کاربرد پیش رویشی پرول ۲ لیتر و پس رویشی ۱.۵ لیتر اکلینوفن با حدود 1/95 کیلوگرم در مترمربع برآورد شد. به طور کلی، کاربرد علف‌کش پیش رویشی پرول ۲ لیتر و پس رویشی ۱.۵ لیتر اکلینوفن می‌تواند هم کنترل دامنه وسیعی از علف‌های هرز و هم ایمنی محصول را فراهم کند.

کلمات کلیدی: پندی‌متالین، علف هرز، عملکرد بیولوژیکی، شنبلیله، گیاه دارویی

تعیین الزامات معرفی ارقام جدید گیاهان دارویی اولین حلقه در زنجیره صنعت گیاهان دارویی

فرهاد خیری صنمی

موسسه تحقیقات ثبت و گواهی بذر و نهال

گیاهان دارویی از جمله گیاهانی هستند که اهمیت روزافزونی در حفظ و بهبود سلامت انسانها از یکسو و ایجاد اشتغال و ارزش افزوده اقتصادی از سوی دیگر دارند. حجم تجارت جهانی گیاهان دارویی سالیانه بیش از 43 میلیارد دلار است که پیش بینی میشود این میزان تا سال 2050 به رقم 5 تریلیون دلار افزایش پیدا نماید. سهم کشورمان از بازار تجارت گیاهان دارویی جهان با احتساب زعفران در سال 1397 به حدود 600 میلیون دلار رسیده است. این رقم با توجه به پتانسیل موجود در کشور رقم قابل توجهی به شمار نمیرود. این در حالی است که کشورمان دارای مزیت های نسبی بسیار زیادی در در گیاهان دارویی بوده و بسیاری از این گیاهان بومی و انحصاری ایران به شمار میروند. کشت و اهلی کردن و اصلاح گونه های بومی با مزیت نسبی بالا همگام با توسعه صنایع مرتبط با گیاهان دارویی از جمله راه کارهای مناسب برای ایجاد ارزش افزوده همراه با حفظ گونه های بومی با ارزش کشور میباشد. ورود گونه های اصلاح شده به چرخه تولید مستلزم تولید و عرضه بذر این گونه ها در کشور میباشد. این امر به نوبه خود نیازمند وجود سازوکاری برای معرفی ارقام اصلاح شده گونه های مذکور در نظام معرفی رقم کشور میباشد. در آیین نامه کنونی معرفی رقم در تبصره 5 ماده 2 تعیین سازوکار معرفی ارقام گیاهان دارویی را بر عهده کمیته معرفی رقم گذاشته است. با توجه به تنوع گونه های گیاهان دارویی و تنوع نوع مصرف آنها تعیین سازوکار واحد برای کلیه گیاهان دارویی منطقی نبوده و امکانپذیر نمیباشد. یکی از پیش نیازهای اولیه برای تدوین سازوکار معرفی ارقام گونه های گیاهان دارویی، تقسیم بندی آنها بر اساس نوع تولید یا مصرف میباشد. در این تقسیم بندی گیاهان دارویی به سه دسته ذیل تقسیم شده و سپس بر اساس این تقسیم بندی دستورالعمل لازم برای معرفی ارقام هر کدام از گونه های موجود در این دسته ها تهیه میگردد. گونه هایی که به شکل زراعی تولید میشوند، 2-گونه هایی که مانند ارقام سبزی و صیفی مصرف میشوند و 3 - گونه هایی که در تولید آنها صرفا مواد موثره موجود در آنها دارای اهمیت اصلی میباشد. بدیهی است اساس تهیه سازوکار معرفی ارقام گیاهان دارویی در هر سه دسته فوق تهیه شناسنامه مورفولوژیک با رویکرد داشتن تمایز نسبت به سایر ارقام و برخورداری از یکنواختی و پایداری در صفات مورفولوژیک میباشد. در مرحله بعد با توجه به نوع تولید یا مصرف صفات زراعی و یا صفات تکنولوژیک بسته به نوع گونه تعیین کننده سازوکار مذکور میباشد.

کلمات کلیدی: گیاهان دارویی، ارقام جدید گیاهی، زنجیره ارزش گیاهان دارویی،

بررسی اثر هالوپرایمینگ بر تغییرات جوانه‌زنی و رشد اولیه گیاهچه گاوزبان اروپایی

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چکیده:

جوانه‌زنی غیریکنواخت، سبز کردن و استقرار ضعیف و رشد کند از مشکلات تولید در گیاهان دارویی است. از روش‌های افزایش و تحریک جوانه‌زنی، تکنیک پرایمینگ می‌باشد. جهت بررسی اثر پرایمینگ بذر گاوزبان اروپایی با نمک‌های سولفات پتاسیم، کلرید پتاسیم و نیترات پتاسیم در غلظت‌های صفر، 10، 20 و 30 میلی مولار آزمایشی در آزمایشگاه و گلخانه انجام گردید. استفاده از هر سه نمک موجب افزایش درصد، سرعت و شاخص جوانه‌زنی و سبز کردن، گردید؛ و در مقابل بازه زمانی جوانه‌زنی و سبز کردن کاهش پیدا کرد. بیشترین اثر در بین نمک‌های مورد استفاده از کاربرد نیترات پتاسیم و سپس سولفات پتاسیم در غلظت 20 میلی مولار به دست آمد. استفاده از کلرید پتاسیم تنها در غلظت 10 میلی مولار اثر مناسبی در افزایش صفات مورد مطالعه داشت. گیاهچه‌های حاصل از بذرهای پرایم شده، به ویژه، با نیترات پتاسیم دارای تعداد برگ، سطح برگ، وزن خشک، ارتفاع و محتوای آب نسبی بیشتری بودند.

کلمات کلیدی: درصد سبز، سطح برگ، نیترات پتاسیم، محتوای نسبی آب.

اهمیت گیاه دارویی همیشه بهار (*Calendula officinalis*) در صنعت غذا

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چکیده

گیاه همیشه بهار با نام علمی *Calendula officinalis* L. متعلق به خانواده Asteraceae است. این گیاه در سراسر جهان با توجه به ترکیبات فعال زیستی و ارزش دارویی در مقیاس تجاری کشت داده می‌شود. در ایران این گیاه بومی بخش‌های غربی و شمال غربی است. مواد موثره زیست‌فعال فنولی گیاه همیشه بهار نظیر کوئرستین، کلروژنیک اسید و کافئیک اسید به دلیل دسترسی آسان، هزینه ارزان و غیر سمی بودن از بهترین ترکیبات ضد اکسایشی و ضد میکروبی طبیعی بشمار می‌روند. به علاوه پیشگیری از سرطان، تومور و بیماری‌های قلبی عروقی، افزایش عملکرد سیستم ایمنی بدن، مهار اتواکسیداسیون چربی‌های سلولی و حفاظت در برابر صدمات سلولی ناشی از اکسایندهها از مزایای گزارش شده برای این گیاه می‌باشد. از طرف دیگر، با توجه به کاربرد گسترده و اثرات منفی ترکیبات ضد اکسایش مصنوعی، تقاضای مصرف کنندگان برای تولید مواد غذایی عاری از افزودنی‌های مصنوعی و دارای اثرات سلامت‌بخش رو به افزایش است. از این رو در سالیان اخیر توجه محققان صنعت غذا به شناسایی منابع غنی از ترکیبات زیست‌فعال و ارائه راهکارهای مفید جهت جداسازی آنها و افزودن آنها به محصولات غذایی مختلف معطوف شده است. در این مطالعه به معرفی و بررسی کاربردهای مفید این گیاه دارویی در صنعت غذا پرداخته خواهد شد.

کلمات کلیدی: همیشه بهار، ترکیبات زیست‌فعال، فعالیت‌های بیولوژیک، صنعت غذا

بررسی اثر عصارهٔ برگ گیاه عشقه بر روی بی دردی در موش سوری نر (mice) به روش تست فرمالین

مژگان انصاری - سیما سبزه خواه

چکیده

درد حسی ناخوشایند و تجربه‌ای احساسی همراه با آسیب بافتی واقعی می‌باشد. مصرف مکرر داروهای شیمیایی برای کاهش درد منجر به ایجاد تحمل به اثر ضد دردی آن‌ها باعث کاهش درد در کمترین زمان می‌گردد. شماری از ترکیبات گیاهی در درمان و کنترل درد مورد استفاده قرار می‌گیرد. از سوی دیگر عوارض جانبی داروهای شیمیایی و گرانی آن‌ها سبب گرایشی مجدد مردم به طب گیاهی شده است. هدف از این مطالعه تعیین اثر ضد دردی عصاره برگ گیاه عشقه در موش سوری (mice) نر به روش تست فرمالین و مقایسه آن با داروهای شیمایی استامینوفن می‌باشد.

در این تحقیق از ۲۰ سر موش سوری (mice) استفاده شده و حیوانات در گروه‌های ۴تایی نگهداری می‌شدند. در این تحقیق از ۵ گروه شامل، گروه شاهد یا کنترل، گروه‌های دریافت دوز (20، 30، 50 mg/kg) عصاره عشقه و گروه دریافت کنندهٔ ۱۰ cc استامینوفن 500 میلی گرم و از فرمالین برای ایجاد درد در موش‌ها استفاده گردید. ابتدا درد را توسط فرمالین به چای چپ موش تزریق زیرجلدی کرده و سپس بجز گروه کنترل بقیه گروه‌ها دوزهای ذیل شده را تزریق زیر جلدی نموده و برای سنجش درد در دستگاه تست فرمالین قرار دادند.

معیارهای اندازه‌گیری درد تست فرمالین شامل، لیسیدن پا، پرش jumping، ادرار و مدفوع می‌باشد. با توجه به نتایج بدست آمده مشخص گردید که دوز (50 mg/kg) در مقایسه با دوزهای (20، 30 mg/kg) اثرات ضد دردی بیشتری را نشان داده و دوز (mg/kg 50) تقریباً اثر ضد دردی استامینوفن 10cc ، 500 میلی گرم را نشان داد. بنظر می‌رسد عصارهٔ عشقه بطور مستقیم به وسیله نوروترانسمیترهایی نظیر سروتونینی هسیتامین، پروسوگلاندین‌ها ایجاد شده است. چرا که همه این نوروترانسمیترها با نرون‌های عصبی دردزایی محیطی در ارتباط می‌باشند و همچنین اثرات ضد دردی گیاه عشقه بخاطر ترکیبات فلاونوییدها می‌باشد که اثرات ضد دردی و ضد التهابی دارد و احتمالا این اثرات از طریق فعال کردن مسیر اوپیدپیدی می‌باشد.

کلمات کلیدی:درد – گیاه عشقه – گیاهان شفابخش – موش سوری (mice) نر – دستگاه تست فرمالین

مروری بر گیاه مارچوبه با تمرکز بر خواص درمانی و ارزش غذایی آن

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چکیده

مارچوبه با نام علمی *Asparagus officinalis* L. از خانواده Asparagaceae می باشد. گیاه مارچوبه هم به صورت تازه و یا خشک در انواع غذاها و هم به عنوان یک داروی گیاهی مفید در طب آسیایی و اروپایی استفاده می شود. یونانی ها در قدیم به عنوان سبزی از آن استفاده می کردند ، اما در واقع رومی ها اولین افرادی بودند که عملیات زراعی برای کشت مارچوبه را توسعه دادند و دستورالعمل کاشت آن را نوشتند. مارچوبه دو نوع ساقه هوایی دارد ، یکی ساقه هایی است که مصرف خوراکی داشته و برگ ندارد و دوم ساقه هوایی است که دارای برگ بوده و غیر خوراکی است. نام اسید آمینه آسپاراژین از آسپاراگس، نام لاتین مارچوبه گرفته شده است زیرا مارچوبه از نظر این اسید آمینه بسیار غنی است. مارچوبه بومی نواحی معتدل بوده و یک گیاه فصل خنک می باشد. مارچوبه دارای اسید فولیک ،اسید اسپاراتیک ، فولات ، ساپونین ، پروتودیوزین ، روتین ، گلوتاتیون ، ویتامین آ ، ث ، ب1 ، ب2 ، ب3 ، ب5 ، ب6 ، ای ، روی ، منیزیوم ، آهن ، پتاسیم ف کلسیم و فیبر است. از جمله ترکیبات شیمیایی مارچوبه می توان به ساپونین ، فلاونویید ها ، اسید های هیدروکسی سینامیک ،اسید های گوگردی ، اسید های آمینه ، آنتوسیانین ها ، روغن های فرار ، رزین ، تانن و فروکتان ها اشاره کرد. گیاه مارچوبه در بهبود آکنه صورت ، تسکین دندان درد ، تسکین میگرن ، درمان زخم معده ، اختلالات کبد ، سرطان پستان ، سرطان خون ، اسهال خونی و کنترل کلسترول خون موثر است. از این گیاه برای افزایش شیر دهی مادران ، درمان سرفه ، درمان بیماری های التهابی دستگاه ادرای ، بیماری های کلیوی ، روماتیسم ، کنترل فشار خون بالا و چربی خون استفاده می شود. گیاه مارچوبه در بیماری های قلبی و عروقی موثر بوده و دارای اثرات ضد قارچی و ضد باکتریایی است. از این گیاه در درمان و کنترل دیابت نیز استفاده می شود.مارچوبه دارای خاصیت آنتی اکسیدانی است.

کلمات کلیدی: مارچوبه ، خواص درمانی ، خواص دارویی ، ارزش غذایی ، ترکیبات شیمیایی

بررسی اثر عصاره گیاهان جنسینگ، سرخارگل، گل بنفشه و زنجبیل بر روی باکتری استافیلوکوکوس اورئوس در شرایط آزمایشگاهی و مدل حیوانی

سنا معین - مجتبی محمدی رکن آبادی - رسول شکری

چکیده

امروزه بیماری های عفونی و میکروبی دسته بزرگی از بیماری ها را تشکیل می دهند و از طرفی شمار جدایه های میکروبی مقاوم به آنتی بیوتیک ها روز به روز بیشتر می شود، لذا نیاز به مواد ضد باکتریایی جدید و کم ضرر هر روز بیشتر نمایان می گردد. گیاهان دارویی غنی از خواص ضد میکروبی قابل توجهی هستند، بنابراین می توان جهت به تاخیر انداختن یا ممانعت از رشد میکروارگانیسم های بیماری زا یا عامل فساد استفاده کرد. در این مطالعه تاثیر عصاره گیاهان جنسینگ، سرخارگل، گل بنفشه و زنجبیل بر روی باکتری استافیلوکوکوس اورئوس در شرایط آزمایشگاهی و مدل حیوانی مورد بررسی قرار دادیم. در این مطالعه تجربی، عصاره گیاهان به روش خیساندن استخراج شد و تاثیر آنها بر روی رشد استافیلوکوکوس اورئوس در محیط کشت نوترینت آگار مورد بررسی قرار گرفت. جهت بررسی تاثیرات این عصاره ها در بدن موجود زنده، مدلهای موشی عفونت زخم استافیلوکوکوس اورئوس ایجاد شده و تاثیر تیمار این زخمها با عصاره گیاهان ارزیابی گردید. برای آنالیز داده های کیفی، از روش مشاهده استفاده شد. با توجه به آنالیز داده ها مقدار MIC برای عصاره گیاهان جنسینگ، زنجبیل، گل بنفشه و سرخارگل، به ترتیب برابر 0/17، 0/20، 0/32 و 0/72 میکروگرم بر میلی لیتر و شاخص MLC نیز برای این عصاره ها به ترتیب برابر 0/34، 0/40، 0/64، و 1/44 میکروگرم بر میلی لیتر بود. با توجه به نتایج بدست آمده از این مطالعه می توان نتیجه گرفت که که عصاره گیاهان جنسینگ، زنجبیل ، گل بنفشه و سرخارگل در غلظت های متفاوت دارای اثرات ضد باکتری خوبی علیه باکتری استافیلوکوکوس اورئوس هستند. اما در نهایت با تجمیع داده های می توان اینگونه نتیجه گرفت که گیاه جنسینگ و زنجبیل نسبت به سایر موارد دارای تاثیر ضد باکتری بیشتری بودندو سرخارگل گل کمترین تاثیر را داشت. مطالعه حاضر جزء معدود مطالعاتی است که تاثیر گیاهان جنسینگ، سرخارگل، گل بنفشه و زنجبیل را بر روی عفونت باکتری استافیلوکوکوس اورئوس مورد بررسی قرار داد.

کلمات کلیدی: جنسینگ، سرخارگل، گل بنفشه، زنجبیل، باکتری استافیلوکوکوس اورئوس ، مدل حیوانی

بررسی اثر عصاره گیاهان جینسینگ، سرخارگل، گل بنفشه و زنجبیل بر روی قارچ آسپرژیلوس فلاووس در شرایط آزمایشگاهی و مدل حیوانی

سیما صحرایی - مجتبی محمدی رکن آبادی - رسول شکری

چکیده

قارچها گروهی از میکروارگانیسمها هستند که به وفور در طبیعت پراکنده می باشند، و به دو گروه بزرگ مخمرها و کپک ها تقسیم می شوند. این گروه از میکروارگانیسمها به سادگی قادرند از طریق جریان هوا به نقاط مختلف منتقل و موجب آلودگی مکانها و موادغذایی مختلف در مراحل مختلف تولید و تهیه آنها شوند. در این مطالعه تاثیر عصاره گیاهان جنسینگ، سرخارگل، گل بنفشه و زنجبیل بر روی قارچ آسپرژیلوس فلاووس در شرایط آزمایشگاهی و مدل حیوانی مورد بررسی قرار دادیم. در این مطالعه تجربی، عصاره گیاهان به روش خیساندن استخراج شد و تاثیر آنها بر روی رشد قارچ آسپرژیلوس فلاووس در محیط کشت مولر هینتون آگار و نوترینت آگار مورد بررسی قرار گرفت. جهت بررسی تاثیرات این عصاره ها در بدن موجود زنده، جهت ایجاد عفونت کاندیدیایی، ابتدا باید سیستم ایمنی موشها تضعیف می شد. برای این منظور ما از تزریق داخل صفاقی داروی سیکلوفسفامید استفاده کردیم. برای آنالیز داده های کیفی، از روش مشاهده استفاده شد. با توجه به آنالیز داده ها مقادیر MIC برای عصاره گیاهان زنجبیل، جنسینگ، گل بنفشه و سرخارگل و به ترتیب 0/16، 0/18، 0/43 و 0/96 میکروگرم بر میلی لیتر و شاخص MLC نیز برای این عصاره ها به ترتیب 0/33، 0/36، 0/86 و 1/92 میگروگرم بر میلی لیتر بود. با توجه به نتایج بدست آمده از این مطالعه می توان نتیجه گرفت که که عصاره گیاهان جنسینگ، زنجبیل ، گل بنفشه و سرخارگل در غلظت های متفاوت دارای اثرات ضد باکتری خوبی علیه قارچ آسپرژیلوس فلاووس هستند. اما در نهایت با تجمیع داده های می توان اینگونه نتیجه گرفت که گیاه جنسینگ و زنجبیل نسبت به سایر موارد دارای تاثیر ضد قارچی بیشتری بودندو سرخارگل گل کمترین تاثیر را داشت. مطالعه حاضر جزء معدود مطالعاتی است که تاثیر گیاهان جنسینگ، سرخارگل، گل بنفشه و زنجبیل را بر روی عفونت قارچ آسپرژیلوس فلاووس مورد بررسی قرار داد.

کلمات کلیدی: جنسینگ، سرخارگل، گل بنفشه، زنجبیل، قارچ آسپرژیلوس فلاووس ، مدل حیوانی

بررسی اثرات پرولیفراتیو عصارهٔ هیدروالکلی گیاه پاغازه (Falcaria vulgaris) در رده‌های سلولی سرطانی روده و کبد

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چکیده

Falcaria vulgaris عضوی از خانواده Apiaceae است که در فارسی به "پاغازه" شناخته می‌شود. F. vulgaris به عنوان یک گیاه دارویی در جنوب غرب و غرب ایران برای درمان بیماری‌ها و در برخی مناطق به عنوان خوراکی استفاده می‌شود[1]. هدف این مطالعه بررسی اثرات عصاره هیدروالکلی این گیاه بر رده‌های سلولی سرطانی HT-29، HCT-116 و Hep G2 می‌باشد. بدین منظور عصاره هیدروالکلی برگ خشک‌شدهٔ گیاه پاغازه مطابق با مطالعات گذشته تهیه شد و در مرحلهٔ نهایی با دستگاه خشک‌کن انجمادی به شکل پودر آماده‌سازی شد[2]. در مرحلهٔ بعد سلول‌های مذکور به تعداد مناسب در پلیت 96 خانه کشت داده شدند و بعد از رسیدن به مرحلهٔ آزمایش با غلظت‌های 3.125 تا 800 میکروگرم در میلی‌لیتر به مدت 24 ساعت تحت درمان قرار گرفتند. پس از دورهٔ انکوباسیون تست MTT به منظور بررسی زنده‌مانی سلولی انجام گرفت. نتایج نشان داد که عصارهٔ هیدروالکلی پاغازه به شکل وابسته به غلظت توانایی افزایش زنده‌مانی در سلول‌های مورد مطالعه را دارد. بر اساس مطالعات پیشین، F. vulgaris حاوی ساپونین، تانن، کارواکرول و اسپاتولنول است که خاصیت آنتی اکسیدانی دارد و در درمان زخم معده و پوست، دیابت، عفونت ها و اختلالات کبد و کلیه موثر است[3]. در مشکلات دستگاه گوارش عصاره هیدرو الکلی این گیاه اثر محافظتی مؤثری در مقابل ضایعات معدی ناشی از اتانول و آسپرین نشان می‌دهد[4و5]. همچنین اثرات محافظتی پاغازه در برابر سمیت کبدی ناشی از CCL_4 در مطالعات قبلی نشان داده شده است [6]. عصاره آبی گیاه همچنین می‌تواند با کاهش تجمع چربی‌ها در کبد (استئاتوزیس)، باعث درمان بیماری کبد چرب از نظر پاتولوژی بافتی و فاکتورهای بیوشیمیایی شود [7]. با استناد به نتایج به دست آمده می‌توان از این گیاه به عنوان گزینهٔ حمایتی در موارد مربوط به ترمیم زخم، بهبود فعالیّت دستگاه گوارش و بهبود عملکرد کبد بهره برد که نیاز به مطالعات تکمیلی دارد.

کلیدواژگان: Falcaria vulgaris، کشت سلول، سمیّت سلولی، روده، کبد، MTT، پرولیفراسیون

بررسی خاصیت ضد قارچی عصاره گیاه رزماری بر روی قارچ آسپرژیلوس فلاوس و تاثیر این عصاره در بیان ژن AFL1 در قارچ آسپرژیلوس فلاوس با روشReal Time-PCR

مجتبی محمدی

چکیده:

سابقه و هدف: رزماری گیاه دارویی مهم است که خاصیت ضد میکروبی آن تاکنون بسیار کم مورد توجه قرار گرفته و تاثیر آن بر روی قارچ های بیماری زا و توکسین زا چندان بررسی نشده است. با توجه به محدود بودن داروهای ضد قارچی و مقاومت حاصل از آنها، به نظر می رسد که دست یابی به داروی موثر گیاهی ضد قارچی حائز اهمیت می باشد. ارزیابی خاصیت ضد قارچی عصاره گیاه رزماری بر روی قارچ آسپرژیلوس فلاووس و تاثیر این عصاره در بیانAFL1 در این قارچ با استفاده از روشReal Time.PCR هدف این مطالعه می باشد

مواد و روش ها: ابتدا قارچ های آسپرژیلوس فلاووس را روی محیط سابرودکستروز آگار و با تراکم نیم مکفارلند به صورت فشرده کشت داده و دیسک های استاندارد رزماری را روی سطح محیط کشت قرار دادیم تا با روش دیسک دیفیوژن، خاصیت ضد قارچی عصاره رزماری مشخص گردد و سپس به کمک روش ماکرودلوشن، ده لوله استاندارد و استریل و محیط مایع سابرودکستروز براث غلظت موثر عصاره را محاسبه کردیم و نهایتا به تاثیر این عصاره بر بیان.

ژن مولد آفلاتوکسین پرداختیم.

یافته ها: عصاره رزماری بر روی قارچ ساپروفیت رشته ای آسپرژیلوس فلاووس اثر بازدارندگی مطلوبی دارد به طوریکه متوسط قطر هاله های عدم رشد حدود 16الی 18 میلیمتر تعیین گردید، محاسبه MICموثر برای قارچ آسپرژیلوس فلاووس 3 الی 5 میلی گرم بر میلی لیتر محاسبه و تعیین گردید و نتایج حاصل از Real Time.PCRنیز مهار ژن تولید کننده آفلاتوکسین را در سطح مولکولی بخوبی به اثبات رسانید

نتیجه گیری: عصاره رزماری می تواند رشد قارچ ها را مختل نماید و بطور قابل توجهی تاثیر مهارکنندگی بر بیان ژن AFL 1و تولید آفلاتوکسین در قارچ آسپرژیلوس فلاووس داشته باشد.

واژگان کلیدی: آسپرژیلوس فلاووس، عصاره رزماری، AFL1, Real Time PCR

ضرورت کاربردهای گیاهان دارویی در معماری سبز بیونیک با رویکرد سلامتی جامعه

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چکیده

رابطه معماری و طبیعت در طول تاریخ دستخوش تغییرات مختلفی شده است؛ رویکردهای مختلفی بین این دو شکل گرفته است. در چند دهه اخیر در باب ارتباط معماری و طبیعت دو رویکرد مهم پایداری "زیست فناوری" در شهرها ساختمان بتواند زنده بودن خود را القاء کند شکل گرفته است. جدا شدن فضای سکونت یا کار انسان ها از زمین و استقرار در ارتفاع، مشکل کمبود زمین در شهرهای بزرگ را حل می کند؛ اما انسان را از طبیعت و زمین دور می کند. این دوری پایدار نیست و خیلی زود انسان برج نشین به جستجوی گم گشته خود می پردازد. سکنه شهرها با ساختمان های بلند، علی رغم داشتن آخرین امکانات امروزه، زندگی در یک خانه دارای حیاط و باغچه را آرزو می کنند، حتی اگر این خانه قدیمی و فرسوده باشد. این خواسته در خیال ساکنین خانه های واجد باغچه و حیاط، تا از آن جدا نشوند، به آرزو تبدیل نمی شود.در این مقاله تلاش بر این است تا به چگونگی استیلا و مهار نیروها و عناصر طبیعت و بوم آوری های آن و با رویکرد بیونیک طبیعت به ویژه گیاهان دارویی که ریشه در تاریخ تمدن ملی و مذهبی و فرهنگی ما ایرانیان دارد به عنوان منبع الهام قلمداد گردد و از قوانین انسان طبیعتی در معماری سبز بهره برده و با آوردن بخشی از طبیعت در محیط زندگی، بازگشت مجدد به بهره گیری مستقیم از آن در معماری و ساختمان سازی و فن آوری های مترتب بر آن پرداخته شود؛ روند طی شده کاوش گردیده و نمونه های بارز آن در سال های اخیر و در حوزه معماری وارداتی تحت عنوان معماری مدرن، معرفی و تحلیل می شود و نتیجه ای که از آن به دست می آید: کنار گذاشتن، تخریب و تغییر شکل دادن طبیعت و عناصر آن ممکن نیست. الهام گرفتن و الگوسازی از آن با استفاده از ترکیب معماری ،محیط زیست طبیعی و باز سازی فرهنگی ایده ها را پیوند داد.دیوارهای سبز،پشت بام های سبز توفیق و اقبال چندانی در معماری سبز در اذهان عمومی نداشته بلکه به عنوان معماری لوکس قلمداد می گردد.لذا احیاء پیوندهای فرهنگی در جامعه ایرانی-اسلامی با طراحی های شهری و معماری و شهرسازینیاز دیروز ،ضرورت امروز است.یکی از این راهبردها بهره گیری از پنجره های شیشه ای سبز با قابلیت کاشت و بهره برداری از گیاهان دارویی ، ترکیبی مناسب و تلاشی در جهت سلامت و اقتصاد جامعه با تکیه بر محیط زیست طبیعی با کاربرد فن آوری در معماری هدف است.

کلمات کلیدی: مدیریت یکپارچه شهری، بهره وری، تحول سازمانی، سازمان عمومی