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Keynote speaker

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Keynote speaker

Sustainable harvesting of cosmetic plants

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Abstract

Sustainable agriculture, which explains the existence of a balanced relationship between the environment and agriculture, has started to gain importance both in Turkey and in the world and necessitates the management of natural resources in a way that will be beneficial in the future. The concept of sustainability, which is also used in economic fields such as production, consumption, trade and growth, and in social, political, environmental and cultural fields, means the transfer of current resources to future generations without loss. In the agricultural sector, it is important to make sustainable practices in the process from the production of plants to reaching the consumer. Correct harvesting of plants is as important as cultivation in plant production. The principles of sustainable harvesting in plants should be regulated on the condition of providing high yield, high quality and the continuity of the plant's vitality **.** Especially the quality of the plants used in the cosmetic industry, the physical quality of the plant organ used as a drug (color, size, purity, cleanliness), the amount and variety of bioactive substances are important. The amount of active substance in the plant varies according to the plant organ harvested, the developmental stage of the plant and the harvest time. Therefore, the collector or grower should have knowledge about these issues. In collection management plans, it is important to determine the appropriate collection rules for each medicinal plant species and used parts of these plants such as roots, leaves, fruits, in order to set sustainable harvest levels. In the study, information have given about the sustainable harvest of plants that are used extensively in the field of cosmetics.

Keyword*:* Sustainability, Harvest time, Cosmetic Plants.

Keynote speaker

Study on Some Biochemical, physicochemical and Mineral contents of *Cichorium intybus* L. Growing in Van Lake Basin

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Abstract

Cichorium intybus L., which is a biennial plant belonging to the Asteraceae family, is consumed both as a vegetable and as a salad. It is a herbaceous plant that can grow in a wide geography such as Europe, the Middle East, Iran, North and South Africa, all of America, Australia and New Zealand.Cichory is a nutritious, rich and light food with a low amount of calories. The plants were collected from around the Castle of Vanat an altitude of 1650 m on 10.04.2019. The collected leaves of plant were washed with tap water then with distilled water, dried in a way that they would not be exposed to direct sunlight between the blotter**.**
In this study, physicochemical analysis values such as ash and dry matter content were determined as 13.8 and 92.6%, respectively. Biochemical parameters such as total antioxidant, phenolic and flavonoid content were obtained as 118.45 µmol TE/g dw, 170.48 mg GA/g dw and 8.72 mg QE/100g dw, respectively. In addition, Mg, K, Ca, Fe, Mn, Zn, Cu, Al, As, Cd, Co, Cr, Pb and Ni of cichory were reported as 4.62, 31.7, 16.5 g kg-1, 972.4, 63.8, 51.6, 14.6, 2246.9, 1.26, 0.03, 0.54, 3.68, 1.16 and 1.74 mg kg-1, respectively.

Keyword: Antioxidant, Cichorium intybus L., Fenolic, Flavonoid, Minerals

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Keynote speaker

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Cultivation techniques of origanum species in turkey and uses

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Abstract

Origanum genus is widely distributed in Turkey. Locally 32 taxa and species are found in Flora of Turkey, out of which 21 taxa are endemic to Turkey. Origanum onites, O. vulgare ssp. hirtum, O. vulgare ssp. vulgare, O. minutiflorum have high commercial importance. Along with these O. minutiflorum, O. onites and O. vulgare species are mostly collected from natural areas and marketed. All Origanum species are rich in carvacrol and thymol which increases their importance in the market and are utilized in pharmaceutical, cosmetics and alcoholic beverage industries besides their traditional usage (spice, condiment, folk medicine etc) in ethnomedicine and botanic usage. Increasing demand for oregano based products and their usage has given rise to development of their successful agronomic cultivation techniques by the researchers. This is giving rise to maintain uniformity and sustainability in the quality of oregano bye products obtained from the local oregano species along with provision of decrease in genetic erosion of the cultivated species.

Keyword: Marketing, Natural distribution, Agronomy, Multiplication endemic, Commercial, Flora of Turkey, Ethnomedicine

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Keynote speaker

Medicinal uses of Lathyrus species, its eating habits and cultivation techniques in Turkey

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Abstract

Grass pea is a multifaceted crop used in horticulture, landscaping, gardening, cover crop and as a forage plant. Turkey has 73 taxon of genus annual, biennial and perennial endemic and nonendemic Lathyrus taxon distributed all over country with concentration in Central Black Sea, South East and East Anatolian regions. Approximately 1/3rd taxon are endemic. β-ODAP is found in all lathyrus species that is the main causal agent causing paralysis in the lower limbs of poultry, cattle, and human beings. It is not widely consumed by people in Turkey; however, large scale usage by cattle is reported in the literature. These beta ODAP based chemical constituents in these are used as a blood clotting agent during operations in China. There is need to develop new cultivars of grass pea with <0.2% beta ODAP for their safe use. This could be achieved by hybridization, mutation breeding and using biotechnological tools.

Keyword: Grass pea, Lathyrus, Endemism, Threatened, Medicinal plant, Breeding

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Keynote speaker

Morphological and chemical diversity in Turkish basil (ocimum basilicum l.) Landraces

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Abstract

Basil (Ocimum basilicum L.) belonging to the family Lamiaceae is an aromatic plant. Because of morphological chemical characterization, the plant is used as ornamental and herbal tea, food, fresh and dried herbs, and spice. Turkish basil landraces were characterized according to morphological and chemical (essential oil and phenolic composition) composition. Sweet basil, lettuce leaf basil, purple-colored basil, lemon/anise basil, and brush basil were characterized as morphological groups. 12 different chemotypes were characterized according to essential oil composition in all basil samples, half of the samples (50%) contained linalool as major essential oil components. Methyl chavicol with high citral contents (methyl chavicol/citral) is a "new chemotype" in the Turkish basils. In Turkey, sweet basil is commonly cultivated for fresh herbs and dry spices. Purple basil is produced in the Malatya region. This basil is a local genotype for the region and has linalool/methyl cinnamate essential oil. In recent years, breeding studies have been continuing citral-rich chemotypes for the cosmetic industry. Rosmarinic acid, a phenolic component, was major component in all fresh and dried samples of basil leaves and amounts of the components in dried samples of basil leaves were higher than that of fresh samples of basil leaves.

Keyword: Basil, Ocimum basilicum, Diversity, Essential oil, Linalool, Rosmarinic acid

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Oral articles

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Processing of Cannabis Resin with high Cannabinol (THC) and Production of Medical cannabinoids Capsules and Salve (from seed to medicine)

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Abstract

After the isolation and charcterization of molecular structures of cannabinol (THC) and cannabidiol (CBD) as the main comonents of cannabis resin and also the discovery of Endocannabinoid System, organic cannabinoids of cannabis can recover any insufficiency of body's cannabinoids (endocannabinoid) to keep the body balanced and healthy. In addition, using natural cannabinoids as medicines is much safer than chemical drugs and opioids. Nowadays many countries' food and drug administrations have began permitting cannabinoids medicines to keep people healthier. Among those medicines we have natural cannabinoids in Epidiolex, natural cannabidiol in Sativex and chemical cannabinol in marinol. As we see medicine of natural cannabinol is missing, in FDA list, therefore the production of natural cannabinol medicines was chosen to work with. We made capsules dosing 100 and 200 mg and cannabinol ointment of 6000 mg in 100 ml.. This study showed that we have excellent environmental condition in our country to grow cannabis of any kind. Our yield was about 1050 grams dried flower with 33% of resin in which contained 29.60% of pure tetrahydrocannabinol. Cannabinol in our sample was approved characterized by GC-Mass analysis.

Keywords : Cannabinoids, Cannabinol, Cannabidiol, Endocannabinoids System, Marinol

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Evaluation of physicochemical and sensory properties of yogurt containing Lactobacillus plantarum freely microencapsulated with okra mucilage

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Abstract

In this study, *Lactobacillus plantarum* beads were produced by extrusion technique with sodium alginate and okra gum as microcoating layers. Also, three samples of yogurt contain free bacteria and bead and one sample was considered as a control. The results of yoghurt containing free bacteria showed that yogurt containing beads had a lower pH than other samples. Also, this yogurt contained more L *, a * and b * indices than other samples. Yogurt containing beads has more acidity and synersis than others. In terms of sensory evaluation, the addition of microcapsule increased taste, general acceptance bur decrease color, odor, texture in comparision to other samples. texture evaluation in the samples showed that the amount of hardness, gum ,chewingability, resilience and cohesiveness increased, but adhesion decreased during storage. *Lactobacillus plantarum* had a shelf life of 21 D during storage for 21 days at 4 ° C. According to the results, *Lactobacillus plantarum* with okra gum had a good shelf life in yogurt dairy product.

Keywords: Probiotic yogurt, okra gum, microencapsulation, physicochemical properties.
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Investigation of the impact of salinity stress on morpho- physiological characteristics of *Aloe vera*

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Abstract

Aloe vera is a valuable medicinal plant, whose value mainly refers to its leaf and gel. Salinity, as an abiotic stress, can negatively affect its morphological characteristics as well as quality and quantity of some phyto-chemical compounds of leaf and leaf gel including total phenol, total soluble sugars and its components including sucrose, glucose, and fructose. To investigate the impact of salinity stress on morphological and physiological traits of plant, different levels of NaCl including 0 (control), 50, 100, 150, 200 and 250 mM were applied in a complete randomized design with three replications under greenhouse conditions. The results indicated that the salinity stress has significant negative effect on morphological traits including plant weight, leaf length, leaf weight, gel weight, root length; and also biochemical traits such as total phenol, total soluble sucrose, glucose and fructose. The result of experiments indicated that salinity stress has significant negative effect on morphological traits which results in yield loss. Moreover, biochemical traits such as photosynthetic and defenses of plants were affect by stress. It was concluded that *Aloe vera* is a susceptible crop to salinity stress.

Keyword*:* Medicinal Plant; Morphological traits; Phenol compounds; Phyto-Chemical; Soluble sugars

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The relationship between yield and harvest time of *Rosa damascena* Mill

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Abstract

Rosa damascena Mill is a medicinal shrub from Rosaceae. Different parts of flower, especially its flowers, have value and application in pharmaceutical, food, health, cosmetic and aromatic (essential oil) industries.In this regard, this study was conducted to evaluate the harvest of *Rosa damascena* Mill flowers in different days and years of harvest. This research was conducted in a farm located in Torbat-e Heydarieh city during the years 1396, 1397, 1398 and 1399. *Rosa damascena* Mill fresh flower yield was recorded daily during the harvest process.Yield of *Rosa damascena* Mill flower in the first, second and third year after planting was 0, 66, 2246 and 3413 kg / ha, respectively. In the present study, flowering peakwas 9 in the second year, 12 in the third year and 8 days after the beginning of flowering in the fourth year. *Rosa damascena* Mill flower harvest on different days in three years of harvest followed the 3-parameter peak trend, so that the correlation coefficient (R) of harvest amount (kg / ha) and harvest day in the second, third and fourth year of harvest were 0.99, respectively. It was 0.96 and 0.91. According to the results of the present study, the economic performance of *Rosa damascena* Mill flower starts from the third year and lasts between 20 to 25 days after the beginning of flowering. By knowing the start times and peak flowering times of flowerbeds in each region, it is possible to reduce waste and costs and increase the harvest per unit area with the proper management of human resources.

Keywords: Dried flower bud, Flower yield, Peak flowering

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The role of contract farming in the production and exploitation of medicinal plants

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Abstract

Despite all the advances in chemical medicine and biotechnology, plants are still an essential resource for medicinal preparations, both preventive and curative. Hundreds of plant species are known for their medicinal value, and many of them are commonly used to treat and prevent certain diseases and ailments. In addition, due to the very high value of medicinal plants, if known and properly exploited, it is possible to prevent the outflow of large amounts of currency and help the flourish of the rural and national economy. The present review study has been compiled with the aim of investigating the role of contract farming in the production and exploitation of medicinal plants by library and documentary methods. This research has been carried out to investigate the production and exploitation of medicinal plants by contract farming. At the end, practical suggestions in this regard are presented.

Keywords: Types of medicinal plants, benefits of contract agriculture, sustainable development.

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Synergistic effects of wild fennel-gold nanoparticles against multidrug-resistant *Pseudomonas aeruginosa* for application in the food industry

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Abstract

Pseudomonas aeruginosa is a highly resistant gram-negative bacterium that causes many diseases, infections and, food spoilage. Therefore, research on new antibacterial agents with the biocompatibility and ability to eliminate pathogens and limit biofilm formation is essential. Nowadays, metallic nanoparticles (NPs) such as gold NPs (AuNPs) are recognized as novel antimicrobial agents due to their high surface area to volume ratio and unique physico-chemical properties. AuNPs are widely used in biological and biotechnological applications as biocidal agents. In the present study, green synthesized gold nanoparticles using wild fennel; Nigella arvensis leaf aqueous extract (F-AuNPs) as a potent medicinal plant with excellent properties were applied as a novel antibacterial agent against a multidrug-resistant (MDR) P. aeruginosa as a gram-negative strain. The results of this study showed good antibacterial effects of F-AuNPs with minimal inhibitory concentration (MIC) of 62. 5 µg/mL and the inhibition zone of 10 mm against MDR P. aeruginosa. These results introduced the F-AuNPs as a new antibacterial agent for application in various fields, particularly in the food industry.

Keyword: Antibacterial; AuNPs; Biosynthesis; Pseudomonas aeruginosa; Wild fennel

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Location allocation of Suitable Places for Rosa Damascena Cultivation in Isfahan Province using GIS assisted Analytic Hierarchy Process (AHP) and Fuzzy Logic

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Abstract

Agriculture is one of the most important economic parts in each country, which each product requires specific climatic and environmental conditions. So climatologists pay special attention to land use planning and managing ecological resources with appropriate methods. The aim of this study is to provide a framework for decision making techniques of Delphi, Delphi fuzzy and Analytic Hierarchy Process (AHP) using geographic information systems (GIS), to identify Suitable Places for Rosa Damascena Cultivation in the Isfahan Province, Iran. This study led to identification of 12 effective criteria in locating Suitable Places and also determining the allowable boundaries. The location criteria determined by the Delphi method, in which the roads, surface waters, land use, residential areas, protected areas, permeability of soil, aspect, slope, altitude, temperature, rain and humidity criteria were considered. Based on the results of AHP method, the respective criteria of surface waters, rain and temperature had the highest weights. According to the ArcGis results, 82.05% of the area has a total limitation (zero value) for the construction of Suitable Places for Rosa Damascena Cultivation, which is not usable. Proposed priorities have expanded in the western region of Isfahan Province. The highest priority Places has area of 422275 hectares and (3.96% of the total area), the second priority Places has an area of 964319 hectares (9.03% of the total area) and the third priority Places has an area of 528795 hectares (4.95% of the total area).

Keywords: location, Rosa Damascena, GIS, Fuzzy, AHP

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Investigation of Total flavonoid of 55 Iranian Berberis genotypes

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Abstract

The genus Berberis belongs to the Berberidaceae family, with 15 genera and 650 species around the world. It has valuable potential in the medicinal and food industries. In this study, the Total flavonoid of 55 fruits of the Iranian Berberis genotype were investigated. The results of this study could be used in the breeding and determination of superior genotypes in the future. Plant materials were collected from the barberry Collection Garden of Mashhad and also different natural habitats of barberry in various provinces of Iran. The samples were air-dried, finely grounded, and extracted by methanol at room temperature. Then, total flavonoid was measured by AlCl3 assays. The results showed a significant difference between flavonoid content of various extracts, at a probability level of 1%. The highest flavonoid content was observed with extracts of B. integerrima (genotype code 4-4) and B. orthobotrys × crataegina (genotype code 15-4) with an average of 6.3 mg quercetin equivalents (Q) ml-1 extract. The least was recorded for B. integerrima (genotype code 23-4) with an average of 0.4 mg quercetin equivalents (Q) ml-1 extract. The results showed that barberry has a great diversity in terms of phytochemical characteristics in different genotypes and is a valuable genetic source for breeding research.

Keyword: Total Flavonoid, AlCl3 assays, Berberis

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Sustainable Entrepreneurship in the Medicinal Plants Industry in the Light of the Business Model Canvas

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Abstract

Iran is known as a repository of medicinal and aromatic plants in the world due to its amazing diversity of plant species. Knowing the fields and using the huge capacity of medicinal plants can give a valuable position to this industry inside and in the export sector and Iran's successful presence in world markets. On the other hand, the capacity and employment rate of this industry is very wide in the dimensions of production, processing, warehousing, packaging, distribution and sales, considering its global capacities. Unfortunately, the existing capacities have not been used properly. One of the reasons for this is the lack of proper planning in the field of medicinal plants at the macro level and also the lack of proper business management at different stages by entrepreneurs. Accordingly, in this study, while introducing some types of medicinal plants, the business model canvas has been introduced in order to sustain the medicinal plants' industry. The business model canvas is one of the models that help entrepreneurs in business management in the field of medicinal plants at different stages, because it greatly affects the sustainability of businesses and the continuity of employee employment. A business model canvas is a tool for describing, analyzing, and designing a business model. This model consists of nine blocks that show how to provide a product or service by business owners of medicinal plants to customers or the target group. At the end of the article, suggestions for improving the activity in the field of medicinal plants are presented.

Keywords: Development Approaches, Sustainable Entrepreneurship, Medicinal Plants, Business Model Canvas.

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The medicinal properties of secondary metabolites; Cannabinoids (THC and CBD) in *Cannabis sativa*

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Abstract

Medicinal and industrial plant cannabis is native to Central Asia and has long been used by humans around the world as a source of food, fuel, fiber, medicine, and drugs for thousands of years. Cannabis has valuable agronomic properties, such as being easy to cultivate and diversifying bio-agriculture. From an agricultural point of view, hemp is a high-yielding crop and does not require much pesticide, herbicide, and fertilizer compared to other crops, and therefore will have a less negative impact on the environment. Cannabis seeds are rich in protein and oil and have long been used by humans. The hemp seed oil contains good amounts of unsaturated fatty acids, including linoleic acid and linolenic acid, which are good for human nutrition and health and reduce cholesterol and high blood pressure. Cannabis is also a good choice for two important biofuels, biodiesel and bioethanol. Hemp is very complex in terms of phytochemicals and more than 480 different chemical compounds have been identified in hemp. Some of these compounds belong to primary metabolites such as amino acids, fatty acids, and steroids, while compounds such as cannabinoids, flavonoids, acetylbenoids, terpenoids, lignans (phenolic amides and lignan amides), and alkaloids produced by alkaloids Valuable plants are cannabis. Therefore, cannabis is a very strong plant in terms of phytochemical compounds that has a high value in the pharmaceutical industry. Today, in various studies on the effect of cannabis on various diseases, the positive effect of cannabis plant compounds on some diseases Including cancer, MS, and AIDS has been reported to increase the value of this plant even more.

Keywords: Epilepsy, Phytochemicals, THC, CBD

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Access to Livelihood Assets: The Mechanism Needed to Strengthen and Sustain the System of Rangeland Medicinal Plants Exploitation

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Abstract

Although, rural communities perceived climate variability as consequent phenomenon during its repeatedly occurrence, but, complication of contextual factors and integration of climate variability negative consequences, changing this phenomenon as one of the most villagers' concerns in arid and semi-arid areas. Exploiting of medicinal plants on rangelands is a climatic-sensitive rural livelihood strategy in Iran. In order to provide the conditions required for the effective adaptation and sustainability of the medicinal plants exploitation system under climate variability, this study investigates the exploiters access to the livelihood assets. Research findings using survey of 200 exploiters families, whom selected using a systematic sampling technique, revealed their inadequate adaptive capacity (livelihood assets) with relatively large differences among individuals. Based on the findings, the small group of medicinal plants exploiters has the high level of accessibility to the livelihood assets. Based on the results, some recommendations have presented to strengthen their livelihood assets.

Keywords: Livelihood Assets, Sustainability, Medicinal plants exploitation system

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Conceptual design of saffron flower stigma separator

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Abstract

Iran has an annual production of 500 tons of dry saffron for food, medicine and industrial uses, Iran has the first place in saffron production in the world. In order to upgrade this position, the challenges facing saffron work must be solved, and the most important problem in this regard is the separation of saffron stigmas. In this study, to solve this problem, a saffron flower stigma separator was designed. The design method used twin diamonds, which is one of the most popular design methods. This method consists of 4 steps and two diamonds of problem and solution, in the first diamond, the problem is discovered and then defined. The result of the first diamond convergence is that a machine for separating the saffron flower stigma must include at least feeding, cutting point detection, cutting and separation units. In the second diamond, different solutions are proposed, then best of them are delivered as a solution. Therefore, in the second diamond using the brainstorming technique, all the proposed solutions were collected without any restrictions. Then, using morphological analysis technique, all concepts were reviewed and rated. The best method is selected for the design of the stigma separator, which uses the method of single feeding, cutting point detection by a special seat with laser cutting and separation in the cyclone with two pipes inside each other.According to studies, the idea of laser cutting in this research is presented for the first time in the world, it will lead to a fundamental change in saffron processing and related technologies.

Keywords: conceptual design, brainstorming technique, morphological chart, laser cutting, saffron flower

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Reduction of safflower plant petal lesions during harvesting

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Abstract

Safflower is a plant compatible with arid and semi-arid regions that is cultivated to benefit from its seeds and petals. The machine designed and manufactured to harvest safflower petals includes a cutting blade, suction motor, hose, motor box and bag holder, electric motor and chassis. Selected treatments to find the best conditions for the least amount of petal drop, including the amount of air suction (in three levels 1, 2, and 3) 19 with air speed of 19 m / s and engine speed of 3500 rpm (low), respectively. The air was 25 meters per second and the engine speed was 4000 rpm (average), and the air speed was 36 meters per second and the engine speed was 4800 rpm (high) and hand-picked by the worker (control). The results showed that petal shedding at harvest was significant at 1% level. The use of the device caused the amount of shedding to be improved compared to manual harvesting in the first suction up to 79.1%, in the second suction up to 93.09% and in the third suction up to 94.93%. For the least amount of fall and due to the reduction of energy consumption, level 2 suction with air speed of 25 meters per second and engine speed of 4000 rpm is recommended. This machine can collect between 3 to 4 kg of safflower petals with 8 hours of work per day by one user.

Keywords: Harvest drop, petals, safflower

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Effect of Vermicompost and Nitrogen Fertilizers on Morphological Traits, Percentage and Essential Oil Yield of Melissa Officinalis

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Abstract

In order to study the effect of organic (vermicompost) and chemical (nitrogen) fertilizers on the quantitative and qualitative yield of *Melissa Officinalis*, a factorial experiment based on Randomized Complete Block Design (RCBD) was conducted with three replications in the research field of Golestan Research and Training Center of Agriculture and Natural Resources. Experimental factors included vermicompost in four levels (0, 2.5, 5 and 7.5 ton ha^{-1}) and urea fertilizer with 46% nitrogen in four levels (0, 50, 100 and 150 kg ha^{-1}). Results showed that vermicompost had a significant effect on morphological characteristics and percentage of essential oil of *Melissa Officinalis*. The highest plant height, number of branches, fresh weight, maximum dry weight and The highest percentage of essential oil was obtained in application of 7/5 ton/ha vermicompost. Also, there was a significant difference between different levels of urea fertilizer so that the percentage of essential oil was significantly increased when the fertilizer was applied. The highest amount of essential oil (0.49%) was obtained in simultaneous application of vermicompost (7.5 ton ha^{-1}) and nitrogen fertilizer (100 kg ha^{-1}) which was 38% higher than control. In general, the results showed that application of vermicompost with nitrogen increases shoot growth and dry matter production and ultimately increases the yield slightly and significantly improves the yield of *Melissa Officinalis* essential oil.

eywords: Essential oil, Lemon Balm, Biofertilizers, Vermicompost, Urea Fertilizer

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Mechanization of medicinal herbs production of *Mentha piperita, Artemisia dracunculus, Ocimum basilicum and Satureja hortensis L.* in Alborz Province

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Abstract

This research was implemented in 2015-2020 by questionnaires and face to face interview with farmers in Alborz province on the four medicinal herbs as Mentha piperita, Artemisia dracunculus L., Ocimum basilicum L. and Satureja hortensis L. The results showed that for all 4 products, the mechanization coefficient initially had an increasing trend. But then in 2019 & 2020, the mechanization coefficient for these products has decreased. This is because of the producers more tendencies to the production of these four medicinal plants and allocate more acreage but less allocation of agricultural machinery in these years. Mechanization capacity for these products has been increasing over these years, and since 2015, the rate of increase of this index has been enormous. However the most important part of the medicinal plants mechanization, is the harvesting and post-harvest mechanization that unfortunately not used yet, despite the wide need.

Keywords: Mechanization Indices, Mechanization Coefficient, Mechanization Capacity, Medicinal Herbs

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Mechanization of production of effective pharmaceutical substances in controlled environments

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Abstract

Medicinal plants are considered to be the most unique source of natural medicines for human and other living organisms. Biologically active compounds identified and isolated from plants are used in many industries today and their use is increasing. Restrictions on the exploitation of natural resources and cultivation of medicinal plants due to the existing conditions do not meet this need and the use of new methods to reduce the pressure on agricultural and natural areas is necessary. The use of cultures of cells, tissues, hairy roots and endophytic fungi in controlled environments and bioreactors has been able to address some of this concern. What is important is to optimize the conditions and equipment for mass production of these materials in these environments to maximize production. In this article, we try to study different angles of this process and discuss new methods to achieve maximum efficiency in these environments with two conventional approaches and metabolic engineering.

Keywords: Elicitors, bioreactors, bioactive compounds, secondary metabolites

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Evaluation of antioxidant properties of aqueous and alcoholic extracts extracted from *Linum Usitalissmum .L*and *salvia leriifolia* plants by pulsed electric field pretreatment

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Abstract

In recent decades, much attention has been paid to extracts and essential oils extracted from various plants as natural antioxidant sources, which is due to the positive effects against food oxidation reactions. In the present study, the purpose of the first stage was to compare the antioxidant activity of aqueous and alcoholic extracts extracted from two sources of *salvia leriifolia* and *Linum Usitalissmum .L* under the influence of pulsed electric field with zero intensities (without pretreatment), 3 and 6 kV / cm. Meters and the number of constant pulses was 30. The parameters of total phenolic compounds and antioxidant activity were investigated by DPPH and TEAC methods. The effect of plant source, pretreatment and solvent (aqueous and alcohol) in extract extraction on the amount of antioxidant activity of extracts was significant ($P < 0.05$).). With increasing the intensity of pretreatment and selection of alcoholic solvent, the amount of antioxidant activity of the extracts was significantly increased at 95% confidence level. The extract extracted from Norouzak with alcoholic solvent and pretreatment (with an intensity of 6 kV / cm and a constant pulse number of 30) was selected as an extract with desirable antioxidant properties.

Keywords: Antioxidant *Linum Usitalissmum .L, salvia leriifolia*, pulsed electric field, extract

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Comparison of Essential Oil Compounds of Narcissus variety of Shahla Extracted by Enfleurage Method

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Abstract

Narcissus is one of the most important ornamental and medicinal plants which its oil is being used in cosmetic, sanitary and perfume industries. This research was conducted to optimize the number and the time of holding the flower on solid fat in enfleurage method and also evaluation of the essential oil yield and the components of narcissus varieties of Shahla. The essential oil of narcissus was extracted in enfleurage method by using a wooden frame with glass plates, called chassis in randomize complete block with 5 treatments and 3replication and then the essential oil compounds were detected by GC-MS. The results showed that the maximum amount of the essential oil yield (0.17%) belongs to four times and its minimum amount (0.10%) belongs to one time. Approximately twelve different components were identified and of total percentage, 92.28% from one time, 94.91% from tow times, 94.48% from three times, 93.79% from four times and 91.18% from five times was gained. Benzyl acetate, Linalool, Benzyl alcohol, 2- Phenyl ethyl acetate and Indol were the most important essential oil compounds from all times of flower replacement and the best treatment according the essential oil yield is four times of putting flower on fat. The essential oil of narcissus had different components that more researches are recommended.

Keywords: Benzyl acetate, Chassis, Enfleurage, Essential oil, Narcissus.

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Design, Fabrication and Evaluation of a Portable Harvesting Machine for Rosa Damascene

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Abstract

Rosa damascene is one of the significant Rosa flower in all over the world and one of the famous plant in horticulture history. Rosa flowers will harvest from the first of Ordibehesht to the end of Khordad before rising sun and in the cool air of morning. In the current research, a portable machine for flower harvesting designed and developed. This machine contains a cutter, suction pipe, fuel motor, frame, backpack and a cyclone separator. All components of the machine including the motor and the cyclone separator are assembled on frame and transported by workers. Flower cut exactly under the receptacle by a reciprocating cutter and sucked to the flexible pipe by the fuel motor and after that transferred to a cyclone separator. Finally, flower is collected in a canvas bag installed at the end of cyclone. Evaluation of the machine was done using completely randomized design with three treatments and three replications in the flower plain of Lizangan from Darab. The treatments were the revolution of motor shaft in three levels of 900, 1200 and 1500 rpm. The parameters including fuel consumption and harvesting period time in every treatment were measured. The control treatment was considered traditional flower harvesting by hand. Based on the evaluation results, increasing the rpm of motor was caused to increase fuel consumption and decrease the net harvesting period time. Also, harvesting time at maximum revolution of motor was decreased in comparison with hand harvesting.

Keywords: Rosa damascene, Mechanization harvesting, Portable machine, Fuel consumption, Harvesting period

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Effects of rice and dodonaea biochar on the concentration of macronutrients and micronutrients in roots and shoots of Shirazi thyme grown in a calcareous soil

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Abstract

In order to investigate the impact of the application of biochares produced from rice and dodonaea plant residues on the absorption of macronutrient and micronutrient of Shirazi thyme grown in a calcareous soil, a experiment was conducted as a completely randomized design with three replications at the research greenhouse of the Faculty of Agriculture and Natural Resources of Darab, Shiraz University, Iran, during the growing season of 2021. In this research, the rice straw and dodonaea stem-and-leaf have grinded and after their drying, by using a furnace for 4 hours at 400 °C, rice and dodonaea biochars have prepared. Treatments consisted of control (soil), soil + rice biochar 2% and soil + dodonaea biochar 2%. Results indicated that the effect of different treatments on the concentration of micronutrients iron (Fe), manganese (Mn) and copper (Cu), except zinc (Zn) in the roots and also the concentration of macronutrients sodium (Na), potassium (K), calcium (Ca), and phosphorus (P) in the shoots were significant ($P < 0.01$). In rice biochar treatment, Cu concentration in the root increased by 39.44% compared to the control treatment. Application of dodonaea and rice biochars increased the concentration of Fe and Mn in root and P and K in shoot compared with the control (i.e., no biochar). The highest micronutrients and macronutrients concentrations were observed in dodonaea biochar treatment. According to the obtained results, the use of dodonaea and rice biochar as soil organic amendments increase nutrient availability and ultimately improves thyme plant growth in calcareous soils.

Keywords: Shirazi thyme, Rice biochar, Dodonaea biochar, Macronutrients, Micronutrients
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Application of Gas Sensors in Medicinal Plants and Spices Authenticity (A-review)

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Abstract

The electronic nose consists of gas sensors array to mimic the human smell sense. The most important application of electronic nose in food Industry is determining the aromatic properties and quality. The use of machine olfaction system is known as a relatively low-cost, rapid and accurate analytical tool. Due to authenticity importance in the growing Medicinal Aromatic Plants (MAPs) and spices market, application of electronic nose has a key role in the quality assessment of products. Because of the volatile organic compounds in MAPs, it is possible to use sensitive gas sensors based on aromatic properties to detection and classification these products using multivariate data analysis methods. In this paper, a review of the application of gas sensors in the electronic nose system for quality assessment of MAPs is considered. The elements of the device and the methods of pattern recognition analysis are also introduced.

Keywords: Adulteration, Electronic nose, Medicinal Aromatic Plants, Metal-Oxide Semiconductor

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Lengthen the food shelf life through encapsulated plant-based antibacterials

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Abstract

One of the prominent causes of death and disability in the world is burns. Burns are defined as tissue damage caused by factors such as heat, chemicals, electricity, sunlight, or nuclear radiation. Burn wound recuperating may be a complex handle counting irritation, epithelialization, granulation, neovascularization, and wound withdrawal. Cutting edge treatments show a expansive number of choices, whereas conventional treatments are promising effective choices. Accelerating the healing process of burns has always been the focus of physicians. Because these wounds usually heal late. Therefore, proper treatment and care of these types of wounds to increase the speed of healing, as well as prevent their chronicity and infection has always been considered. In traditional Iranian medicine, due to the diversity and vastness of the country's vegetation, the use of medicinal plants to improve and treat severe burn lesions with various causes has been common. Various studies have shown the properties of some medicinal plants in healing burn wounds. Plant-based items have been utilized within the treatment of wounds for centuries worldwide. Recently, the components behind many of these conventional treatments may well be clarified in detail. The foremost commonly found components behind the home-grown source items supporting wound mending are for the most part their antioxidant, anti-inflammatory, antimicrobial, cell proliferative, and angiogenic impacts. In this review study, it was found that most of the mentioned plants have beneficial effects on the wound healing process and it seems that the compounds in these plants can be used in the wound healing process.

Keywords: Medicinal Plants, Healing, Wound, Skin, Burning.

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Sterilization of cumin seeds using infrared technology

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Abstract

Contamination of medicinal and spice plants at different stages of the production proc reduce the quality and lower added value of product. Therefore, sterilization of medicinal and spice plants is necessary to reduce microbial load**.** The aim of this study was to investigate the effect of infrared treatment (2.5, 4 and 5.5 min-heat flux=11.81 W/m^2) on microbial load, total color difference, essential oil amount and analysis of essential oil compounds. Treatment of 5.5 min reduced the total microbial count by 2.93 CFU / g. Also, mold and yeast and coliform in this treatment (5.5 min) decreased by 2.36 and 2.1 CFU / g, respectively. Color sample were changed ($p < 0.05$) by increasing processing time, that this can be due to the non-uniformity of the decontamination process. Also, significant difference was observed between essential oil amount in treatment of 4 min and control sample of cumin seed ($p < 0.05$). The most common components of essential oil of cumin seed were: Terpinen-7-al **<γ>** (38.963%), Cumin aldehyde (19.164%), γ-Terpinene (19.2%) and β-Pinene (14.06), respectively.

Keywords: Infrared, Sterilization, Medicinal and spice plants, Thermal processing

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Evaluation of essential oil and extracts from the aerial parts of cultivated Gotu kola in Gilan province

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Abstract

In this study, the aerial parts of cultivated Gotu kola plant in Gilan region was investigated to evaluate the efficiency of essential oil and identify its components. Essential oil was obtained by hydrodistillation and analyzed by gas chromatography–mass spectrometry (GC-MS). Essential oil yield was 0.04% (v/w). The forty-two volatile compounds were identified from essential oil of Gotu kola (94.54%). The oil contained 72.64% of sesquiterpenes, comprised mainly of Germacrene D (32.68%), E-Caryophyllene (11.41%), Neophytadiene (6.71%) and Isospathulenol (4.38%). Also in this research, the anti-radical capacity, total phenols and flavonoids of ethanolic and aqueous ethanol (75%) extracts Gotu kola were evaluated. Anti-radical activity of plant samples was measured by 2,2-diphenyl-1-picryl hydrazyl (DPPH) method. The phenol and flavonoid content of the extracts were determined by conventional methods. A standard control was used to evaluate each of these tests and each assay was performed with three replications. The results showed that the ethanolic extract of Gotu kola plant contains high amounts of phenols and flavonoids. In the DPPH test, the ethanolic extract of Gotu kola showed the best radical scavenging activity (IC_{50} =135.33 ± 4.51 µg/mL), about 48% of the potency of BHA as positive control (IC_{50} = 64.95 ± 0.67 µg/mL). With further antioxidative studies and tests, this species can be used as an additive or supplement to provide natural antioxidants to the body.

Keywords: Gotu kola, essential oil composition, total phenols, flavonoids, radical capacity.

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Evaluation of the effects of some species of medicinal plants on broilers

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Abstract

Nowadays, the application of medicinal plants in the human health and animal production is increasing, due to the great existent concern at world level for the crossed possible resistance to the antibiotics for many microorganisms as a response to indiscriminate subtherapeutic use in broilers. Poultry production is undergoing a continuous challenge to develop management strategies to optimize chickens' efficiency while limiting food safety concerns. Tradition-ally, antimicrobials have been widely used for improving health and growth performance in poultry; however, the increased public awareness about the risk of developing cross-resistance of pathogens to antibiotics has resulted in the gradual removal of antibiotics for therapeutic and prophylactic uses in food animals. feed additives originating from plants, and consisting of herbs, spices, fruit, and other plant parts, include many different bioactive ingredients. genus Withania (Family: Solanaceae) is a highly acclaimed genus of medicinal plants. Between the species of Withania, two (Withania somnifera (WS) and Withania coagulans(WC)) are significant. In this review aimed to sum up the present trends in the use of WS and WC as a feed additives in poultry with a special focus on their interaction with production performance, in vivo oxidative status and immune system.

Keyword: Feed additive, Broiler, Medicinal plants, Withania

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Investigation of drying kinetics of lavender using microwave dryer

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Abstract

Drying is one of the oldest known human methods for preserving medicinal plants and food, and because it reduces the water activity of crops, reduces the microbiological activity of crops and causes the least physical and chemical changes during the storage process. , Is one of the most common methods that can be used to improve the storage of food, including fruits. Microwave drying of food products can be a good alternative to hot air dryers. The microwave drying process is a relatively inexpensive method that has attracted the attention of many researchers today. Unlike conventional heating systems, microwave waves penetrate the material and the heat spreads throughout the material. Is. In this method, four power levels (300, 500, 700 and 900 watts) were used for drying. The minimum value of thermal penetration coefficient is 6.94 $\times 10^{-7} m^2$ / s and the maximum value is 4.89 $\times 10^{-6} m^2$ / s at 300 and 900 watts, respectively.

Keywords: Lavender, dryer, effective penetration, microwave

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Investigation of drying kinetics of lavender using microwave dryer

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Abstract

The problems of using solar energy in drying various agricultural products have caused industrial dryers to replace traditional drying methods. In this study, the amount of energy consumed, specific energy and activation energy of lavender drying was investigated using a microwave dryer. The experiments were performed at 4 levels of microwave power (300, 500, 700 and 900 watts). Graphs of experimental results were drawn. The changes in specific energy requirements were similar to those used in energy consumption.

Keywords: Lavender, Energy consumption, Specific energy, Activation energy

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Investigation and assessment of the business network of sale centers of medicinal plants and perfumeries in the Alborz provinceCase Study: County of Karaj

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Abstract

In the competitive market of the global economy, the importance of networks is evident by facilitating access to knowledge, resources, and markets. Therefore, in order to design and produce products and services, the development of new processes, reducing the time required to innovate or enter the market, exchange information and other networking resources. Accordingly, networking is of special importance in the medicinal plants business. The present study was conducted to identify the business network of sellers of medicinal plants and perfumes in Karaj city. The statistical population was the sellers of medicinal plants and perfumes in Alborz province. The results showed the prioritization of network benefits; increasing the income and wealth production capacity of network members, increasing technical knowledge and skills and techniques of selling perfumes and sellers of medicinal plants, improving the performance of the country's medicinal plants market are the most important benefits of the network of sellers of medicinal plants and perfumes. The study of the network of sellers of medicinal plants and perfumes showed the criteria of information exchange, cooperation, coordination and communication; in the medicinal plants business network, the sellers of medicinal plants and perfumes have good relations with the major suppliers of unions and guilds, other sellers and perfumers, marketers, traditional medicine specialists. And have very little interaction with organizations related to the agricultural sector and the health network. The study of network indicators showed that the key actors of the studied network are: sellers of medicinal plants, unions and guilds, suppliers and processors of medicinal plants that have higher control and activism in the network. Also, the rate of two-way links was 40%, which indicates the average stability of the network.

Keywords: Networking, business, sellers of medicinal plants and perfumes, Alborz

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Purification of Trachyspermum ammi by using electrostatic electrode corona-rotating cylinder separator

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Abstract

Purification of agricultural products is one of the most important steps in post-harvest processes. Electrostatic separation is one of the new methods in product processing applications and has different types. In this study, an electrostatic separator of rotating corona-cylindrical electrode was used to evaluate the performance of the device in separating the impurities in the alum. Trachyspermum ammi is one of the types of medicinal plants of the Umbelliferae family, the impurities of which are the same in size and weight; Today, this plant has a special place in the pharmaceutical and food industries. This research was conducted in the form of completely randomized complete factorial blocks with 3 replications. The functional variables of the device, electrode voltage, rotational speed of rotating cylinder and electrode angle and dependent variables to obtain performance results, grain separation percentage and grain purity percentage were considered. Before using the sample in the separation of Trachyspermum ammi by the machine, it was necessary to pre-separate the sieve with mesh number 10. The operating efficiency of the device in the optimal isolation mode was obtained at the voltage level of 8 kV, rotational speed of 30 rpm and electrode angle of 30 degrees relative to the vertical line was 87.28%.

Keywords: Purification, Electrostatic Separator, Rotating Cylinder ,Trachyspermum ammi, Medicinal Plants.

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Technical Challenges of Cumin Harvest Mechanization

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Abstract

Cumin is an annual plant and one of the crops suitable for arid and semi-arid regions of Iran. Cumin has been considered by farmers in recent years due to low water requirements and short growing season. The area under cultivation of this crop in Iran is 27,000 hectares. In Khorasan province, in the 99-98 crop year, it amounts to 18500 hectares with a production of 8639 tons and an average yield of 467 kg per hectare. Harvesting of cumin due to the sensitivity of losses is done in two stages. When the bushes turn slightly yellow, they are harvested by hand, and then the crop is threshed by manual methods, or by using grain threshers. The operation of separating and cleaning the product is done using manual sieves and blowing the product. This method of harvesting causes a lot of time and labor, loss of part of the product due to incomplete crushing, reduces the quality of the product. Lack of mechanized harvesting, high production costs and the need for a large labor force are obstacles to the development of cultivation of this crop. In this paper, the challenges facing the development of cumin planting and harvesting mechanization were examined from a technical point of view. Existing capacities and potentials, including all activities performed in the field of mechanization of planting and harvesting cumin, have been technically evaluated.

Keywords: Cumin, mechanization, planting, plant harvesting, threshing

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Construction and evaluation of safflower petal harvesting machine

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Abstract

Safflower petals have economic added value due to their many properties and applications. They are used in the food industry as a natural food color, in the textile and carpet weaving industries for yarn dyeing, and in the dyeing industry for dye production. In many parts of Iran, this crop is harvested manually. In this research, in order to harvest the petals, an electric Knapsack machine was designed and built and evaluated in the safflower field. The design of the design was t-test and evaluated in three replications. The results showed that there was a significant difference between the experimental treatments in terms of the studied traits at the level of 5%. Comparison of means of Knapsack machine and manual treatments showed that harvest losses were 0.63 and 3.25 percent, respectively, purity percentages were 97.61 and 95.28 percent, respectively, field capacity was 2.45 and 1.39 grams per minute, respectively. the profit-to-cost ratio was 1.75 and 1.16, respectively, which for these traits, between the machine and manual method, the difference was significant at the level of 5%. Finally, in order to harvest safflower petals according to the results of technical and economic evaluation, the use of machine method is recommended.

Keywords: Safflower, petals, harvest

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Optimization of black seed oil extraction process using ultrasound and microwave techniques

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Abstract

Black seed and its oil as a medicinal oil are usually used as important herbal medicine resources. Traditional methods of extracting black seed oil usually have low performance. In this research, ultrasonic-microwave-assisted extraction technique was used to extract black seed oil as a powerful tool in accelerating and improving physical processes. The response surface methodology (RSM) was used to optimize the performance of the extraction system affected by several input variables such as ultrasonic power and duty cycle, solvent to solid ratio, etc. The optimal values for sonication duration, intensity and duty cycle are equal to 7.98 s, 99.96% and 99.99%, respectively, and for the solvent to solid ratio, the duration of microwave irradiation are equal to 14.99 and 4 min. the Eetraction efficiency in the optimal conditions was 56.70% by weight, which shows a significant increase in oil extraction compared to the efficiency of the conventional method (39.20%). Therefore, the use of ultrasound and microwave techniques can successfully increase the extraction efficiency of black seed oil.

Keywords: Ultrasound, Cavitation, Extraction, Black seed oil

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Feasibility study of using photovoltaic irrigation system in 2 hectares of Rosa Damasina garden

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Abstract

Iran is one of the largest producers in the world with more than 27,000 hectares of Rosa Damasina Garden. A part of the products is exported. Rosa Damasina is adapted to the climatic conditions of Iran (arid and semi-arid). Iran's water resources are limited. The efficiency of limited water resources can be increased by developing the cultivation and processing of this medicinal plant. Application of photovoltaic systems in water pumping and irrigation of Rosa Damasina gardens can increase water efficiency, developing the consumption of renewable energy sources and reduce environmental impacts (The three great challenges of water, energy and the environment). Economic and technical assessments should be made before using photovoltaic systems because they are expensive. In this study, a photovoltaic system was designed as a power source for water pumping and irrigation systems in 2 hectares of Rosa Damasina Garden. The annual costs of this system were calculated for a period of twenty years. Then the costs of this system were compared with two alternative systems (using diesel engine and electrical pump). The results showed that as the life of these systems increases, the annual cost of the photovoltaic system decreases compared to the other two systems. The annual costs of diesel engine will be more than the annual costs of the photovoltaic system after 13 years. The annual cost of the photovoltaic system will be less than the electrical motor system after 20 years. In other words, the application of this photovoltaic electric system will be cost-effective compared to an electric motor for a long time (more than 20 years).

Keywords: Rosa Damasina Garden, photovoltaic Irrigation, Renewable Energy Sources
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Small greenhouse suitable for hydroponic cultivation of vegetables and medicinal plants

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Abstract

More than two-thirds of medicinal plants are traditionally collected from the wild. One of the problems of traditional collection of medicinal plants from the wild is reduction of their concentrate. Growing medicinal plants in suitable conditions and stress free makes the quantity and quality of them appropriate. Producing medicinal plants in small greenhouses (suitable for use in homes, offices and laboratories) can be economical and health friendly.
In this study, a small portable hydroponic (Nutrient Film Technique Type) greenhouse was built. Environmental control system (including temperature, humidity, radiation and nutrients) was designed and built. French lettuce seedlings were planted in the greenhouse. At the end of the growing season (40 days) lettuce was harvested and weighed. The average weight of each plant was 521.2 g. The average weight of plants in different floors of the greenhouse was not significantly different. The greenhouse systems operated as well during the test.

Keywords: Small greenhouse, apartment greenhouse, hydroponic cultivation, medicinal plants

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Microencapsulation of nepta extract by spray drying and evaluation of its stability in model and food system (Doogh)

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Abstract

In this study, the effect of wall composition (maltodextrin with dextrose equivalent of 7 and 20 and Arabic gum) and spray drying method on physicochemical properties of the microcapsules and stability of phenolic compounds during 35 days of storage in relative humidity (52.89 and 75%) and different temperatures (4 and 25 ^{o}C) were evaluated. The results showed that microcapsules prepared with maltodextrin-containing walls with dextrose equivalent of 7 (16.67%), Arabic gum (16.67%) and maltodextrin 20 (66.77%) had better physicochemical properties than others. Then, the effect of free extract (with concentrations of 1 and 3%) and microcapsules with optimal wall composition (with concentrations of 1 and 3%) in comparison with the addition of synthetic preservative of potassium sorbate (0.1%) and control sample (without any additive) was evaluated on the sensory properties (flavor, odor and general acceptance), the amount of total phenolic and microbial compounds (total number of mold and yeast) in the doogh. The results showed that the encapsulated extract was able to control the growth of mold and yeast by maintaining the sensory and phenolic properties in doogh and the lowest growth and mold after 28 days of storage at refrigerator temperature was observed in the sample containing 3% of the optimal encapsulated extract that was approximately equivalent with the effect of chemical preservative potassium sorbate.

Keywords: Phenolic Compound, Microencapsulation, *Nepeta binaludensis, Doogh.*
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Creation and development of clusters of medicinal plants, a desirable mechanism for processing and job creation

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Abstract

Today, the cultivation and development of medicinal plants has an effective role in job creation and economic development of countries and Iran is one of the countries with high potential for the production of medicinal plants. But in order to develop the cultivation and processing of these products and to complete its value chain, working in a cluster is one of the requirements. Therefore, it is necessary to seriously pursue the issue of creating and developing clusters of medicinal plants. The purpose of this study is to create and develop clusters of medicinal plants, a favorable mechanism for processing and job creation, which has been done in a library and analytical manner. Agricultural clusters (medicinal plants) are the aggregation of producers, agricultural businesses and institutions that are engaged in the same agricultural sector or sub-sectors of related agricultural industries that have common challenges and opportunities and value networks for they create the desired product. Agricultural clusters are considered as a key approach to help advance the agricultural sector in many countries. Extension and development such clusters have many advantages. Although the activity of agricultural enterprises and businesses in the form of clusters has a long history in developed countries, but in Iran, as in other developing countries, despite the emphasis on various development programs, this The topic has not been properly supported and guided. The results of this research can be used by the Ministry of Jihad for Agriculture, the Organization of Industrial Towns Company and manufacturers and devices related to medicinal plants.

Keywords: Sustainable Employment, Agricultural Business Clusters, Medicinal Plants, Value Chain.

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Non-destructive techniques and systems for detection of saffron quality and adulteration

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Abstract

Saffron as one of the most valuable medicinal plants is exposed to more fraud due to the high price. Adulteration reduces the saffron quality and leads to create the unhealthy product. It is a challenge facing international markets especially when saffron is used as a medicine. Common methods for saffron quality assessment and distinguishing the adulterated saffron include chromatographic-based methods which are time-consuming, expensive, and destructive. In this paper, non-destructive techniques and systems for rapid detection of saffron quality and adulteration was introduced. Due to their capabilities and advantages, near-infrared spectroscopy, machine vision and electronic nose are suggested as the powerful non-destructive technologies for fast and low-cost assessment of saffron quality and detection of product adulteration. Moreover, these techniques are suitable for developing the smart portable systems. It was also noted that the combined use of these systems can provide more information about the various quality aspects of the saffron

Keyword: Electronic Nose, Hyperspectral Imaging, IR Spectroscopic Imaging, Machine Vision, NIR Spectroscopy

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Identifying and explaining the drivers of the development of technologies for the production and processing of medicinal plants

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Abstract

The development of technologies in the field of production and processing of medicinal plants as one of the examples of sustainable agricultural development approaches is largely dependent on the introduction and use of them by farmers and processing plants of medicinal plants. Production and processing of Iranian medicinal plants has been done. Methodologically, it was qualitative and quantitative and exploratory factor analysis was used to confirm the identified propellants. The statistical population of this study was experts and managers related to the production and processing of medicinal plants of the Ministry of Jihad Agriculture (N = 360), of which 189 people were selected by stratified random sampling for research. The validity of the research questionnaire was obtained by the panel of experts and its reliability was obtained by calculating the Cronbach's alpha value (α = 0.954). Factors promoting the development of technology in the production and processing of medicinal plants using factor analysis were divided into 5 categories: educational and promotional factors, characteristics of production and processing technologies, government policy, sociological characteristics and applied research. 59% explained the total variance and 41% of the factors were not identified in this study.

Keywords: Technology, Medicinal plants, Processing, Propellants

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Design and construction of a harvesting head of borage harvester

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Abstract

Persian borage is a perennial plant that has been used as a traditional medicinal plant since ancient times. Nowadays, due to the identification of medicinal properties and active ingredient of this plant, the tendency is widely increased to cultivate and use it in Iran and also export it to some Asian and European countries. One of the most important reasons for its lack of extensive cultivation is the lack of mechanized harvesting of borage. At present, harvesting of this plant is mainly done manually, which requires a lot of labor and it takes a long time with high costs for harvesting. Reducing costs as well as reducing harvesting time requires mechanized harvesting of this plant. Currently, there is no any device that meets this need. Therefore, the design and construction of the borage harvester is very important. The main parts of the device are: chassis, electric motor and harvesting head. The head of the system includes roller brushes, shafts, gears and combs. By transferring power from the motor to the rollers by the shafts and the gears, the two brushes rotate in opposite directions. By passing the borage plant between the two bristles, the flowers are separated from the stem without cutting. Finally, the combs separate the flowers that are stuck to the brushes.

Keywords: Borage, harvested head, medicinal plant.

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Evaluation of drying time and amount of essential oil extracted from Peppermint with air-impingement jet dryer

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Abstract

Peppermint is a very valuable plant that is cultivated all over the world for food, medicine, perfume and medicine. The leaf is the most important economic part of peppermint, almost all of its essential oil is contained in the secretory hairs on the leaf surface. Peppermint essential oil is one of the most famous and most widely used essential oils among medicinal and aromatic plants. Drying of medicinal plants is the most important post-harvest process. Temperature and drying time of peppermint affect the quantity and quality of its active ingredient (essential oil). The main purpose of this study was to compare the amount of essential oil extracted from dried peppermint with the air-impingement jet dryer and oven methods. For this purpose, the air-impingement jet dryer designed and built in college of Aburaihan, University of Tehran was used. Peppermint was dried at three temperature levels of 35, 45 and 55 °C, and two levels of air – jet speed of 14 and 19 m/s until the leaves of Peppermint plant were dried. Then the leaves were separated from the stem using a leaf-picking device. Also, the drying of the plant was done using an oven at the same temperature levels. Clevenger device was used for essential oil extraction. The results of essential oil extraction showed that the amount of essential oil decreases with increasing temperature in both dryers. The results also showed that in most of the same temperature conditions, the amount of essential oil in the dried product by jet method was higher than the dried product with the oven. The amount of essential oil measured in this study for fresh and dried samples was measured 2.85% and 2.76% by weight relative to the dry weight of the material, respectively. These values were higher than all dried samples (collision jet and that) but there was no significant difference compared to the dried sample at 35 °C with the air-impingement jet dryer with an air jet speed of 19 m/s.

Keywords: Peppermint, Air-impingement jet dryer, Essential oil, Leaf separating machine

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Drying of rosella flower petals using cabinet solar dryer in Khuzestan conditions

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Abstract

In order to use benefits of solar energy with high productivity, a cabinet solar dryer for drying rosella flower petals in Khuzestan conditions has been fabricated and evaluated and compared with traditional drying method. The measured and evaluated parameters were drying time required, the process changing humidity in drying time, color change, antioxidant and mathematical model. The results showed that the average time required for drying rosella flowers in the solar dryer was 6.8 hours, While in the traditional method it lasted 3 to 4 days. Comparison of different treatments showed that the use of solar dryer compared to the traditional method of drying in the sun, reduced the drying time of the product in different treatments by 3.5 to 5 times. Color comparison in dried rosella flowers treatments showed that the use of solar dryer made rosella flowers with a completely natural color. Also, drying in the sun caused the antioxidant content of rosella flowers, as one of the main medicinal properties of this product, to decrease by 14.8%. Based on the results, the model of Midilli was identified as the best model for determining the drying characteristics of rosella flowers in different trays of solar dryer by natural convection. Finally, according to the results, the use of solar dryer to dry rosella flowers instead of the traditional method and exposed to sunlight was recommended.

Keywords: antioxidant, humidity ratio, mathematical model, rosella flower, solar dryer

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Investigation of Ecological Needs, Cultivation, Domestication and Phytochemical Properties of *Thymus* Species - Phase 1

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Abstract

In Persian, Avishan (Thyme) is a group of plants that belong to the family Lamiaceae. This group includes three genera Thymus, Zataria and Ziziphora.Thymus genus has several species that are used in the pharmaceutical, food and cosmetic industries. In order to study the various topics of this medicinal plant, the first phase of the mega-project on *Thymus* (With topics of habitat, distribution, ecological needs, cytogenetics, phytochemistry, cultivation, domestication, dryland farming, pests and diseases, mycorrhiza, biofertilizers, soil fertility, intercropping system and antimicrobial effects) was defined at the Forest and Rangeland Research Institute. The first phase of the mega project was implemented in 2007 for five years which included more than 60 national and local research projects in the country. At the end of this stage, 16-volume documents on various research topics in Thyme were compiled. It can be used to introduce the cultivar as well as to improve the cropping pattern in different climatic conditions. In order to complete the research, the second phase of the mega project started in 2017 and will continue until 2023. In the second phase, in addition to *Thymus* species, *Zataria* and *Ziziphora* species are studied.

Keywords: Habitat, Distribution, Ecological needs, Cytogenetics, Phytochemistry, Cultivation, Domestication, Dryland farming, Pests and diseases, Mycorrhiza, Biofertilizers, Soil fertility, Intercropping system and Antimicrobial effects

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Identify components of the business network of sellers of medicinal plants and evaluate their knowledge and skills

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Abstract

The growing importance of medicinal plants in the prevention and treatment of various patients and the spread of public interest in them reveals the need to develop the market and meet the market demand for these products. One of the solutions to the mentioned challenges is to create and develop a network among related actors. In this regard, the knowledge of the network among them should be measured first and the components of this network should be identified. This research seeks to investigate the knowledge variables and identify the components of the network of sellers of medicinal plants and perfumes in Karaj city. The statistical population of the study was all sellers of medicinal plants and perfumes in Karaj city (N = 250). Using Cochran's formula, a sample of 130 people was obtained and finally 100 questionnaires were completed. Measuring tool was a researcher-made questionnaire. The results showed; There is a positive and significant correlation between network knowledge and awareness of benefits. Establish effective communication with other sellers of medicinal plants to exchange market information, continuous exchange of market information and prices among members and familiarity with markets and customer needs. The results of exploratory factor analysis of 7 factors: cooperation and participation, information, communication, network formation and development, network organization, evaluation and follow-up of activities, marketing and sales were identified as components of the network of sellers of medicinal plants and perfumes. In total, they explained 70.78% of the total variance.

Keywords: Knowledge and skills, business network, network components, exploratory factor analysis, Karaj county

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Extraction and identification essential oils of dorema aucheri boiss

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Abstract

The genus *Dorema* from Apiaceae family includes 12 species that are mainly distributed in central and southwest Asia. In Iran, this genus is represented by seven species, one of which is *Dorema aucheri* Boiss., therefore, the aim of the present study is to investigate chemical composition of its essential oil of *Dorema aucheri* Boiss. Species were collected from different parts of the country and essential oil was collected and extracted by water distillation (Clevenger design). The essential oil samples were then injected into gas chromatography (GC) and gas chromatography-mass spectrometry (GC / MS) devices, and the compounds were measured and identified. *Dorema aucheri* Boiss species was collected on early spring May 2018 from Fars Province. Essential oil were extrated by water-distillation for 3 h using a Clevenger-type apparatus. The essential oil content was 0.15% from flowers, 0.08% from leaves and 0.07% from branches. Main components from flower were : n-tridecanol (21.2%), Canellal (18.2%), and γ- himachalene (10%), and in leaf were : (2E)-hexenyl acetate (22.1%), n- heptadecane (11.4%) and Trans- carveol (11.3%) , and in arial parts were Dihydro – eudesmol (23.5%), Canellal (22.9%) and γ- himachalane (21.4%). Also another samples were collected from Illam province, from two locality, sample 1 on flower main components were α- terpinene 38.8%, α-phellandrene 30.3%, and Benzaldehyde 22.4%, and for second sample 2 , main components were α-phellandrene 36%, Benzaldehyde 12.3% and α- terpinene 12.2%, respectively.

Keyword: Dorema Aucheri Boiss, Essential oil, Water distillation

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Economic study of establishing distillation and essential oil extraction units in Alborz province

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Abstract

The development of medicinal plants in the world has increased the demand for them. Therefore, the development of businesses related to this field with an economic approach is essential. Cultivation of medicinal plants and production of its products can be considered as a national necessity and within the framework of a specific program and society, medicinal self-sufficiency, employment and development of the agricultural sector and can be effective as an important factor in currency appreciation for the country. Considering the role and importance of cultivating medicinal plants in order to promote and persuade farmers to cultivate them, it is necessary to study the cultivation of these plants economically. This study was conducted with the aim of economic study of establishing essential oil and rose water collection units in Alborz province. The statistical population was the producers of distillates and essential oils in Alborz province. The data collection tool was a field and document review. Cost-benefit analysis was the method used in this study. The results showed that, taking into account the discount rate and depreciation, the payback time will be 4 years and the payback rate will be 50%. Therefore, establishing a production unit for essential oils and herbal essences in Alborz province will be economical.

Keywords: Cost-benefit, Alborz province, distillates and essential oils, medicinal plants

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Power-ultrasound on Extraction of Ajowan seed (Trachyspermum ammi L.)

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Abstract

Medicinal herbs are one of the natural resources of every country and economically, commercially, and in the process of processing herbs and their products are among the most important industries in the world. Ajowan(Trachyspermum ammi L.) is one of the important medicinal plants that in this study was designed and performed by the response surface method (RSM) to extract from Ajowan seeds with the help of continuous and pulsed ultrasound. This research is based on three levels of ultrasonic power (200, 100 and 300 watts), three levels of temperature (50, 40 and 60°C), three levels of total ultrasound duration (20, 10 and 30 minutes), and three levels of pulsed sonication (2 , 0 and 4 seconds) was designed and then compared by Soxhlet method (temperature 85°C and time 240 minutes) as a control. In this study, yield, total soluble solids, ascorbic acid content, phenolic compounds content and percentage of free radical scavenging (DPPH) of Ajowan seeds extract were compared by ultrasound and Soxhlet method. The results show that ultrasonic treatment with power of 300 watts(at 40°C) ,10 minutes sonication duration (continuous generation) as a superior treatment reduced the temperature by 2 times and the extraction duration by 24 times compared to the Soxhlet method.

Keywords: Ajowan, Extraction, Ultrasound,

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A new method of extracting of effective compounds from medicinal plants

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Abstract

In this study, using thyme medicinal plant without using heat by osmotic method, sugar solution with maximum active ingredients was produced. Effects of temperature (25, 35 and 45 degrees Celsius), sucrose osmotic solution concentration (40, 50 and 60%) and sampling time (15, 30, 60, 90, 120, 180, 240 and 360 minutes) on the amount The removal of active ingredients from the plant and the change in pH values and electrical conductivity (EC) were evaluated. The chromatographic results of the control samples and the sample containing thyme extract in sucrose solution showed the release of polar and non-polar active compounds in the osmotic solution. The release of different compounds showed a difference in their release rate during the osmosis process. Finally the results showed that the extraction of active ingredients of medicinal plants was possible by osmosis process, so that the pH and EC changed over time. The product of this research can be used in the production of beverage syrups and food. In this method, the damages of other methods of extraction of effective substances such as solvent extraction, use of heat in extraction and drying of medicinal plants such as distillation and essential oil extraction methods are minimized.

Keywords: Effective compounds, Extraction, Osmosis, Medicinal plant, Thyme**.**

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Effects of different salts, nanosilica and ultrasonic waves on percentage of germination, growth indices and total phenolics of buckwheat seedlings (*Fagopyrum esculentum* L.)

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Abstract

Buckwheat (*Fagopyrum esculentum* L.) is an annual herbaceous plant and belongs to the genus Polygonaceae. Buckwheat seeds have little nutritional value, but seedling sprouts have high nutritional value. The purpose of this experiment is the combined effect of different salts and nanosilica particles and ultrasonic waves to increase total phenol and identify the best treatment to increase seedling growth. Therefore, a factorial experiment was conducted in a completely randomized design with three replications. Experimental factors included and first factor having (ultrasonic waves (4 hours)/control) and second factor (salt treatments $CaCl_2$, Nacl and Kno_3 at a concentration of 5 mM/l and nanosilica particles at a concentration of 5 mM) The results showed that $CaCl_2$ treatments with ultrasonic waves increased the total phenol and seedling weight compared to other treatments. Also the results showed that ultrasonic waves have a positive effect on percentage of germination.

Keywords: Priming, nanosilica particles, total phenol, buckwheat.

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Production of valuable secondary metabolites from medicinal plants using hairy roots

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Abstract

The use of medicinal plants in the last decade has seen a significant increase in global markets. In 2020, the global market value of medicinal plants amounted to $ 90 billion. It is estimated that by 2050 the value of medicinal plants will increase to $ 5 trillion. The global plant-based industries market covers a wide range of pharmaceuticals, fragrances and pigments. Production of hairy roots by Rhizobium rhizogenesis (Agrobacterium rhizogenesis) can be obtained from a wide range of plants and allows the production of very diverse molecules. Hairy roots are able to produce and secrete complex active glycoproteins from a wide range of organisms. These expression systems are ready for use by various industries such as pharmaceuticals, cosmetics and food sectors due to the development of fully controlled large-scale bioreactors. The technology could also potentially be implemented for rare, valuable, endangered or endemic species in an effort to conserve biodiversity. So far, successful achievements have been made in the production of hairy roots in a variety of medicinal plants such as Papaver, Dracocephalum kotschyi, valerian and Astragalus, the results of which are promising in mass production through bioreactors.

Keywords: Agrobacterium rhizogenes, Bioreactor, Medicinal plants, Hairy roots

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Introduction of Salvia leriifolia Benth., A new plant in climate change

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Abstract

Salvia leriifolia Benth. is one of the valuable and perennial medicinal plants of the mint family (Lamiaceae), which is endangered due to improper use. The seeds of this plant are medicinal, nutritional, and economic importance in the growing areas. Therefore, considering the various applications of this valuable species and its drought resistance and its presence in arid and semi-arid regions, research on appropriate methods of cultivation and domestication is important in their habitats. A decade review on agronomic characteristics showed that the average temperature required to start regrowth (base temperature) is about 7 ºC and the growing degree day(GDD) from regrowth stage to the full maturity stage is about 800 to 850 degrees of growth day and the length of plant growth period in Mashhad region is about 90 to 100 days. In field conditions, it needs soil with sandy loam texture. The plant has low expectations for soil nutrients but responds well to organic fertilizers, especially compost, vermicompost, and phosphate-soluble biofertilizers such as *Pseudomonas putida*. The most suitable planting date is from mid-March to late April. The germination, vegetative and reproductive growth stages is relatively sensitive to salinity. Perennial plants are very resistant to frost and can withstand temperatures down to -24 ºC without damage. The results of the development of plant cultivation in Kashmar and Golestan stations showd the favorable response of the percentage of emergence and establishment in low soil salinity. On the other hand, managing moisture storage through seed cultivation in pitting method caused a significant increase in the percentage of seed germination in the first year of cultivation.

Keywords: *Salvia leriifolia*, Climate change, Phenology, Domestication

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Poster articles

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A Review of Medicinal Plants Affecting Polycystic Ovary Syndrome from the Perspective of Traditional Medicine

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Abstract

Polycystic ovary syndrome (PCO), or ovarian laziness, is a common hormonal disorder in women of childbearing age. Women with polycystic ovary syndrome have large ovaries that contain large numbers of small, fluid-filled cysts called follicles. Polycystic ovary syndrome is one of the most common causes of infertility in women. In this article, the properties of five-finger medicinal plants, flaxseed, peony and licorice were collected and reviewed from traditional medicine reference books as well as from databases. In traditional medicine, there are herbal remedies for ovarian activation that can be used to improve, treat and prevent. These herbs help to ovulate, enhance sexual desire, reproductive health and strengthen the ovaries. Herbs in the treatment of researchers showed that the herbs of five fingers, flaxseed, peony and licorice were effective in the treatment of polycystic ovary syndrome and can help reduce the complications of this disease in women.

Keywords: Herbal Medicine, Ovarian Cyst, Traditional Medicine, Vitex Agnus-castus, Stachys lavandulifolia.

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A Review of the Therapeutic Effect of *Anthemis tinctoria* on Infertility from the Perspective of Traditional Medicine

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Abstract

Infertility is a problem that affects 15% of women and the most common female origin is ovulation disorders. *Anthemis tinctoria* is one of the medicinal plants for which various effects have been mentioned in traditional medicine. *Anthemis tinctoria*, with its warm nature, is a sexual stimulant and cures menstrual disorders, including irregular and painful menstruation, and also cures polycystic ovaries to a large extent. Eliminates uterine infections and prepares the genitals for a successful pregnancy. *Anthemis tinctoria* is used in traditional medicine in the treatment of many diseases and research has been done to identify herbal compounds and its healing properties. In this article, the medicinal properties of *Anthemis tinctoria* on infertility and ovarian fertility were collected and reviewed from traditional medicine reference books as well as from databases. Usable components of the medicinal plant are chamomile flowers, and twigs. *Anthemis tinctoria* is an annual, short and durable plant that has a fragrant scent and grows in meadows and sandy soils. The nature of its essential oil is warm and dry, its essential oil and oil extract have wide uses for therapeutic purposes. Using *Anthemis tinctoria* to increase fertility and eliminate issues such as hormonal imbalance, impotence, etc. can have a positive effect on fertility.

Keywords: Medicinal Plant, Fertility, Traditional Medicine, Essential Oil, *Anthemis tinctoria*

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A Review of the Effect of *Foeniculum vulgare* Treatment on Female Infertility from the Perspective of Traditional Medicine

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Abstract

Infertility has been one of the global health problems throughout human history and, of course, is one of the unsolved problems of the human race. The use of herbs as an aid to the treatment of many diseases, including infertility, has been around for a long time. This has become especially widespread and popular in recent years. Infertility treatment with medicinal plants such as fennel, in addition to traditional Iranian medicine, has also been confirmed by scientific clinical studies. The purpose of this review study was to evaluate the therapeutic effect of *Foeniculum vulgare* on infertility from the perspective of traditional medicine. In this article, the therapeutic effect of fennel was collected and reviewed from traditional medicine reference books as well as from databases. Fennel is one of the most popular plants in the management of various gynecological diseases. In traditional Iranian medicine, fennel is also known as Badian and Razianaj. The usable components of the medicinal plant are fennel seeds. The nature of its essential oil is hot and dry, its oil and extract have many uses for therapeutic purposes. Clinical studies introduce fennel as a valuable medicinal plant in the management of gynecological diseases.

Keywords: Herbal Therapy, Female infertility, Traditional Medicine, Essential Oil, *Foeniculum vulgare*.

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A study on the medicinal plants of Jam city

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Abstract

Medicinal plants are a group of plants that all parts of them have compounds with medicinal effectiveness. Medicinal plants have been of great importance in the development of various communities. Medicinal plants have a special value. The use of medicinal plants has a long history. Jam city has a milder climate than the surrounding area, which has provided a good ground for the growth of medicinal plants. This study is necessary to identify the species of medicinal plants in Jam city. This research tries to identify the prominent and prominent species of medicinal plants in Jam city in terms of review method and using written sources and face-to-face interviews. The method of data analysis in this research is descriptive-analytical of qualitative type, and is applied in terms of purpose and nature. In this study, a number of prominent species of medicinal plants were identified, including: Thyme (body infections), Hanzal (parasite), Sepistan (chest pain and cough), Mishkurk (stomach), Helpe (cold), Mutlach (cold, diarrhea)) Itching (treatment of chest pain), esophagus (treatment of purulent infections), nettle root (treatment of female infertility) and five fingers (female infections), which are used in the treatment of diseases.

Keywords: Jam city, medicinal plants, disease, thyme, treatment

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Study of bed types and drought stress effects on the biochemical characteristics of evening primrose (*Oenothera biennis* L.) seed

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Abstract

Oenothera biennis L. or evening primrose is an ornamental plant belonging to the Onagraceae family and native to North America. Almost all parts of this plant are edible and medically or cosmetically applicable. This includes the roots, leaves, blossoms, flower buds and seeds. Its seeds have phenolic compounds that have significant health effects such as controlling blood glucose in human body. In order to evaluate and comparing the effect of different planting beds containing different amounts of cocopeat, perlite, compost with cow manure or vermicompost and drought stress or irrigation in the soil beds, as some biochemical factors in primrose, fatty acids and phenol contents, a factorial experiment was conducted in a randomized complete block design with 9 treatments and 3 replications at the department of plant products research greenhouse in years 2017. Seeds were provided **f**rom the Department of Medicinal Herbs of the University of Jihad and planted in the prepared beds. Seedlings resulted from germination of seeds were transferred to different planting media. Biochemical characteristics were studied at the end of the plant growth period. The results were analyzed statistically. Means comparison showed that the biochemical characteristics in plants grown in soilless bed containing vermicompost (medium 7) are the best option. Phenol content is higher in seeds of cultivated plants in soil conditions and presence or absence of drought stress has not significant effect.

Keywords: Grow bed, Evening primroe, Vermicompost, Fatty acids, Drought tension

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The position of medicinal plants in greenhouse and vertical cultures

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Abstract

Medicinal plants are stores of active and valuable secondary metabolites that have been economically beneficial for pharmacy and medicine. However, it is challenging to start large-scale and commercial cultivation of these plants because most of the arable land is mainly used to produce strategically essential crops. Other uncultivable lands are often affected by various abiotic stresses, one of the most important of which is salinity, drought and heat. For decades, humans have cultivated plants in open fields and greenhouses, with the aim of utilizing their primary and secondary metabolites. However, conditions in open fields and greenhouse environments are affected by weather conditions. The purpose of this review is to investigate the position of medicinal plants in greenhouse and vertical cultures. Greenhouse hydroponic technology is currently applied to the commercial-scale production of fresh or minimally-processed herbs for the vegetables market. This well-known and commonly employed technology could be easily applied also to the production of biomass for the extraction of bioactive molecules. It is generally acknowledged that greenhouse hydroponic and vertical cultivation are profitable systems for medicinal plants production in terms of biomass yield and quality of the raw material, which is clean and easy to be harvested and processed

Keywords: Protected culture; Hydroponic system; led grow lights; Vertical farming; Secondary metabolites

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Strategies to improve the performance of the Union of Producers and Exporters of Medicinal Plants and Food Products of Iran

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Abstract

The variability in crude oil revenues, the country's population increase and, most importantly, the depletion of oil resources, have led policymakers and planners to think about developing non-oil exports and getting rid of the monopoly economy is inevitable; Therefore, in order to reduce the dependence of Iran's economy on crude oil exports, the use of non-oil goods such as cultivation and production of medicinal plants and their products, has highlighted the role of such products in the global economic cycle, especially exports. The Union of Producers and Exporters of Medicinal Plants and Food Products of Iran, as one of the existing platforms to help increase the export of medicinal plants in the country, has some strengths as well as many challenges. Therefore, the purpose of current study is to determine the strengths and weaknesses, opportunities and threats of the Union to provide practical strategies in order to improve the performance of this organization. Thus, a qualitative study using SWOT technique was accomplished to analyze the situation of the mentioned medicinal plants association. The required data were collected through library studies and electronic documents. Based on the intersection of four internal (strengths and weaknesses) and external (opportunities and threats) factors, the SWOT matrix including offensive, defensive, diversity and revision strategies was identified. Finally, some applicable strategies have been provided in order to improve the performance of the Union of Producers and Exporters of Medicinal Plants including creating new national and international markets by identifying customers and companies for purchasing products, focusing on improving product quality with specific packaging and brand, more supportive policies, eliminating the brokering and administrative bureaucracies, and preventing imports.

Keywords: SWOT Analysis, Export, Medicinal Plants, Marketing, Strategy.

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The role of *dracocephalum kotschyi* boiss leaf extract in the green synthesis of silver nanoparticles as a antibacterial agent for use in food processing

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Abstract

Recently, the increasing negative reactions of consumers to chemical compounds and the use of antibiotics in agriculture has led to pressure for the development of alternative compounds as antimicrobial agents. Plant-based antimicrobials can be a good alternative, but they have limitations and may be lost during food processing. Therefore, the formulation of these Plant-based antimicrobials in the form of nanoparticles can solve these problems. Green synthesized silver nanoparticles (AgNPs) using plant extracts are a highly active antimicrobial agent in the food industry. In the present study, green synthesized silver nanoparticles using Dracocephalum kotschyi Boiss leaf aqueous extract (AgNPs-Dk) were applied as a novel antibacterial agent against a foodborne pathogen, i.e. multidrug-resistant (MDR) Pseudomonas aeruginosa as a gram-negative model strain. According to the obtained results, the maximum zone of inhibition was 13 mm and the minimal inhibitory concentration (MIC) of biogenic AgNPs-Dk was 31.25 µg/mL against MDR P. aeruginosa. Therefore, the biogenic AgNPs-Dk can be used as a new antibacterial agent in various fields, particularly in the food industry, such as food packaging and processing to remove foodborne pathogenicity.

Keywords: Antibacterial agent; AgNPs; Biogenic; Food processing Pseudomonas aeruginosa

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Evaluation of short-term postharvest application of abiotic elicitors on photosynthetic pigments and water relation of basil

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Abstract

Short-term application of elicitors during postharvest handlings is a practical method for inducing physiological and biochemical changes in order to increase the postharvest quality of vegetables and fruits. Photosynthetic pigments are important physiological factors determining the nutritional quality of basil. In this study, effects of different abiotic elicitors were investigated on chlorophyll a and b, carotenoids and RWC of basil during postharvest. Basil seeds were planted in a greenhouse and treatments were applied on plant leaves after their harvest. Elicitors included darkness and different light intensities at 4 °C, UV-C irradiation, 35 °C and darkness and different light intensities at 24 °C in post-harvest conditions. The results showed that the highest amount of chlorophyll a, b and total chlorophyll was detected at light intensity of 500 µmol m^{-2} s^{-1} applied at 24 ° C with an average of 6.42, 2.41 and 8.83 mg/g of fresh weight, respectively. Application of all elicitors increased the amount of carotenoids compared to the control and the highest amount of carotenoids (3.31 mg/g of fresh weight) was detected in light intensity of 300 µmol m^{-2} s^{-1} at 4 ° C for 48 hours. The results of mean comparison of RWC showed that most of the elicitors reduced RWC compared to the control. A better understanding of the physiological responses of plants to elicitors during postharvest handling can help to improve the quantity and quality of basil during postharvest.

Keywords: Post-harvest, Basil, Chlorophyll, Carotenoids, RWC

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Effect of Ascorbic acid and Thiamine foliar application on Basil (*Ocimum basilicum* L.) quality and growth

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Abstract

Basil (*Ocimum basilicum* L.) is one of the most important leafy vegetables with high nutritional and medicinal value**.**In order to investigate the effect of ascorbic acid and thiamine foliar application on the quality and growth of basil, an experiment was conducted as a completely randomized statistical design with 7 treatments including ascorbic acid and thiamine at three levels of 50, 100 and 150 mg / l in 3 replications. The pot without foliar application was as a control. In this way, about four weeks after sowing the seeds, the plants were sprayed once every 10 days. Sampling and evaluation of traits were performed about 10 days after the last foliar application. The results showed that the highest fresh and dry weight of shoots and roots in thiamine treatment was 150 mg / l and the lowest in control treatment. The highest and lowest total chlorophyll content was obtained in thiamine treatments of 100 mg / l and control, respectively. The highest amount of total carbohydrates in thiamine treatment was 150 mg / l and the lowest in control treatment. The highest and lowest levels of ascorbic acid and thiamine were 150 mg / l and thiamine 150 mg / l in ascorbic acid treatments, respectively. The Maximum amount of essential oil was obtained in thiamine treatment 150 mg / l and the lowest in control treatment. In general, foliar application of ascorbic acid and thiamine improved the morphological and biochemical traits of basil.

Keywords: Ascorbic acid, Basil, Carbohydrate, Protein, Thiamine.
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A descriptive list of plants and their functional services in Lar Absar mountain range of Mazandaran

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Abstract

Identifying plant species in each region is the prelude to major planning to exploit the right services and functions of each ecosystem. the flora and applications of functional plant services in Lar Absar rangeland of Mazandaran were studied.. A total of 76 species belonging to 25 plant families were identified. The most populous plant families included Poaceae (13 species). Examination of plant species biosystems showed that hemicryptophytes and trophytes have the highest presence (0.73 in total). The highest number of hemicryptophytes with 8 species belongs to the Astraceae family, followed by the Poaceae and Fabaceae families with 7 and 5 species each, respectively. Most trophites are found in the families Poaceae and Lamiaceae. Geographical distribution of plant species shows that most plant species of Lar Absar rangeland are Turanian Iran (53%). After that, the predominant species belong to the European flora of Siberia and the Mediterranean. Other plant species are multinational and cosmopolitan. Another species is the Sandy Desert. The study of the attractiveness of plant species for beekeeping activity showed that a large percentage of plant species (57%) have moderate and good attractiveness. Also, about 77% of plant species are medicinal. The results showed that 37% of plant species are edible. In addition, 69% of all plant species in Lar Absar rangeland have grade I and II palatability and 31 species have grade III palatability. The results show that almost half of the plant species (48%) are attractive in terms of recreation. Therefore, this customary system can have various uses to increase rangeland income.

Keywords: Beekeeping, Delicacy, Medicinal plants, Recreation, Vegetation

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Lysimeters are effective tools in determining of water requirements and thresholds drought tolerance in medicinal species

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Abstract

Lysimeters are used as a suitable tools for water requriment and other studies related to water, soil and plant relationships under natural conditions and have a long history in this field. One of the important goals in designing and launching of Yazd lysimeter experiment was to perform tests related to water requirement and drought stress in woody species, including medicinal species. The results of determining the water requirement and studying the morphological, physiological and biochemical properties of jujube (*Ziziphus jujuba* Mill) as an important wood medicinal species, showed that lysimeters can be used as an effective and efficient tool in collecting and providing accurate information in water requirement, water relations and drought stress for used of other medicinal species. In this study, annual evapotranspiration on average three jujube ecotype was in control irrigation regimes, 30 and 60% under-irrigation deficit, respectively, 828.1, 514.1 and 0.386 mm and plant coefficients (Kc) were measured 0.45, 0.28 and 0.21, respectively. Although jujube trees can tolerate to mild stress, yield, fruit number, average fruit weight, fruit diameter and height, total phenol, anthocyanin, soluble sugars and fruit antioxidant activity in all three ecotype are affected by drought stress. The highest yield, fruit number, average fruit weight, fruit diameter and height, fruit soluble sugars and fruit antioxidant activity were related to the control treatment.

Keywords: Evapotranspiration, Drought stress, Jujube, Fruit, Antioxidant activity

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Effect of foliar application of spermidine, citric acid and proline on phenolic and flavonoid content of *Calendula officinalis* L. under drought stress

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Abstract

Drought stress is one of the most important abiotic stresses that reduces agricultural production and compounds such as polyamines, organic acids and amino acids play an important role in increasing plant resistance to environmental stresses. In order to study the effect of foliar application of spermidine, citric acid and proline (zero, 50 and 100 mg/l) on phenolic and flavonoid content and antioxidant activity of *Calendula officinalis* L. under drought stress (no stress (control), 25 50 and 75% of field capacity) a factorial experiment was conducted in a completely randomized design with 3 replications. Foliar application was performed in three stages with intervals of about 20 days, including six visible leaves, full tillering and emergence of the first bud, and sampling and evaluation of traits were performed about 10 days after the last foliar application. The results showed that all treatments had a significant effect on the measured variables. Increasing drought stress decreased the evaluated traits, while the highest phenol content in 75% field capacity treatment and 100 mg/l proline foliar application, the highest flavonoid and rutin content in 75% field capacity treatment and 100 mg/l spermidine foliar application treatment and the highest total antioxidant activity (DPPH) was obtained in the treatment of 75% of field capacity and 100 mg/l of citric acid. According to the obtained results, application of spermidine, citric acid and proline with a concentration of 100 mg/l with an irrigation level of 75% of field capacity improved the phenolic and flavonoid content of marigold.

Keywords: Antioxidants, Citric acid, Proline, Rutin, Spermidine.

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Effect of sowing date and plant density on yield and yield components of black cumin (*Nigella sativa* L.) in Gorgan, Golestan province

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Abstract

In order to investigate the effect of sowing date and plant density on yield and yield components of black cumin, an experiment was conducted in a split plot arrangement base on a randomized complete block design with three replications in the Research field of Golestan Research and Education Center of Agriculture and Natural Resources during growing season of 2020-2021. In this experiment, four sowing dates (5 October, 5 November, 5 December and 5 January) as the main factors and in second factor was plant density at four levels (40, 80, 120 and 160 plant.m^{-2}). The results showed that there was a significant different effect on yield and its components by delaying sowing date, so that the grain yield, number of capsules per plant, number of seeds per capsule and 1000-seed weight was decreased 62, 39, 30 and 21%, respectively. Also, the above traits had increasing trend with increasing density from 40 to 120 plant.m^{-2}, but further increase in density to 160 plant.m^{-2}, these traits was reduced except biological yield. The highest grain yield (1455 kg/ha) was obtained on the sowing date on November 5 and the density of 120 plant.m^{-2}, which were not significantly different from the density of 80 plant.m^{-2} due to the high compensatory power of black cumin. In general, in order to achieve the desired economic yield in black cumin in Gorgan region, it can be recommended sowing date in mid-November with density of 80 plant.m^{-2}.

Keywords: Biological yield, Black cumin, Delayed sowing, Grian yield, Plant density.
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The position of water resources management in virtual water trade of medicinal species

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Abstract

The human need for water and its scarcity, on the other hand, has created problems for various sectors, especially in agriculture .The high dependence of some agricultural products on water, reasons like inattention to water consumption and lack of proper cultivation patterns in the region, have multiplied the problems of this sector. Hence, researchers are always looking for appropriate use of water in agriculture. This research tries to study the concept of virtual water trade, which is based on allocating a certain amount of water to the product. The above method is one of the relatively new concepts in agriculture and production of medicinal plants, which is important considering the needs and amount of water consumed in this field. The purpose of this study is to determine the position of water resources management based on virtual water trade on medicinal plants in a descriptive, analytical and consistent manner with library documents and resources. Since in agricultural production, especially medicinal plants, the amount of water consumption and water footprint of each crop in the region varies under the influence of climate, agricultural operations and irrigation efficiency, library research has shown that the optimal use of water resources in agriculture and plant production Virtual water technique is necessary by reviewing the allocation and management of water resources. In fact, by developing efficient management methods that can be used to calculate the actual amount of water consumed by each product, the virtual water trading strategy can be offset by importing some products and thus save water consumption.

Keywords: Agricultural Products, Medicinal Plants, Virtual Water, Library Resources, Irrigation Efficiency

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Advantages and disadvantages of different mechanisms that can be used in manual-planters used for medicinal plants plantation in rangelands and small-scale farms

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Abstract

The growing growth of the medicinal plants industry in Iran and the world has increased the attention to the sustainable production of these products. One of the shortcomings of this industry in the country is the low level of mechanization of medicinal plants. Despite Iran's high potential in the production of medicinal plants, unfortunately, there are not many large-scale farms for these plants cultivation and they are mainly cultivated in small scale farms. Heavy machines utilization in small-scale farming is not economically reasonable. In addition, rainfed cultivation using tractor implements in some hard-to-reach and high slope areas, such as mountainous rangelands, is not possible. In these cases, a manual machine can be very useful. It is necessary that this machine would be portable, simple, user-friendly, and low-cost, and would be able to increase the speed and decrease the hardship of cultivation. Such a machine can be used to planting the medicinal plants in rangelands and small-scale and research-scale farms. In the current study, advantages and disadvantages of different methods have been examined and in some cases some suggestions have been made about these machines. This study can be the starting point for achieving a successful design of a manual planter.

Keywords: Manual Planter, Medicinal Plants Plantation, Mechanization, Rangeland Plantation

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Organic cultivation of Ashwagandha or Indian ginseng (*Withania somnifera*) in Iran

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Abstract

Ashwagandha (*Withania somnifera*), known commonly as Indian ginseng, Bozidan and winter cherry that grows native to India and North Africa. Ashwagandha as one of the prominent and native medicinal plants of India that uses for cultivation, development and exportation. This plant also as native and wild flower grows in some southern and southeastern regions of Iran, such as Sistan and Baluchestan province in its natural habitat and its root and leaf extract and root and leaf powder have medicinal properties for human health. In this study, an attempt has been made to use the potential of the local climatic conditions of this region for agricultural cultivation and job creation, and even other regions of Iran that have suitable climatic conditions for the cultivation of this plant. Remarkable and high price of Ashwagandha, can also be recommended as a medicinal plant with high economic value as an alternative to other crops or in mixed cultivation with other crops cultivated in these regions. In this project, in the year 2018 overcome barriers to seed germination of Ashwagandha was investigated in the laboratory of Royangiah Shastoon Sabz Knowledge-based Company. Then, for the first-time cultivation of Indian Ginseng was evaluated during 2020 growing season in the research farm of Higher Education Complex of Saravan, Saravan, Iran. Then it was developed in other regions such as the southern part of Kerman province in Anbarabad County in the form of contract farming in the year 2021. The most important cultivation factors of Ashwagandha were investigated, such as seed germination treatments, optimal planting date (OPD), low water farming methods, role of Biotic stresses such as pests, plant pathogens, weeds and also Abiotic stresses like heat and cold.

Keywords: Ashwagandha, Crop cultivation, Iran

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The application and commercialization of Ashwagandha, popularly known as Indian ginseng (*Withania somnifera*)

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Abstract

Ashwagandha (*Withania somnifera* (L.) Dunal), known commonly as Indian ginseng, Bozidan and winter cherry, is one of the most important medicinal herbs and known the King of medicinal herbs in the traditional system of medicine in India (Ayurveda). In recent years, the development of cultivation of this plant in the southern provinces of the country has begun. The most important known biologically active chemical constituents of this plant are Withanolides. Some of the known therapeutic effects of Ashwagandha root are antimicrobial, anti-cancer, anti-Alzheimer, relaxing, anti-depressant and anti-anxiety properties, concentration, increasing sexual potency in men and women and also increasing bone density and improve bone formation. Different types of consumption of this product are in the form of tablets, capsules, powders, syrups, drinks, shampoos, creams, etc. in the world. At the moment India is the largest producer of Ashwagandha in the world and Iran is the importer of different types of this product or consumption as a raw material in the pharmaceutical, medical and health-oriented industries. Cultivation of this plant and processing of its products in the pharmaceutical industry in addition to meeting the needs of the domestic consumer market, it can lead to a decrease in its price and decrease in the foreign currency outflow as well as the field of exports and entry of currency into the country. Promoting the importance of the health-oriented value of this medicinal plant, processing and packaging of this product can provide job creation in the southern and tropical provinces of the country. In this study, it has been tried to introduce the most important medicinal effects of Ashwagandha and its consumption forms and commercialization.

Keywords: Ashwagandha, therapeutic effects, commercialization.

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Evaluation of mycorrhizal symbiosis in establishment and dry aerial herb yield of *Achillea millefolium* L. in dryland condition

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Abstract

In order to investigate the effect of different arbuscular mycorrhizal fungi on the establishment, growth and yield of *Achillea millefolium* L in dryland cultivation, an experiment was conducted in 2017-2018. This research was conducted in a randomized complete block design with four treatments and three replications. The studied treatments included three species of arbuscular mycorrhizal fungi including 1- I = Rhizoglomus intraradices 2- M = *Funneliformis mosseae*, 3-F = Rhizoglomus fasciculatum and 4- control (no inoculation of plants). Seeds were treated and seedlings were produced in greenhouse conditions and then the seedlings were transferred to the Semnan natural resource research field at Shahmirzad with spacing of 50 cm between and 30 cm within the rows.. Evaluation of various traits was performed during the flowering stage of the plant. The results showed that the application of *R. fasciculatum* increased 75% of the establishment of yarrow plants in dryland conditions compared to control plants. The mentioned treatment significantly increased the fresh and dry weight of yarrow root compared to the control treatment. An increase in dry matter yield (aerial herb) of about 80% compared to control plants was observed as a result of this treatment. Based on the findings of this study, the use of *R. fasciculatum* is recommended to achieve high quality seedlings with the ability to establish in dryland conditions and produce the highest aerial herb yield.

Keywords: Yarrow, Arbuscular Mycorrhizal fungus, dry matter, drought stress.

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Comparison of yield components of Black Cumin (*Nigella sativa* L.) under spring and autumn cultivation conditions in farm of Kermanshah province

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Abstract

This study was conducted to compare the components of black seed yield under spring and autumn cultivation conditions in farms of Kermanshah province. The statistical population consisted of (each experimental unit consisted of 5 rows of black seed and two methods of spring and autumn cultivation in three different places (Dalahu, Kermanshah and Islamabad) in 3 replications. The statistical design of completely random blocks was used. Included number of inflorescences, root length, plant diameter, plant height, biological yield.Variance analysis results show that the effect of location, planting date and moisture conditions on the number of inflorescences, root length, plant height and biological yield of black seed was significantly different but the effect of location on plant diameter was not significant.The interaction of location under moisture conditions on all traits except plant diameter and biological yield was significant.The interaction of planting date under moisture conditions on all traits With the exception of plant diameter and root length, plant height was significant.The highest number of inflorescences, plant height, related to autumn and spring planting dates in Kermanshah and Islamabad regions, respectively, and the lowest related to spring planting dates in The results showed that in the first stage, the availability of available water has improved the black seed traits, on the other hand, cultivation in the season Autumn, in turn, had a great impact on improving plant growth. Among the three regions, Kermanshah was in the first priority of cultivation, followed by Islamabad and Dalahu, respectively, where it is better to cultivate in autumn.

Keywords: Nigella sativa, Biologic Yield, Morphological characteristics

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Introduction of planting, holding and harvesting of thyme medicinal plant with an overview of its planting in Ilam province

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Abstract

Thyme with the scientific name of Thymus is one of the dicotyledonous plants. The name of this medicinal plant is derived from the Greek word Thymus, which means courage and strength and can be a symbol for the medicinal effect and healing of this plant. This medicinal plant belongs to the Lamiaceae family and its origin is in the Mediterranean region. Today, it is cultivated in different parts of the world, including Iran. This plant is a perennial plant and grows up to 40 cm in height, and on its small, woody branches, the sharp leaves turn dark green. Is. Thymol is one of the main phenolic compounds in thyme. Thyme can be used as a flavoring and preservative in food. Its very fragrant leaves are often used as a spice or medicine. From the white flowers, its pink color, in summer, it smells of pomegranate. There are countless and different species of this plant. The extract of this plant has a spicy aroma and the new type has more aroma. In Ilam province, about 10 hectares are dedicated to the cultivation of thyme vulgaris, which is planted as a seedling. Its yield is 800 kg per hectare, which due to the properties and economic value of thyme, the planting of this medicinal plant is increasing every year.

Keywords: Thymus, Medicinal plant, Lamiaceae, Timol

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Effect of endophytic fungi *Talaromyces ruber* on *Dracocephalum kotschyi* Boiss germination and growth index

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Abstract

Zarrin Giaheh with scientific name *Dracocephalum kotschy* is introduced as an endangered or rare species for reasons such as hard seed coat and irregular germination due to seed dormancy. Therefore, finding a suitable solution to improve its germination has always been the interest of researchers. Since improving plant growth and increasing tolerance to biological and none-biological stresses are the benefits of endophytes for plants, the role of one species endophytic fungus was surveyed on Zarrin Giaheh germination rate and its growth index. Sterilized seeds were soaked with endophytic fungus suspension with a concentration of 10^6 conidia/ml containing %0.5 Tween20 for 2 hours. For each of the control and endophytic treatments, 3 replications were considered. For each repetition, 25 healthy seeds were placed in each petri dish containing sterile filter paper and kept inside the germinator at a temperature of 20-25 ^oC and a optical period of 16 hours of light and 8 hours of darkness. Finally, germination percentage, germination rate and seed vigor index were calculated according to existing formulas. The results have shown that endophytic fungi have a significant effect on germination rate and seed vigor with 99% confidence.

Keywords: *Dracocephalum kotschyi,* Endophytic fungi, Seed dormancy
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Cytotoxic activities of *Gypsophila ruscifolia*, a native species of west north of Iran

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Abstract

Considering the mortality rate of cancer and the importance of medicinal plants in treating various diseases, the present study was carried out to evaluate the cytotoxic effects of *Gypsophila ruscifolia* on cancerous cell lines to perform phytochemical investigation of the effective fractions. n-Hexane, chloroform, and methanol 80% extracts were prepared, and cytotoxic activities were determined by MTT assay on MCF-7, A-549, HT-29 cancerous and AGO-1522 normal cell lines. The most effective extract was then fractionated, and the fractions with the most cell growth inhibition were selected to isolate natural compounds. Then isolated compounds were also tested on two cancerous cell lines (MCF-7, A-549) and a normal breast cell line (MCF-10A). To understand the cytotoxic effects, apoptosis induction was studied by annexin V/PI assay in the MCF-7 cell line. Fractions 3 and 4 of the root chloroform extract with IC50 values of 71.07 and 60.6 µg/mL showed inhibition of cell growth in MCF-7; fraction 5 with IC50 value of 104.6 µg/mL showed a toxic effect in the A-549 cell line. The treatment of MCF-7 cells with 100 µg/mL of fraction 4 resulted in 52% apoptosis induction. Oleic acid and the mixture of β-sitosterol and stigmasterol were obtained from phytochemical studies of fractions 4 and 5. Stigmasterol with IC50 value of 84.90 µM on MCF-7 cell line and β-sitosterol with IC50 value of 93.84 µM on MCF-7 and 115.98 µM on A-549 cell line exhibited cytotoxic effects. Bioassay-guided fractionation of *G.ruscifolia* isolated and identified three known compounds with moderate cytotoxic effects.

Keywords: Apoptosis; Cell survival; Cell line; Gypsophila ruscifolia; Medicine plant
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Investigation and introduction of combined stabilizing- planting of medicinal plants machine (Soyan)

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Abstract

The increasing of consumption of medicinal plants without the development of suitable planting methods and proper management of planning, will have a worrying consequence, about destruction of nature (water and soil resources). According to increase of cultivation of medicinal plants in these years due to their compatibility with the environment and cheapness, it is necessary to take a big step for mechanized cultivation of medicinal plants. Therefore, the purpose of the present study is to investigate and introduce of developed combination machine for stabilizing cultivate and planting of medicinal plants under different climatic and lands conditions. Combined machine of planting and stabilizing (Soyan) is made of two basic section. The first part of the machine, which provides the secondary cultivate for plant, is including: furrowers, stabilizers, and tape installer, each made of different parts that are held together by a chassis. The second part of this machine includes planting units, which consist: sharp opener, adjustable seed metering unit (plate type), seed box, seed guider and press wheel, and mechanical transmission system. All components of this section are located on a chassis that is connected to the bedding section. The main features of this machine are the adjustable of width and height of the stacks, the depth of tape, the depth of seed placement and the amount of seed which fall with different sizes. This machine has successfully passed the field test and is ready to be offered to the farmers.

Keywords: medicinal plants, Soyan, tape installer, stabilizing cultivate

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Oolong tea, harvest to market

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Abstract

Oolong tea is one of the most popular beverages in China and Japan, which is traditionally produced in semi-fermented form from *Camellia Sinensis*. This tea contains polyphenolic compounds derived from catechins, theaflavins and thearubigin, and due to its rich antioxidant properties, it is used today in other countries of the world. The many health benefits of oolong tea have made this natural beverage an investment goal; because oolong leaves have been shown to be rich in antioxidants that fight free radicals and are used to treat a variety of factors including lowering cholesterol, treating obesity, stabilizing diabetes, preventing osteoporosis and boosting the immune system. Also, modifying the oxidation stages of the production of this tea has increased the quality of its taste and aroma, which has many fans. The present study is a library review study that has been done by reviewing the studies on the benefits and stages of oolong tea production. Since advanced societies today follow a "healthy lifestyle" pattern, and organic compounds have gained much popularity; it is believed that the introduction of new natural compounds can find a good place in the current market. Also, tea, which is one of the most popular beverages in the world, investing in the production and processing of its varieties such as oolong tea, as well as providing by-products of this plant, can have a significant return on investment.

Keywords: Oolong tea, Antioxidant, Natural beverage, Healthy lifestyle

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Interaction Effects of Salt Stress and Salicylic Acid Levels on Physiological Trials of Saffron (*Crocus sativus* L.)

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Abstract

In order to investigate the effect of salicylic acid levels on mitigation of salinity stress in saffron (*Crocus sativus* L.), an experiment was conducted in Torbat Heydarieh during 2015-2016 and 2016-2017. The experiments were performed as split plots based on a randomized complete block design with three replications. Four salinity stress levels such as a_1 (1.5 $dS.m^{-1}$), a_2 (3 $dS.m^{-1}$), a_3 (6 $dS.m^{-1}$), a_4 (9 $dS.m^{-1}$) and four levels of salicylic acid including b_1 (zero (control)), b_2 (0.4 mM), b_3 (0.8 mM), and b_4 (1.2 mM) were considered as the main and sub plots, respectively. The results showed that for the highest salinity rate (9 $dS.m^{-1}$), optimum concentration of salicylic acid increased leaf number and leaf length up to 3 and 20% in first year and with 20 and 32% in the second year, respectively. Also, salicylic acid was declined leaf sodium content up to 40% and leaf potassium content increased up to 38% in the second year. According to the results, salicylic acid caused balances in glucose and proline contents, decreased of Na absorption, prevented disorders of K absorption and enhanced RWC leaves of saffron. In the second year and for the highest salinity level, salicylic acid application increased total chlorophyll up to 20% compared to control. Application of 0.8 mM salicylic acid+ 6 and 9 $dS.m^{-1}$ salinity stress levels increased dried stigma yield (with 1.12 and 2.45 $kg.ha^{-1}$, respectively) up to 81 and 118%, respectively. Therefore, we can suggested that application of 0.8 mM salicylic acid in salinity stress conditions in order to enhance stigma yield and saffron growth and mitigate negative effects under salinity stress conditions.

Keywords: Chlorophyll, Plant growth regulators, Proline.

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Study of the effect of nutrition formula and corm size on quantitative and qualitative characteristics of saffron (*Crocus sativus* L.)

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Abstract

Application of organic and chemical fertilizers in plants has a certain effect, but their combined application is important on plants, especially saffron. This research was conducted to study the response of different weight groups of saffron corm to four types of nutritional management during two growing seasons 2015-2017 at Torbat Heydarieh University as split plots based on a randomized complete block design with three replications. The experimental treatments consisted of four types of nutritional program: control (without fertilizer), second treatment (manure, humic acid, micronutrients, Thiobacillus bacteria), third treatment (blood fertilizer, mono potassium phosphate, iron chelate, humic acid, Delfard fertilizer) and fourth treatment (chicken manure, ammonium nitrate, granular humic acid, urea, NPK 20-20-20 fertilizer, Marmarin fertilizer, Decapa fertilizer, Cotamix fertilizer) as main plot and mother corm weight (include less than 8 gr, between 8 gr and 12 gr and more than 12 gr) as a subplot. The results showed that in the first year of experiment (2015), the effect of different levels of fertilizer on all measured traits was significant. maximum fresh and dry weights of stigma, fresh weight of flowers and number of flowers were obtained in the fourth treatment of the nutrient program and then The third treatment followed by the second treatment of the nutrient program. The most corm weights and diameter corm in the first year (2015) were obtained in the fourth treatment of the nutrient program. The effect of mother corm weight on the measured traits in the first year was significant and its maximum amount was obtained in mother corm with a weight greater than 12 grams. In the fourth treatment, it can be concluded that the application of chicken manure, humic acid, macro elements, as well as micronutrients such as iron, zinc, manganese, etc., have a significant role in increasing the yield of saffron.

Keywords: Humic Acid, Micronutrients, Corm Weight, Dry Weight of Stigma,
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Actors influencing the trade of medicinal plants and their role in the sustainable development of rural communities

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Abstract

The market of medicinal plants has been existed for a long time in the history of the world and its sale and use in traditional medicine is still common. Iran is also very rich and diverse in terms of storing medicinal plants. This diversity has led to the spread of traditional Iranian medicine in this country for a long time and according to the geographical distribution of medicinal plants, there are various markets for its sale and presentation. Thanks to advances in technology and increasing awareness of medicinal plants in the past few decades; Planting, processing and selling products derived from medicinal plants have become industrially popular. As a result, the market for medicinal plants is no longer limited to planting home products and selling them in local and traditional markets, and there are several influential actors in the market structure of medicinal plants; Each of them, according to their position, level and importance, can play a role in the process of sustainable development of rural communities and the sustainability of the ecosystem of medicinal plants. This research has been done by library research method; deals with the actors active in the trade of medicinal plants and their role in the sustainable development of rural communities, and at the end, practical suggestions in this regard are presented.

Keywords: International markets, Export, Local communities, Socio-cultural dynamics.

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Use of valuable medicinal - ornamental plants in the landscape

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Abstract

The uncontrolled expansion of cities has caused environmental pollution and the destruction of urban landescapes. Marginalization and increasing demand for urban land are important factors in the disappearance of landescapes. The present research is descriptive-analytical and its information has been collected and then analyzed by studying books, articles and other authoritative library sources and then analyzed. The purpose of this study is to investigate the use of medicinal-ornamental plants in landescapes. The results of the present study indicated that the use of medicinal-ornamental plants in landescapes had positive economic and entrepreneurial consequences, reducing pollution, reducing water consumption, filling leisure time and public awareness.

Keywords: Medicinal-ornamental plants, landscape, Economy and entrepreneurship, Xeriscaping, Pollution reduction

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the global perspective on medicinal plant research in different countries of the world?

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Abstract

Today, the use of medicinal plants has grown significantly. The use of medicinal plants has been popular since ancient times and today it is also known as the source of modern medicine.This research is a review of all the works listed up to 2019 in the Scopus database with the method of information bibliography and has been analyzed in more than 100 thousand published articles. On the one hand, the countries, institutions and authors of the main researchers in this field, as well as their evolution over time, were identified, and on the other hand, the relationship between authors, countries and subjects was analyzed by identifying communities. Accordingly, the results showed that the number of people who had previously studied unclassified drugs, traditional medicine, cancer, anti-diabetic drugs, animals, and anti-inflammatory reactions had decreased.The results also showed that the global research process, instead of focusing on the cultivation or domestication of plant species, has focused more on research into new drugs, their active ingredients and active ingredients.

Keywords: modern medicine, medicinal plants, worldwide research, Scopus

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Prospects for the use of active ingredients of medicinal plants in food, processing and supplementary industries

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Abstract

In the food industry, maintaining the quality and safety of food is very important and we have always tried to address this concern with a variety of preservatives. For the purpose, synthetic preservatives are used that can have adverse effects on human health. Over the past few decades, the use of natural preservatives has increased and the use of products derived from medicinal plants has recently been tested. In order to investigate the aspects of using the active ingredients of medicinal plants in the food, processing and supplementary industries, a review study was conducted by searching for keywords in scientific databases. The results showed that some herbal products have entered the human table during the past centuries and some need further studies on the interaction between food type and plant composition because the interaction and effectiveness of natural compounds with food can lead to different results. Have. In addition, medicinal plant products can be used in the form of preservatives, coatings and packaging in these industries. Polysaccharide compounds, proteins, fatty acids, essential oils, gels and mucilage, gums, resins and waxes are forms of plant products that have had promising results in the storage or coating or packaging of food products.

Keywords: Essential oils, edible packaging, plant products, secondary metabolites, preservative

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Evaluation of saffron ecotypes yield in climatic conditions of Urmia Lake catchment area

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Abstract

Achieving sustainable production and income and creating employment in the watershed of Lake Urmia due to the water shortage crisis and the need to change the pattern of cultivation and use of plants with low water needs along with economic productivity is one of the goals and programs of the resistance economy. In order to compare and record the yield of onions, flowers or stigmas and achieve sustainable production by cultivating high-yielding ecotypes and other agronomic characteristics and introducing saffron as an alternative crop, this study is a randomized complete block design with 3 replications since September 2017. From the second year, during 5 years, flower yield, stigma production and morphological characteristics such as plant height, number of leaves, stigma length, and in the last year onion yield, and onion weight and diameter will be measured. Simple analysis was performed for each year and combined analysis was performed on the measured traits. Correlation between measured traits including flower, stigma, leaf, onion yield and related characteristics was measured and superior ecotypes were introduced for cultivation in order to reduce water consumption and sustainable agricultural development in the watershed of Lake Urmia. Among the saffron ecotypes, Korgoand ecotype had the highest number of flowers and the highest stigma weight, and Haft Hoz ecotype had the lowest number of flowers and stigma weight.

Keywords: Saffron, Ecotype, Flower, Stigma, Bulb

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The effect of biochars produced from cotton and wheat plant residues on some of macronutrients concentration of Shirazi thyme (*Zataria multiflora*) in calcareous soils

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Abstract

Suitable soil and availability of adequate nutrient elements are necessary for successful plant production. Organic matter and soil amendments that are used in soil reclamation can influence the concentration of nutrient elements. Therefore, this research aimed to evaluate the effect of biochars produced from cotton and wheat plant residues on some of macronutrient concentrations of Shirazi thyme was conducted in a completely randomized design with three replications under greenhouse conditions in a calcareous soil. In this research, the wheat straw and cotton boll have grinded and after their drying, by using a furnace for 4 hours at 400 °C, wheat and cotton biochars have prepared. The treatments included the control (soil), soil + wheat biochar 2%, and soil + cotton biochar 2%. The results indicated that the different treatments did not have a significant effect on the potassium (K) concentration of *Zataria multiflora* root. Application of cotton biochar increased nutrient uptake of sodium (Na), calcium (Ca), and phosphorus (P) by 56.25, 244.62, and 31.25 % as compared to the control, respectively. But the uptake of these macronutrients in wheat biochar treatment was not statistically significant as compared to control treatment. The highest significant positive correlation was found between P and Ca (0.97l**) in the root. Therefore, according to the obtained results, the use of cotton biochar as a superior treatment can be recommended as an appropriate breeding strategy to improve thyme plant growth in calcareous soils.

Keywords: Shirazi thyme, Cotton biochar, Wheat biochar, Macronutrients

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The importance of "*Ziziphus spina-christi*" and improving its propagation using vegetative methods with emphasis on tissue culture technique

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Abstract

Ziziphus spina-christi Medicinal plant is one of the important sources of production of many medicines, cosmetics and industrial products, which have been used by human beings for many years and until today. As time goes by, the needs are its new applications are increasing. Sistan and Baluchestan is one of the top provinces in terms of the importance of medicinal plants, including *Ziziphus spina-christi*. This medicinal plant is rich in natural compounds and has very high antioxidant properties. In Sistan and Baluchestan climatic conditions, in addition to planting and production as a strategic food, it has caused diversity in vegetation and rich natural resources. At the present, the propagation of this plant is done only through seeds. The high percentage of open pollination, causes the differentiation of the traits in the results and it is impossible to establish the superior and desired traits for the beneficiary. This problem can be overcome by asexual reproduction. Micropropagation of this plant using tissue and cell culture technique is one of the practical methods for asexual propagation and mass clonal propagation.

Keywords: Ziziphus spina-christi, Medicinal properties, Asexual propagation, Tissue culture

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The Role of Rural Women Awareness and Knowledge in the Development of Medicinal Plants

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Abstract

Medicinal plants are a group of plants that their organs have compounds with medicinal effectiveness and are using in the pharmaceutical industry due to their therapeutic effects for humans and animals. Until about half a century ago, plants were one of the main sources of drug production, but after the development of knowledge of organic chemistry and efforts to build complex drug molecules, most drugs produced artificially. However, in recent decades, with the observation of side effects of synthetic drugs, the tendency to use medicinal plants has increased so that the 21st century can called the century of study and using of medicinal plants. At present, about one third of the using drugs in human societies are drugs of natural and herbal origin. According to the importance of medicinal plants in the economy and industry of the country, the awareness of rural women and the cultivation and production of medicinal plants by them can be especially important. This project due to the effective and constructive role of rural and nomadic women and the use of their human capital in the process of sustainable development throughout the country implemented in 2019 to 2021. The part of this project goals included the development of sustainable employment in deprived areas with a focus on market management, prevention of natural resource destruction and uncontrolled harvesting of nature with proper training and development of medicinal plants, production of certified and organic medicinal plants, revitalization and development of habitats medicinal plants and increased production, processing, as well as the benefits of medicinal plants in agriculture and natural resources.

Keywords: Sustainable development, rural women, human capital, safflower, medicinal plants.

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Preparation of herbal dressings for healing and treatment of skin burns

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Abstract

One of the prominent causes of death and disability in the world is burns. Burns are defined as tissue damage caused by factors such as heat, chemicals, electricity, sunlight, or nuclear radiation. Burn wound recuperating may be a complex handle counting irritation, epithelialization, granulation, neovascularization, and wound withdrawal. Cutting edge treatments show a expansive number of choices, whereas conventional treatments are promising effective choices. Accelerating the healing process of burns has always been the focus of physicians. Because these wounds usually heal late. Therefore, proper treatment and care of these types of wounds to increase the speed of healing, as well as prevent their chronicity and infection has always been considered. In traditional Iranian medicine, due to the diversity and vastness of the country's vegetation, the use of medicinal plants to improve and treat severe burn lesions with various causes has been common. Various studies have shown the properties of some medicinal plants in healing burn wounds. Plant-based items have been utilized within the treatment of wounds for centuries worldwide. Recently, the components behind many of these conventional treatments may well be clarified in detail. The foremost commonly found components behind the home-grown source items supporting wound mending are for the most part their antioxidant, anti-inflammatory, antimicrobial, cell proliferative, and angiogenic impacts. In this review study, it was found that most of the mentioned plants have beneficial effects on the wound healing process and it seems that the compounds in these plants can be used in the wound healing process.

Keywords: Medicinal plants, Healing, Wound, Skin, Burning

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Sustainability assessment of six crop production systems based on emergy and economic analysis in Hirmand city

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Abstract

Agriculture is critical to a family's livelihood and the development of the national economy. Emergy analysis allows for a comprehensive comparison of different production systems by quantifying environmental and economic input flow to the same unit of solar emjoule (sej).. In this study, Three production systems of fennel, cumin and black caraway in Hirmand County of Iran were assessed for sustainability using emergy and economic indicators. For this purpose17 farms for cumin, 12 farms for fennel and 8 farms for black caraway were selected. Total emergy supporting the production systems of fennel, cumin and black caraway in Hirmand County are 2.29E+16, 1.84E+16, and 1.82E+16 sej ha^{-1}, respectively. Free environmental flows represented respectively 56.16, 56.56 and 52.49% of the total input energy of the production systems of fennel, cumin and black caraway. The large share of free internal inputs indicates that most of the farms studied are non-industrial systems that are traditionally managed and low-input. The values calculated for the sustainability indices (ESI and ESI*) showed that the ecological sustainability of the fennel production system is higher than the other study systems. The main reason for the greater sustainability of this system was the high share of energy input related to free environmental inputs and economic renewable resources. In addition, high emergy exchange ratio (EER), environmental sustainability resulting from the impact on the market, less emergy expended in the production of each unit of production and higher productivity of all production factors indicate a greater comparative advantage of the fennel production system. In the dominant agricultural systems of Hirmand County, special attention to practical solutions for the overall management of production ecosystems, in particular the protection of the soil organic matter and preventing soil erosion can increase the ecological sustainability of these systems.

Keywords: Sustainability assessment, energy analysis, Sistan, productivity, medicinal plants

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The role of antioxidant and antimicrobial potential of bioactive compounds in essential oils in food safety and packaging

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Abstract

Essential oils contain a number of volatile and naturally occurring compounds that are often used as the best alternative in the food industry. Most studies on this subject focus on the effect of essential oils and the role of their main components in the production of food as natural preservatives related to the mechanisms of action. In addition, bioactive molecules in different types of essential oils and their medicinal activities such as antioxidant, antifungal and antimicrobial effects are discussed by examining different mechanisms in food protection. Studies show the active role and effect of various biological antimicrobial and antioxidant activities of essential oils extracted from tea tree, lemon, clove, cinnamon and thyme, which have effectively increased the shelf life of cereal products and increased quality. Major groups in essential oils, such as terpenes and aromatic volatile compounds, play a key role in food safety without adversely affecting quality. In addition, these compounds have various activities such as antioxidants and antimicrobials, can be used as preservatives to increase the shelf life of cereals and crops.

Keywords: Essential oils, terpenes, phenols, preservatives, antimicrobial activity, antioxidant activity

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The effect of using anti-stress treatments on the yield of *Hyssopus officinalis* L.

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Abstract

In order to investigate the effect of anti-stress treatments on the yield of Hyssop (*Hyssopus officinalis* L.) a factorial split-plot experiment was conducted based on randomized complete block, with three factors, the drought stress (25, 50, 75% of the available water discharge from the soil), the foliar application (water, kaolin (2.5%), chitosan (0.4 g/l), glycine amino acid (2.5 per thousand) and foliar application time (vegetative, flowering, just flowering) design at three replications, during 2017-2018 and 2018-2019 growing season in Yazd province. The results showed that the highest yield dry weight (526.32 g/m2) was observed in interaction of mild stress and the foliar application of glycine acid glycine at vegetation and flowering and the highest yield of essential oil (8.67 g/m2) in severe stress and the foliar application of at flowering time to. According to the results, the application of anti-stress substances such as the glycine amino acid can be considered as one of the appropriate strategies to maintain and improve yield in plants under drought stress.

Keywords: Drought, Osmotic potential, Photosynthesis, Essential oil
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Mechanized Harvesting of Green Tea Leaves: Opportunities and Challenges

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Abstract

Economic pressures are forcing organizations to increase employee productivity and reduce production costs. Only competitive businesses can survive. The tea industry is no exception. Increasing harvest speed is one of the ways to increase productivity. Labor costs account for 40 to 70 percent of total tea farm costs. Manual leaf plucking has undergone many changes. Therefore, attracting skilled people becomes more difficult every day. Reducing labor and increasing performance have forced businesses to mechanize harvesting tea. Therefore, it is necessary to identify appropriate mechanized harvesting methods. Mechanized tea harvesting is not a new issue, but planning needs to be done faster. The use of shears was common in Assam and Japan in the late 19th century. In the 1950s, a machine was used to harvest tea in Georgia. Mechanized leaf plucking machines have spread from Japan to other parts of the world. Although these devices are very valuable, due to the topographic conditions, the farm area and the price of the final product is different, it is very difficult to compare one area with another. Therefore, there are several options available to the tea planters, but one should be careful when introducing the new and best machine harvesting system. The direct transfer of technology from one place to another is tempting, but any mechanized agricultural system will rarely succeed if it does not take into account the cultural, economic, and technological conditions of each region.

Keywords: Tea, leaf plucking, mechanized harvesting.

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Factors affecting the quantity and quality of turmeric essential oil (*Curcuma longa* L.)

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Abstract

Turmeric essential oil (Curcuma longa L.) is widely used in various pharmaceutical and food industries. The aim of this study was to optimize the distillation process with water and to investigate the effect of possible changes and various factors including the weight ratio of 10 to 60 g of plant material to 500 ml water volume, pH of distilled water (1, 2, 3, 4, 5, 6, 7, 8), distillation time (1, 2, 3, 4, 5, 6, 7 hours) in the extraction of turmeric essential oil. The essential oil yields of the samples were calculated, then analyzed by GC and GC / MS. Essential compounds were divided into four groups: hydrocarbon and oxygen monoterpenes and sesquiterpenes. The main active ingredient in the essential oil is the four compounds of oxygenated sesquiterpene ar-Turmerone, α-Turmerone, β-Turmerone and (E) α-Atlantone, which were extracted in different amounts by different methods. The results showed that with increasing weight ratio of powder to water, the yield of turmeric essential oil and the amount of β-Turmerone and (E) α-Atlantone have a decreasing trend, but it has no significant effect on the amount of ar-Turmerone and (E) α-Atlantone. By increasing the extraction time from 2 to 4 hours to extract 30 g of essential oil from turmeric, the essential oil yield increased and two compounds β-Turmerone and (E) α-Atlantone increased and two compounds ar-Turmerone and α-Turmerone decreased. Also, the yield of essential oil showed a direct relationship with the amount of four compounds and the optimal conditions for maximum yield (3.5% v / w) and maximum extraction of Turmerones (78.6%), including the ratio of material to water (20 g per 500 ml). (L), extraction time, 3 h and neutral pH were obtained.

Keywords: Turmeric, Essential oil yield, Turmerones, weight, time, pH.

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Prioritization of Export Target Markets of Medicinal Plants (Anise, badian, fennel, coriander)

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Abstract

Development of non-oil exports and liberation from oil monopoly income are the goals of Iran's economic system for independence, self-sufficiency and foreign exchange. In this regard, in order to reduce the vulnerability of economic development goals, expand non-oil exports and diversify export revenues is very important. Increasing global and domestic demand for medicinal plants due to the increasing consumer interest in herbal and traditional medicines, has led to huge business at the national, regional and international levels. Medicinal plants are important due to the high production potential in Iran and the potential development of exports of these products. The purpose of this study is to prioritize the countries importing medicinal plants using the relative import advantage index and several other indicators. The findings showed that the prioritization of countries varies according to different indicators. Therefore, based on the results for designing export promotion programs for selected medicinal plants, it seems more appropriate to emphasize markets with a higher import advantage priority.

Keywords: Relative Import Advantage Index, Non-Oil Exports, Medicinal Plants, Iran.

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Assessing the effectiveness of precision agriculture as a strategy for sustainable development of medicinal plants (Case study: UAV)

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Abstract

Application of advanced and environmentally friendly technologies such as precision farming is one of the important strategies for sustainable development of medicinal plants, especially in arid and semi-arid regions. Precision farming or spatial agriculture is the practice in small areas within fields that optimize it based on the farmer needs. In this farming system, the precision rates of inputs are used at the suitable spatial and temporal scale. UVA (Unmanned Air Vehicle) is a type of precision farming that collects or uses crop information for leaf spraying, foliar feeding and planting. Effectiveness of UVAs include topographic attributes and soil properties, planting, foliar spraying, crop monitoring, irrigation and health assessment. Therefore, based on the increasing trend of medicinal plants such as saffron in different planting patterns, especially in arid and semi-arid regions, it is suggested to use precision farming and UAVs to improve the quantitative and qualitative yield.

Keywords: UVA, Unmanned Air Vehicle, Advanced and environmentally friendly technology, Spatial management

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Comparison response of Iranian fenugreek to gamma ray irradiation and ethyl methanesulfonate under hairy roots culture conditions

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Abstract

Trigonella is one of the medicinal plants with a diverse source of important medicinal metabolites that has a high nutritional value. The use of chemical and physical mutagens can be used to increase metabolic substances.The objective of this study was to compare the response of Iranian fenugreek to gamma irradiation and Ethyl methanesulphonate (EMS) under hairy root culture conditions. Samples of seeds were exposed to gamma ray irradiation at five doses (including 0, 100, 200, 300, 400 Gy) and samples of seeds were exposed to EMS (including 0, 0.1, 0.2, 0.3 and 0.4%). Both experiments were performed in a completely randomized design with three replications. The Agrobacterium rhizogenesis and MS medium were used to induce hairy roots. In this study hair root percentage, root dry weight in normal root and hair and trigonellin content in normal root and hair were evaluated. The results showed that the amount of trigonellin content and root dry weight under both normal and hairy root conditions were the highest in 100 Gy dose of gamma ray and 0.3% EMS. Also, the hair root percentage was the highest in 100 Gy dose of gamma ray and and 0.3% EMS. In conclusion, our results showed that the chemical mutagens have a greater effect on increasing the yield of traits than physical mutagens. Also, high doses of gamma ray radiation have an inhibitory effect on traits. Application of appropriate doses of chemical and physical mutagens can be an effective tool to fenugreek plant breeding program.

Keywords: Iranian fenugreek, gamma ray, Ethyl methanesulphonate, hairy root, trigonellin
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Ultrasonic extraction technology in medicinal plants: systems, opportunities and challenges

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Abstract

The economic and medical importance of medicinal plants for the production of final medicinal products has become increasingly apparent. Many of these products are produced using the extraction method. Environmental requirements and the demand for high quality medical plants products have led scientists to research on the green extraction technologies. Ultrasound assisted extraction as a green technology has been extensively studied for the extraction of active compounds from medical plant materials. In this research, a comprehensive study of extraction of bioactive compounds of medicinal plants with ultrasound-assisted extraction technologies is presented. To have an efficient extraction system, design and process parameters must be carefully studied. However, the scaling up of ultrasonic-based extraction systems does not mean commercializing the technology, and changes in factors such as ultrasonic power, frequency, geometry, and mixing efficiency yield different results. The nonlinearity of ultrasound assisted extraction is the most challenging issue, while scientific research is based solely on a simple ultrasonic reactor design that loses its commercialization efficiency. Also, in different ultrasound assisted extraction conditions, the bioactive compounds obtained have different molecular structures and biological activities. Therefore, future research should focus on the challenges of standardization, industrialization, and commercialization of this technology.

Keywords: Ultrasound; Cavitation; Extraction; Bioactive compounds

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Green synthesis of silver nanoparticles using aqueous extract of *Thymus kotschyanus* Boiss & Hohen and study of their antibacterial potential

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Abstract

The synthesis of silver nanoparticles (AgNP) is a very promising technique because of its wide applicability, especially in the treatment against pathogen microorganisms. The antimicrobial activity from AgNP is mainly due to their large surface area, which results in greater interaction between the nanoparticles and the cells of the microorganisms, inhibiting their growth even at very low concentrations in the medium. In this research Ag NPs are synthesized successfully using flavonoid rich extract of Thymus kotschyanus aerial parts as an environmentally friendly alternative to the toxic chemical reducing agents. The Ag NPs obtained are characterized by ultraviolet-visible (UV–Vis) spectrometer, field emission scanning electron microscopy (FE-SEM), X-ray diffraction (XRD) and Fourier transform infrared spectroscopy (FTIR). FE-SEM analysis revealed the shape of Ag NPs being spherical morphology with an average size range of 20–25 nm. Moreover, Ag NPs prepared in this manner exhibited good antibacterial activity toward Gram-positive (Bacillus subtilis and Staphyloccocus aureus) and Gram-negative (Escherichia coli and Pseudomonas aeruginosa) bacteria, and hence have potential applications in biomedical field

Keywords: Antibacterial potential, Green synthesis, Silver nanoparticles, Thymus Kotschyanu

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Effect of phytogenic feed additive on intestinal morphology and gut microflora in broiler

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Abstract

Restriction on the use of in-feed antibiotics in many countries has fueled the interest in alternative products. A group of natural products known as phytogenic has been the focus of several studies in recent years Phytogenic feed additives, known as PFAs or botanicals, are substances of plant origin added to animal diets at recommended levels with the aim of improving animal performance. Essential oils, herbs and spices all serve as sources for bioactive ingredients, e.g., phenols and flavonoids. In poultry, the effects of antibiotics on growth and overall health of the bird is debated. Past research has shown that antibiotic growth promoters have increased feed intake and growth of livestock birds, however, most noticeable is the effect on feed efficiency. Studies for this reason, focused on the interaction between antibiotics and the natural microflora of the gut as well as the reduction of pathogens leading to infection within the bird. Given that antibiotic resistance is a concern for both the poultry industry and issues of human health, research has become focused on finding alternatives to antibiotics. Such alternatives include are prebiotics, probiotics, enzymes and phytogenic based feed additives. This review is a brief overview of the effects of phytogenic additives on broilers.

Keywords: Broiler; Feed additive; Phytogenic; Growth promoters

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Antioxidant, enzyme activity and antifungal properties of *Satureja khuzistanica* treated by multi-walled carbon nanotubes

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Abstract

Satureja khuzistanica is a medicinal herb from the Lamiaceae family that is endemic to Iran. It is known for its antifungal and antioxidant compounds, especially rosmarinic acid (RA). The study examines the time course impacts of multi-walled carbon nanotubes (MWCNTs) on RA production and the phytochemical and antifungal properties of *S. khuzistanica*. *In vivo,* plants were time-course treated with MWCNTs. RA was measured by HPLC. Catalase (CAT), guaiacol peroxidase (POD), and ascorbate peroxidase (APX) were quantified. DPPH and β-carotene were also assayed. The antifungal effects of samples were evaluated against Fusarium solani K (FsK). The highest RA production was achieved at 24 h MWCNTs. The highest CAT, POD, and APX activities were also observed at 24 h MWCNTs. DPPH and β-carotene showed 50% and 80% inhibition at 48 h of treatment, respectively. The FsK aggregation was the lowest for callus in number of conidia, fresh weight, and dry weight that proved RA inhibitory effects. The callus reduces the FsK growth diameter to 2.75 on the 5th day. The use of MWCNTSs increased RA in *S. khuzistanica* and revealed potential pharmaceutical and antifungal properties.

Keywords: Satureja khuzistanica; Multi-walled carbon nanotubes; Rosmarinic acid; Fusarium solani K**.**

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The plant Scrophularia Striata, a plant desirable for human health

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Abstract

The monkey flower plant with a local name is thirsty and is one of the most important medicinal plants in the monkey flower family. This genus has three subfamilies and 222 genera and 4480 species in the world. The genus of thirst in Iran has 60 species and subspecies of annual, biennial and perennial, of which 28 species are exclusive to Iran. tashnedari is a local word in Kurdish that the root of the word tashne is derived from tash meaning fire and Dari meaning medicine and means fiery medicine. It is a perennial plant with a height of 90-30 cm and standing, numerous stems, with more or less leafy branches, leading to the perch. In Iran, the thirsty plant grows mostly in cold and mountainous areas of Zagros and mainly in Ilam province and parts of Khuzestan province. It is used experimentally in various forms such as decoction, oral, incense, poultice in the treatment of various diseases such as inflammation and infection of the eyes and ears, skin burns, infectious wounds, pain and gastrointestinal disorders. Although the chemical composition of this plant has not been identified, but people living in Ilam province have been using this plant experimentally for many years in various forms such as oral decoction, incense and poultice in the treatment of various diseases. Drinking thirst decoction is used to treat colds and pain and digestive disorders.

Keywords: tashnedari, medicinal plants, scrophularia striata, Zagros, Ilam province
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Microspore embryogenesis induction and secondary metabolite enhancement in sweet pepper (*Capsicum annuum* L.) by putrescine

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Abstract

Doubled haploid in medicinal plants are important in genetic and plant breeding initiatives, however sweet pepper (*Capsicum annuum* L.) is recalcitrant to microspore embryogenesis and doubled haploid generation. Bell peppers are rich in antioxidants, which are linked to improved health and protection against diseases including cancer and heart disease. Peppers are especially high in antioxidant vitamins such as vitamin C, E, and beta-carotene. To break the doubled haploid production barrier, the investigations on sweet pepper microspore embryogenesis were conducted. The impact of varying doses of putrescine (0, 0.5, 1, 2, and 5 mg l^{-1}) on microspore embryogenesis of the two sweet pepper cultivars, including "Inspiration F1" and "Maratus F1," was examined. Using 0.5–1 mg l^{-1} putrescine during mannitol starvation and heat shock treatment (32°C) of isolated microspore culture of "Inspiration F1" cultivar resulted in the largest mean number of multicellular structures, cotyledonary embryos, and regeneration (%). When large amounts of putrescine (2 and 5 mg l-1) were employed, there was a significant drop in microspore embryogenesis efficiency. At 5.0 mg l^{-1} putrescine, microspore embryogenesis was entirely stopped. Putrescine, as a growth regulator, is thought to boost antioxidant activity and secondary metabolite levels. Putrescine is a polyamine commonly found in plants. plants begin a series of chemical changes that increase the expression of polyamines in response to stress, significantly. On the other hand, polyamines stimulated the process of somatic embryogenesis and androgenic responses. Finally, at suitable doses, putrescine improves not only microspore embryogenesis efficiency but also secondary metabolite production in sweet pepper.

Keywords: Doubled Haploid, Capsicum Annuum, Putrescine, Secondary Metabolite

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Application of UAVs in agriculture and in the near future

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Abstract

Although all the sciences are Increasing the developed, but supplying human food is still one of the main concerns of world governors. UAVs have developed significantly in the last decade. It has led to a variety of used for these flying abjects, including agriculture. The majority of applications of UAVs in the field of remote mesuring and the use of cameras and installed sensors an them are in the extraction of agricultural indicators, but UAVs are used in non-measured applications. The use of UAVs in agriculture is developing rapidly and it allows farmers to explore their farm in afew minutes and with spending less time and money do their agricultural affairs. One of the general goals of using UAVs is moveing to words precipion agricultureand and acheiving human food security. this study presented UAVs classifications, their agricultural applications and it has reviewed sam of their adventages and disadvantages. the most important applications of UAVs in agriculture are fild spraying, seeding and removing birds from the farms. various activities, carried out in these fields have been reviewed. finally, it was concluded that the use of UAVs mainly in farms with area and the high value crops is efficient.

Keywords: UAVs , application in agriculture, advantages and disadvantages

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Survey of a Stigma Separator Machine from Saffron Flower

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Abstract

The cultivation area of saffron during the 2020-2021 years was 121250.4 hectares in Iran, of which 1112199 hectares belong to the provinces of Khorasan (Razavi, South and North). The total operation is conducted by conventional methods. So the Study on this subject is necessary. In this study, a machine that separates the stigma of saffron flower was evaluated. This machine was designed and constructed in regional workshops. Performance evaluation of machine includes: determining the moisture content of flower element, the purity percentage, the percentage of saffron stigma in tank and other components (waste) and Capacity of machine (gram/h), all treatment achieved with 8 replications, This machine was compared with traditional treatment in terms of economic aspects. The results showed with respect high humidity difference in the fourth day of the harvest, the best time to separate the stigma from the other parts of the flowers is immediately after harvesting of the flowers in the field. The purity percentage of mechanical method was 40.6% and for conventional method was 97.42% respectively. This method had significant difference with conventional method at 5% level, so, conventional method was the most appropriate method. The machine capacity (500.6 gram Flower/ Hour) had significant difference with conventional method (220gr/h) at the 5% level. Capital Recovery Factor (CRF) on the machine treatment was 26 that were competitive with any economically affordable for farmers.

Keywords: Flower, Machine ,Saffron, Separating of Stigma

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Design and Fabrication of a Fast Harvesting Machine for Rosa Damascene

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Abstract

Rosa flowers harvest from the first of Ordibehesht to the end of Khordad before rising sun and in the cool air of morning. Flowers should be harvested before whitening the petals. Harvesting of the flowers is costly and requires many labors. In the current research, a new mechanism for cutting the flowers and a new vacuum mechanism to intake the flowers were designed in order to conduct them into a tank. The flower harvesting machine consists of cutting system with RGB color sensor, the flexible tube, a vacuum tank, a vacuum solenoid valve, a battery and a mobile frame which all components assembled on it. The body of cutting unit was produced by a 3D printer and the other parts of this unit were built from steel. Static and dynamic analysis was accomplished for the cutting mechanism before its designing and fabricating.

Keywords: Rosa damascene, Fast harvesting machine, Vacuum mechanism, Color sensor. Cutting unit

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Effect of foliar application of Potassium Silicate on some growth parameters, photosynthetic pigments and antioxidant activity of Cape gooseberry (*Physalis peruviana* L.) under salinity stress

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Abstract

Soil and water salinity is one of the major problem for crop production in arid and semiarid lands. Nowadays, the application of proper inorganic nutrition methods such as the use of compounds containing silicon (Si) to ameliorate deleterious effects of different stresses on plants has received considerable attention. So to study the effects of NaCl salinity stress (0, 25, 50 and 75 mM) and foliar application of potassium silicate (0, 150 and 300 mg/l) on some morpho-physiological and biochemical characteristic of Cape gooseberry (*Physalis peruviana* L.), a pot experiment was conducted using a factorial based on completely randomized design with three replications. The results showed that salinity treatments significantly decreased growth parameters (such as stem length, stem diameter, number and length of axillary shoots), chlorophyll and carotenoid content while total antioxidant capacity (by DPPH method) was significantly increased. The foliar application of potassium silicate increased growth parameters and photosynthesis pigments and decreased total antioxidant capacity. Overall, the findings of this study showed that the adverse effects of salinity stress on growth and physiological characteristics of Cape gooseberry can be alleviated by foliar application of potassium silicate.

Keywords: NaCl salinity, Silicon, Chlorophyll, Antioxidant activity, Growth parameters

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Application of aromatic compounds of medicinal plants in dairy products

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Abstract

Today, many plants with aromatic and flavoring compounds are used in food processing. Several medicinal plants have been identified with therapeutic properties such as antioxidant, anti-inflammatory, anti-diabetic, antihypertensive and antimicrobial activities. Enriching dairy products with aromatic and flavoring compounds can help provide dairy products with nutritional and medicinal value. Aromatic plants are also used to improve the appearance and attractiveness of fortified foods for consumers and increase their sales. In addition, for dairy food safety against contaminating microorganisms, plants with the mentioned potentials can be added to dairy products. In this study, we have tried to review the latest developments in the application of aromatic compounds in dairy processing regarding the addition of various herbs and spices and the use of various forms (such as powder, fresh, extract, essential oil) of medicinal plants in dairy. has taken.

Keywords: Food science, aromatic plants, antimicrobial potential, dairy products, antioxidants

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Effect of foliar application of Potassium Silicate on some quantitative and qualitative characteristics of Cape gooseberry (*Physalis peruviana* L.) fruit under NaCl salinity

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Abstract

Soil and water salinity is one of the most important environmental factor limiting plants growth and productivity in the world. Therefore, the development of methods and strategies to induce stress tolerance or ameliorate deleterious effects of salinity stress on plants has received considerable attention. Silicon (Si) is a non-essential mineral nutrient that its role has been well documented in amelioration the negative effects of different environmental stress. So to study the effects of NaCl salinity stress (0, 25, 50 and 75 mM) and foliar application of potassium silicate (0, 150 and 300 mg/l) on some physicochemical characteristics of Cape gooseberry (*Physalis peruviana* L.) fruit, a pot experiment was conducted using a factorial based on completely randomized design with three replications. The results showed that salinity treatments significantly decreased fruit growth parameters (length, diameter and weight of fruit), total soluble solids (TSS) and vitamin C content while carotenoid content and total antioxidant capacity (by DPPH method) was significantly increased. The foliar application of potassium silicate increased fruit growth parameters, TSS and vitamin C content and decreased total antioxidant capacity of fruit. Overall, the findings of this study showed that the adverse effects of salinity stress on physicochemical characteristics of Cape gooseberry fruit can be alleviated by foliar application of potassium silicate.

Keywords: Salinity stress, Silicon, Antioxidant activity, Total soluble solids, Vitamin C
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Pharmacological effects of basil (Ocimum basilicum L.) in traditional and modern medicine

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Abstract

Basil with the scientific name (Ocimum basilicum L.) from the mint family (Lamiaceae) is used as a well-known medicinal plant in Iran. It is also consumed orally in large areas of the world. Basil contains several compounds such as monoterpene, sesquiterpene, triterpenoids and flavonoids. In traditional medicine, this plant is used as a laxative, diuretic, anti-flatulence, to relieve stomach pain and stimulants. Basil also has insecticidal properties, repelling mosquitoes, bedbugs, snakes and scorpions. Basil essential oil is widely used in food industry, perfumery, oral and dental products in traditional medicine. Today, antioxidant, anti-inflammatory, analgesic, anti-anxiety, anti-depressant, anti-apoptotic and anti-diabetic properties have been observed for this plant. According to the evidence, basil and its active ingredients have protective and moderating effects on various injuries, especially cerebrovascular and cardiovascular in internal and external studies. These desirable properties promise the presence of this medicinal plant in the future as a therapeutic agent in various diseases. To achieve this, more clinical trials and studies are needed.

Keywords: Basil, Flavonoids, Monoterpenes, Pharmacology, Sesquiterpene, Triterpenoids

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Effect of iron nano elicitors and growth regulators on callus production in *Ephedra major*

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Abstract

Ephedra major is a valuable source of ephedrine alkaloids that tissue culture is a new method for cultivating this plant and producing its secondary metabolite. For this purpose, studied the effect of iron nano elicitors and plant growth regulators (2,4-D) and kinitin on callus growth of Ephedra in in vitro condition. This expriment was Factorial experiment in a completely randomized design with three replications and treatments including iron nanoparticle eliminators at three levels (control, 10 and 15 mg / l iron nanoparticles), 2,4-D and Kin at levels (zero, 1 and 2 mg / l).) in the culture medium of MS . The results showed that the effect of iron nanoparticle elicitor on fresh and dry weight of callus, secondary callus diameter was significant at the level of 1% probability. The highest fresh and dry weight of callus and were observed in the treatment of 10 mg / l of iron nanoparticles and the optimal medium for callus growth was culture medium containing 2 mg / l of Kin and 2,4-D. Overall, the results indicate a positive effect of low levels of iron nano elicitors on callus growth and poduction.

Keywords: Tissue culture, callus growth, secondary metabolites, Nano-elicitors

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Effects of cold stress and seed scratching on seed germination and some growth related characteristics of wild pistachio (*Pistacia atlantica* Desf.)

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Abstract

Seed germination and growth of primary seedlings of wild piatachio (*Pistacia atlantica*) occur unsatisfactorily in normal conditions due to the hard coating of seeds. To study the effects of seed scratching and cold stress on seed germination and some growth related characteristics of wild pistachio, an experiment was carried out in laboratory conditions at Seed and Plant Improvement Institute in 2012. Four treatments of cold durations (5, 10, 15 and 20 days maintainance of seeds) were examined on healthy and scratched seeds. In each treatment, 400 seeds of wild pistachio, in four replications, were placed on wet filter papers in petri dishes and maintained in refrigerator at 5ºc for the mentiond durations. At the end of each maintainance period seed germination percentage of each treatment was determined and seeds were soil in pots. Ten day after planting, length, fresh weight and dry weight of seedlings root and stems were measured. Scratched and healthy seeds maintained in laboratory conditions were considered as cheks for each treatment. Analysis of variance of data showed significant differences at 5% probability level among treatments for all measured characteristics. Seed scratching increased seed Germaniation percentage. In healthy seeds maintain in normal conditions (check treatment) seed germination percentage was low and occasionally produced seedlings were weak and had no further growth. In scratched seed germination and seedlings growth were much more better. Cold treatments increased seed germination in both healthy and scratched seeds, but its effects on scratched seeds were higher than on healthy seeds. The highest seed germination occurred in 10 and 15 days cold treatments. Cold had also a positive effect on seedlings growth. In healthy seeds, the highest values of length, fresh weight and dry weight of seedlings stem (8.28 cm, 17.49 g and 16.01 g, respectively) and seedlings roots (4.27 cm, 10.91 g and 7.56 g respectively) were obtained in 10 days cold treatment. In scratched seeds, the highest values of stems traits (4.05 cm, 2.16 g and 0.44 g, respectively) belonged to 15 days cold treatment and values of root traits (4.63 cm, 0.83 g and 0.17 g, respectively) belonged to 10 days cold treatment. Seed scratching had negative effects on seedlings growth after germination. Length, fresh weight and dry weight of stems and roots of seedlings in all cold treatment of scratched seeds were significantly lower than those of healthy seeds. Generally, the results of the present study showed that although seed scratching could increase percent of seed germination, but it decreased the further growth of seedlings. Cold stress for 10 and 15 days alone, increased both seed germination and seedlings growth.

Keywords: Kermanshah, strawberry, yarrow, safflower, climatic conditions

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Effect of iron nano elicitors and growth regulators on callus production in *Ephedra major*

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Abstract

Ephedra major is a valuable source of ephedrine alkaloids used as anti-asthmatic medicine. In this research, studied the effect of iron nano elicitors and plant growth regulators (2,4-D) and kinitin on callus growth of Ephedra in in vitro condition. This expriment was Factorial experiment in a completely randomized design with three replications and treatments including iron nanoparticle eliminators at three levels (control, 10 and 15 mg / l iron nanoparticles), 2,4-D and Kin at levels (zero, 1 and 2 mg / l).) in the culture medium of MS . The results showed that the effect of iron nanoparticle elicitor on Total alkaloid content was significant at the level of 1% probability. The highest Total alkaloid content of callus were observed in the treatment of 10 mg / l of iron nanoparticles and the optimal medium for callus growth was culture medium containing 2 mg / l of Kin and 2,4-D. Overall, the results indicate a positive effect of low levels of iron nano elicitors on poduction of Total alkaloid content.

Keywords: Tissue culture, callus growth, secondary metabolites, Nano-elicitors

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Effect of Cold Stress and Seed Scratching on Germination and Some Growth Characteristics of pistacia Seedlings

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Abstract

Seed germination and growth of primary seedlings of wild piatachio (*Pistacia atlantica*) occur unsatisfactorily in normal conditions due to the hard coating of seeds. Investigation of the effects of seed scratching and cold stress on seed germination and some growth related characteristics of wild pistachio, an experiment was carried out in laboratory conditions at Seed and Plant Improvement Institute in 2012. Four treatments of cold durations (5, 10, 15 and 20 days maintainance of seeds) were examined on healthy and scratched seeds. In each treatment, 400 seeds of wild pistachio, in four replications, were placed on wet filter papers in petri dishes and maintained in refrigerator at 5ºc for the mentiond durations. Finally of each maintainance period seed germination percentage of each treatment was determined and seeds were soil in pots. Ten day after planting, length, fresh weight and dry weight of seedlings root and stems were measured. Scratched and healthy seeds maintained in laboratory conditions were considered as cheks for each treatment. Variance of data showed significant differences at 5% probability level among treatments for all measured characteristics. Seed scratching increased seed germination percentage. In healthy seeds maintain in normal conditions (check treatment) seed germination percentage was low and occasionally produced seedlings were weak and had no further growth. In scratched seed germination and seedlings growth were much better. Cold treatments increased seed germination in both healthy and scratched seeds, but its effects on scratched seeds were higher than on healthy seeds. The highest seed germination occurred in 10 and 15 days cold treatments. Cold had also a positive effect on seedlings growth. In healthy seeds, the highest values of length, fresh weight and dry weight of seedlings stem (8.28 cm, 17.49 g and 16.01 g, respectively) and seedlings roots (4.27 cm, 10.91 g and 7.56 g respectively) were obtained in 10 days cold treatment. In scratched seeds, the highest values of stems traits (4.05 cm, 2.16 g and 0.44 g, respectively) belonged to 15 days cold treatment and values of root traits (4.63 cm, 0.83 g and 0.17 g, respectively) belonged to 10 days cold treatment. Seed scratching had negative effects on seedlings growth after germination. Length, fresh weight and dry weight of stems and roots of seedlings in all cold treatment of scratched seeds were significantly lower than those of healthy seeds. Generally, the results of the present study showed that although seed scratching could increase percent of seed germination, but it decreased the further growth of seedlings. Cold stress for 10 and 15 days alone, increasedboth seed germination and seedlings growth.

Keywords: Pistacia atlantica, Germination, Cold stress, Seed scratching

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Refractance window dehydration technology a novel drying method in the medicinal plants industry

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Abstract

New drying methods will have a positive impact on the food industry in terms of scalability, energy efficiency, cost and quality of the final product in the future. Drying by refractance window method is one of these methods that has attracted a lot of attention in recent years due to its many benefits. This technique is useful for heat-sensitive, delicate and valuable products such as some herbs. In this method, the temperature of the products is kept low and rapid drying occurs, because all three modes of heat transfer are present. Refractance window drying has found many applications not only in the food industry but also in the pharmaceutical, food, cosmetics and pigment industries. Due to rising energy costs, the food industry is moving towards optimizing fuel and energy consumption. Research shows that aromatic and active pigment compounds to which sensory and nutritional properties are related can be preserved in this technique. The purpose of this study is to present the recent trends in drying medicinal plants by Refractance window method with emphasis on the basic mechanism and the impact on product quality.

Keywords: Windows refraction, modern drying, medicinal plants.

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Effect of application of A200 superabsorbent modifier and irrigation cycle on some morphological characteristics of Capparis spinosa

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Abstract

Caper is a plant of the genus Caparidaceae. Drought stress is one of the most important problems of plant production in arid and semi-arid regions of Iran. This study was conducted to investigate moisture stress and different levels of superabsorbent on survival and some morphological characteristics of Caper in a completely randomized block design with 12 treatments and three replications. The results of analysis of variance show a positive effect of superabsorbent and drought stress on all measurement parameters. The results of comparing the mean of the data showed that with increasing the level of superabsorbent (225 g per pit), the survival rate of plants increases. This study showed that Caper plants that were watered every month dried up. The highest number of lateral branches (17) was observed in the treatment without superabsorbent with irrigation cycle once every two months and the lowest number of lateral branches was observed in the treatment of 225 g of superabsorbent without irrigation. The highest collar diameter (5 mm) was observed in 225 g superabsorbent treatment and irrigation once every two months and the lowest amount (2.3 mm) was observed in 75 g superabsorbent treatment with irrigation once a month. The highest wet and dry weight (48.8 and 25.33 g respectively) was observed in 150 g superabsorbent treatment with irrigation cycle every two months and the lowest value (3.82 and 2.08 g respectively) in 75 g superabsorbent treatment with irrigation cycle once every two months. It was concluded that by using superabsorbent, acceptable performance components can be obtained by using less water, and the treatment of 225 g of superabsorbent was more effective for cobra survival percentage.

Keywords: Drought stress, Survival, Caper, Irrigation

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Delta_9_tetrahydrocannabinol and Curcumin as Two Herbal Ligands for inhibit HIV_1 Protease_, Integrase_ and Reverse_Transcriptase with Molecular Docking Studies

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Abstract

HIV_1 is a human immunodeficiency virus, which has three enzymes, Integrase (IN), Protease (PR) and Reverse_transcriptase (RT). Inhibitor pattern of two herbal ligands include Curcumin (CRC) and Delta_9_tetrahydrocannabinol (THC) with HIV_1 enzymes were investigated by using molecular docking. These ligands are chosen base on the Lipinski's rules as an herbal inhibitor of HIV_1 virus. We found that CRC and THC ligands have similar orientation in active sites of IN, PR, and RT enzymes. The highest binding energy between PR, IN and RT with CRC and THC ligands are –8.8 and –8.7 Kcal/mol, respectively that reported for PR enzyme. Residues Asp25, Asp29, Asp30 placed in very important catalytic region in both chains of protease enzyme including the central domain which have H_bond with curcumin and THC. Moreover, residue Ile50 is the most flexible region of protease enzyme which plays a significant role in catalytic activity that has interaction with CRC and THC.

Keywords: Curcumin, Delta_9_Tetrahydrocannabinol, Docking, Integrase, Protease, Reverse_Transcriptase

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Hairy root culture in different bioreactors to extract secondary metabolites

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Abstract

Drugs are chemicals, and many of these chemicals can be obtained from plants as secondary metabolites. Extraction of secondary metabolites from medicinal plants is usually not economical due to the need for a large area under cultivation. Therefore, bioreactors cultivation is an alternative method to extract secondary metabolites economically. Bioreactors are culture vessels under sterile conditions in which cells, plant tissue, somatic embryos, etc., can grow under controlled conditions and free of contamination. The delicate and fragile structure of hairy roots, high sensitivity to environmental conditions and their changes, uneven growth of hairy roots, and inhomogeneous conditions within the bioreactor have made the structure of bioreactors for hairy root culture have more proportionate considerations. In this study, different bioreactor structures and their effects on hairy root culture have been discussed.

Keywords: Tissue culture, bubble column bioreactor, airlift bioreactor, gas-phase bioreactor.
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Investigation Modern Methods of Extraction of Medicinal Plants: A Review

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Abstract

Medicinal plants are important as one of the most important primary sources for various industries including food, medicine and cosmetics. Essential oils, secondary metabolites of aromatic plants, are valuable compounds that are widely used in many industries. Researchers have discovered various aspects of these natural substances, including biological activity, health effects, potential applications, and methods of their separation. Recovery of volatile components of aromatic plants, i.e. extraction, is an important step in the production of essential oils and plant extracts, because it can affect the quantity and quality of essential oils. For example, improper extraction methods and conditions may degrade valuable chemicals and adversely affect the physicochemical properties of the extracted essential oils. It also leads to reduced extraction performance, increased energy consumption and a longer extraction process. At present, common extraction methods, such as steam distillation and hydraulic distillation and solvent extraction, are widely used in the extraction of essential oils from aromatic plants. However, there are problems. These issues have led to research into the need to replace new extraction methods. The use of modern methods has significant advantages over conventional methods and plays an important role in the production of high quality essential oils and plant extracts for the consumer. In this article, the principles of different extraction methods, their advantages and disadvantages are examined.

Keywords: New extraction processes, Ohmic heating, Microwave heating, Essential oil, Medicinal plants.

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Induction of drought stress resistance to seeds of seven species *Allium* L. by Polyethylene glycol

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Abstract

Onions and garlic are the most important components of the daily diet of the people of the world. These herbs have long been used to treat traditional ailments such as headaches, fever, bites, intestinal worms, cholera, diarrhea and tumors. In the present study to evaluate drought resistance at germination stage and to create different levels of water potential from polyethylene glycol 6000 at concentrations of -0.3, -0.6 Mpa, -0.9 and -1.2 Mpa on the seeds of seven species of *Allium* L, including *A. cristophii* Trautv., *A. giganteum* Regel, *A. longisepalum* Bertol, *A. pseudobodeanum* RM Fritsch & Matin, *A. stipitatum* Boiss., M.B. *A. rubellum*, M.POP. & Vved. *A. vavilovii* was used. The results of analysis of variance showed that the effect of species, treatment and interaction of species on treatment on all germination indices were significant at the level of 1%. The results of comparing the traits between species showed that dormancy duration, root and seedling length, root to shoot ratio and seed vigor index of *A. pseudobodeanum* had the highest value compared to other species. The duration of germination, shoot length, fresh and dry weight of seedlings, dry matter percentage and all germination indices of *A. giganteum* had the highest values. The results of traits between the mean of treatments showed that the duration of dormancy of control seeds was less and also the studied traits and germination indices were higher in control than other treatments. In general, polyethylene glycol -0.6 Mpa and -0.9 Mpa increased the duration of dormancy and polyethylene glycol -0.9 Mpa and -1.2 Mpa decreased the germination duration and germination indices. The results of cluster analysis divided the seven species of *Allium* into two clusters. *A. vavilovii* and *A. cristophii*, which were located in cluster one, had longer dormancy and no germination in most treatments. *A. stipitatum, A. giganteum, A. rubellum, A. longisepalum and A. pseudobodeanum* were in the second cluster with similar performance of germination indices. Due to the fact that these species are of great agricultural, medicinal and ornamental value, the results are used in breeding and production of suitable varieties in various fields.

Keywords: Polyethylene glycol, Dormancy duration, Germination index, Morphological traits, Cluster analysis.

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Analyzing the Effects of Medicinal Plants Development on the Sustainability of Agricultural Sector in Iran

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Abstract

The agricultural sector is one of the most important economic sectors of the country, which plays an indispensable role in creating food security, employment, income generation and export. This sector sustainability, especially in recent years, has been threatened for various reasons such as climate change, water shortages, soil erosion, improper use of inputs and migration of villagers. This trend along with increasing pressure to ensure sustainable food security can lead to catastrophic consequences. Therefore, developing appropriate solutions to develop the agriculture sector sustainability has always been a concern of policy makers and planners. Development of medicinal plants cultivation, is one of these strategies, which can play a vital role in maintaining public health, creating employment and economic development. Regarding to ecological compatibility with Iran conditions, appropriate capabilities in processing, storage and export, rich indigenous knowledge about the cultivation and consumption of medicinal plan in rural and nomadic areas, medicinal plants cultivation development can facilitate economic, social and environmental dimensions of the agricultural sector sustainability. This mostly occurs through water resources sustainability and cultivation pattern, conservation of genetic resources and biodiversity, rangeland sustainability, export development, reducing inputs consumption, producing healthy products, improving rainfed and low-yield lands value creation, the sustainability of rural settlements and the empowerment of local communities and the development of rural tourism and the creation of alternative sustainable income creation. In this review paper, the role of medicinal plants in suitability of agricultural sector have been addressed.

Keywords: Medicinal Plants, Economic Sustainability, Social Sustainability, Environmental Sustainability.

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Analysis of the challenges of cultivating medicinal plants among farmers in Zabol city

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Abstract

The aim of this study was to identify the challenges of cultivating medicinal plants in Zabol city. The sample size included 8 agricultural jihad experts in Zabol city and 6 farmers in this city. Which were selected through targeted snowball sampling. To collect the data, semi-structured interviews were conducted which were analyzed by qualitative content analysis with systematic coding using Maxqda 12 software. The results included 21 challenges that were summarized in the form of 5 main challenges: climate challenges, equipment challenges, economic challenges, trade union challenges, information-educational challenges, and policy challenges.

Keywords: Medicinal plants, Zabol city, rural economy

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Investigation of the effect of drying temperature on weight loss and color of Mohammadi flower petals

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Abstract

Mohammadi flower is one of the medicinal plants that has many uses. If this product is not dried properly after harvest, its petals will be damaged and their color will be undesirable. In this study, the aim was to determine a suitable method for drying rose petals. For this purpose, the flowers were dried after harvesting at 25 and 55 degrees Celsius and their moisture content and color were investigated. A completely randomized design was used for statistical analysis of the results. The results showed that the effect of temperature and drying time on the reduction of moisture and color of rose petals is significant ($p < 0.01$). After 2 hours, the sample at room temperature lost 1.081% and the sample at 55 ° C lost 3.428% of its weight. The rate of moisture loss for the dried sample at room temperature after 12 hours was 6.126% and for the dried sample at 55 ° C was 6.095%. After 24 hours of drying at 25 ° C and 55 ° C, the moisture loss of the samples was 0.386 and 0.482%, respectively. Regarding the color characteristics, it was observed that the color of the dried petals at 55 ° C was lighter than the color of the dried samples at 25 ° C, but with increasing drying time, the color of the samples was darker.

Keywords: Drying, Mohammadi flower, Medicinal plants, Color characteristics.
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Investigation of phytochemical and fatty acids properties in Iranian borage

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Abstract

Iranian borage (Echium amoenum Fisch & may) belongs to the borage family and is native to Iran. In this study, vegetative and reproductive characteristics, flower yield, 1000-seed weight, oil percentage, physicochemical properties of oil, phytochemical properties (anthocyanins, flavonoids, phenols and tannins), measurement of type and amount of fatty acids, percentage and type of essential oils and flowers Iranian borage was mentioned in Eshkorat region of Gilan province. Experiments related to morphological traits and growth and yield characteristics were performed in a randomized complete block design with three replications and in other characteristics evaluated in existing populations with different geographical coordinates, the results It was reported as a harvest from nature. Phytochemical compounds were measured by spectrophotometer and the amount of seed oil was extracted by Soxhlet and analyzed by GC. The results showed that the amount of phytochemical compounds was affected by altitude and populations at higher altitudes had the highest The compounds were phytochemical. In fatty acid experiments, eleven fatty acids were identified, most of which were unsaturated fatty acids. And alpha-linolenic acid (omega-3) (39%) was the major component of the oil in this plant. The physicochemical properties of the oil were also reported as follows: oil refractive index 1.463, acid number 1.6, peroxide number 1.28, iodine number 100.9, soap number 168, moisture content 1.82% chlorophyll content 15.3 and its pH 6/5 was calculated.

Keywords: Persian borage, anthocyanin, fatty acids, phenolic compounds.

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Comparison of total phenol content, flavonoids, antioxidant and antimicrobial properties of aqueous extract of Pleurotus eryngii and Ganoderma

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Abstract

The aim of this study was to investigate the total phenolic and flavonoid content, antioxidant activity, and the antibacterial effect of both Pleurotus eryngii and Ganoderma on the microorganisms including gram-positive bacterium and gram-negative bacterium. In this study, the content of phenolic, flavonoid compounds, and antioxidant activity were analyzed. The amount of phenol was assessed using Foling method and amount of total flavonoids was measured by the aluminum chloride method. Ain addition to, antioxidant activity was calculated by DPPH method and antibacterial activities was measured by disk diffusion method. The amount of phenol and flavonoids for Pleurotus eryngii was 28.7 and 8.1 and for Ganoderma was 7.8 and 6.2 respectively. Furthermore, Pleurotus eryngii extract showed significant antimicrobial properties in comparison to Ganoderma extract. In general, the results of this study showed that Pleurotus eryngii extract has a significant advantage in phenolic compounds, antioxidant properties, and antimicrobial activity compared to Ganoderma extract.

Keywords: Pleurotus eryngii, Ganoderma, phenol, flavonoid

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Increasing the storage time of saffron flowers by using new storage systems (Atmospheric control system)

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Abstract

Saffron flowers in two accumulation thicknesses (10 and 15 cm) under three gaseous compounds of 30% carbon dioxide, 5% oxygen (A1) and 50% carbon dioxide, 5% oxygen (A2) and 70% carbon dioxide, 5% oxygen (A3) at two temperatures of 0 and 15°C were stored for 15 days. Every three days, saffron extraction efficiency and physical properties (weight loss and wilting percentage, stigma length and diameter) were measured. The quality of saffron flowers was maintained in atmospheric control warehouses for 15 days, but the quality of control samples decreased sharply after 9 days. Saffron extraction efficiency and physical properties of saffron with 10 cm accumulation thickness and A2 gas composition were better at 0°C. In order to achieve the right combination of gases to increase the shelf life of agricultural products in laboratory conditions, a chamber equipped with a refrigeration system with controlled atmospheric conditions was designed and built that allows the injection of gases automatically using the cup control system. Finally, the automatic gas injection and control system was technically evaluated by applying three gas combinations and three refrigeration temperatures. The results showed that the gas injection system with an average error of 17.55% has the ability to adjust the gas composition inside the refrigeration chamber. The average error of the refrigeration system relative to the set temperature was 19.87%.Evaluation of the performance of the device in storing saffron flowers in a 15-day period showed that saffron flowers suffered a weight loss of 4.598% and an increase in wilting percentage of 43.696. The levels of crocin (stigma color), safranal (fragrance) and picrocrocin (taste or bitterness) of stored saffron stigmas also decreased by 17.7%, 37% and 61%, respectively.

Keywords: Control atmosphere store, saffron yield temperature, thickness height.

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The significance of economic marketing of medicinal plants

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Abstract

The tendency of developed countries to use herbal products and its increasing consumption in the world, in the pharmaceutical, food and cosmetic industries, and considering the diversity of the country's climate and the possibility of growing most plants in it, has provided a golden opportunity to enter the global market for our country. Today, the engine of economic society development is entrepreneurship. Proper marketing research can provide the necessary grounds for increasing added value and more production and market management of these products. Medicinal plants are one of the valuable Iran natural resources that if scientifically recognized, cultivated, developed and exploited properly can play an important role in public health, job creation and non-oil exports. In this context, identifying entrepreneurial opportunities is of particular importance. By creating and expanding appropriate and reputable brands, improving quality as well as providing advice, it is possible to provide the use of medicinal plant products and increase their use. Identifying products that have a more appropriate target market and market-based production planning along with training and promotion can reduce the problems of manufacturers. Conducting marketing studies are necessary to organize the production cycle and introducing high quality and market-friendly products. In this research, while expressing the applications of medicinal plants in the country's economy, the factors affecting the production, distribution and marketing of medicinal plants were considered.

Keywords: Medicinal plants, marketing, economic development, entrepreneurship

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Study of the effect of mycorrhiza species on growth and photosynthetic pigments of lemongrass

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Abstract

Biological agriculture is a recognized means for agricultural production that agricultural ecosystem health at the same time promote to healthy food production. Karela is a plant with multiple medicinal properties of the fruit is used to control diabetes. To evaluate the effects of biological and chemical fertilizer on quantitative and qualitative characteristics of medicinal plant Karela, experimental randomized complete block design with three replications in Zabol University Agricultural Research Institute was conducted. The treatments were: control or 100% chemical fertilizer (urea 180 kg/ha + phosphate mono-ammonium 100 kg/ha + Potassium 100 kg/ha) (F1), nitroxin + phosphate fertilized 2 (F2), nitroxin + fertilized phosphate 2 + 75 % chemical fertilizer (F3), nitroxin + fertilized phosphate 2+ 50% chemical fertilizer (F4), nitroxin + fertilized phosphate 2 + 25% chemical fertilizer (F5), nano-bio-fertilizer (F6), nano-bio-fertilizer + 75% chemical fertilizer (F7), nano- bio-fertilizer and 50% chemical fertilizer (F8) and nano-bio-fertilizer + 25% chemical fertilizer (F9), respectively. Means comparison showed significant superiority of the combination of biological and chemical fertilizers used to separate the used of this fertilizers. The results of the data analysis showed that different levels of chemical fertilizers with bio fertilizers had significant effect on photosynthesis pigments, carbohydrate and fruit yield per square meter. F3 treatment able to allocate the highest amount of flavonoids. Most of the fruit yield earned at F4 treatment that compared to the control treat ment was 25/33 percent increased. alsoThe amount of nitrogen, phosphorus, potassium, calcium, manganese fruit and zinc grain were significantly affected by treatments.

Keywords: Medicinal plant, photosynthetic pigment, dry weight, mycorrhiza and food safety

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Interaction of Conservation Tillage and Weed Control on Yield and some Agronomic Characteristics of *Cucurbita pepo* L.

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Abstract

This study was conducted to evaluate conservation tillage systems and weed management methods in the form of a split plot design based on randomized complete blocks with 3 replications in the 1398 crop year in two locations with a radius of 120 km. In this experiment, the main plot included conservation tillage at 4 levels including(conventional plowing, zero plowing, chisel, disc) and the sub-plot of weed management at 4 levels including(herbicide use, weed-free, uncontrolled and control) Was considered. Plant length, number of sub-stems, fruit diameter, number of seeds per fruit, biological yield, grain yield, oil yield, protein yield and grain yield were measured. According to the results of analysis of variance, the three interactions of the region, tillage and weed management on all studied traits except grain yield were significant. The highest number of seeds(211.7), biological yield(7.6 t/ha), oil yield(83.3 kg/ha) and protein yield (34.7 kg/ha) under the influence of chisel and free of Weed was observed in Khoy region and the lowest number of seeds(114.7), biological yield(1.01 t/ha), oil yield(19.7 kg/ha), protein yield (1.7 kg/ha) under the influence of disc and uncontrolled treatment weeds were in the Mako area. Seed yield was significant only at the level of one percent probability due to the interaction of tillage and weed management. Also, the highest grain yields(828.6 kg / ha) was observed under the influence of chisel and weed-free treatments and the lowest(756.5 kg / ha) was observed in disc treatment without weed control. In general, comparing the mean effects of experimental treatments showed the superiority of tillage treatment with chisel and weed management(weed free).

Keywords: Conservation tillage, biological yield, oil yield, grain yield, weeds.

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The condition of medicinal plants in the country with emphasis on export challenges.

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Abstract

Due to the geographical location and climatic diversity of Iran has a variety of known species of medicinal plants, the benefit of this divine gift in recent years has been considered so that in the national document of medicinal plants and traditional medicine, the perspective Twenty years of the Islamic Republic of Iran (Horizon 1404), the first rank of exports of medicinal plants and herbal products in the region has been determined for the country.Also in the mentioned document, the increase of export of these plants and its products has been proposed to be among the top 10 countries in the world. Therefore, since it is necessary to study the export status of these products, the present study was conducted to investigate the status of medicinal plants with emphasis on the challenges of its export. The methodology of this study is a review-library and the articles and websites of reputable journals are used and the views of your veterans in this field are expressed. The results indicate that due to the favorable climate of Iran, medicinal plants have not yet achieved their main position among farmers in terms of income generation. There are also no targeted and sustainable exports in this area. Therefore, considering that the commercialization of this field is obvious and necessary, in this study, suggestions have been presented to address the existing challenges.

Keywords: Medicinal plants, exports, world trade, comparative advantage.

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Phytochemistry of *Satureja khuzistanica* Jamzad essential oil cultivated in 3 provinces of Iran

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Abstract

Satureja khuzestanica Jamzad is a perennial plant from the ***Satureja*** genus and one of the exclusive native medicinal plants of Iran that is widely used in various pharmaceutical, food, cosmetic and health industries. Various factors such as habitat climate, altitude, soil type, amount and type of nutrition, irrigation, time and method of harvesting, drying and storage method, temperature and duration of drying and also the Essential oil extraction method has an effect on the quantity and quality of *S. khuzestanica* essential oil. In this article, different cultivated samples were collected from Alborz, Lorestan and Isfahan provinces and their essential oil was collected and analyzed according to standard conditions with GC and GC/MS instruments. Quantitative comparison of essential oil extracted from the aerial parts of *Satureja khuzestanica* in literature shows that the ecological conditions can affect the amount and type of essential oil components. However, the main compound in the essential oil of different geographical region is carvacrol (82.99 to 96.16%) and then compounds such as *p*-cymene (0.4 to 3.9%), γ-terpinene (0.3 to 3.8%) and β-bisabolone (0.2 to 1.5%) are in the next positions.

Keywords: *Satureja khuzestanica*, essential oil, carvacrol, *p*-cymene, γ-terpinene, β-bisabolone

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Evaluation of safflower *cultivation* in the lands of East Azarbaijan city of Osko

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Abstract

The lands along Lake Urmia have caused serious problems for farmers due to the drying of wells and high salinity. Even the cities on the shores of Lake Urmia have faced the problems of saline dust. One of the rotations that can be used as land cover to prevent the movement of fine dust and it also generates a decent income for farmers, safflower cultivation. This plant, which is one of the salt-loving plants, produces both the product and is used to supply the country with oil and meal.Due to the increase in water prices in the law on targeted subsidies, farmers now have to look for products that are grown with less water. To cultivate each kilogram of safflower in irrigated lands, 4,000 cubic meters per hectare of water is needed, which is less than the need for rapeseed and wheat fields. Improving modern irrigation efficiency, optimizing water consumption, making fundamental changes in irrigation methods and developing pressurized irrigation at the level of gardens and farms, to increase the productivity of production resources, is one of the best and most advanced methods possible. The importance of surface water control, canal dredging, artificial feeding, flood spreading and spring reconstruction is significantly effective in controlling surface water.Cultivation of safflower oil plant has recently increased in the country and in line with that, research on this oil plant is expanding based on obtaining high-yielding, oil-rich, thorn-free and cold-resistant cultivars.Safflower with favorable agronomic characteristics such as relative resistance to soil salinity and air dryness, high resistance to winter cold (autumn type), the presence of a favorable oil with more than 90% of unsaturated fatty acids, especially linoleic acid, has always been considered as a valuable oilseed.Referring to the effects of water depletion of Lake Urmia and remaining uncultivable lands, salinity of well water and reduction of soil quality due to regression of lake water, replacement of gardens and cultivation of plants resistant to salinity and water shortage, the proposed solutions to users along with developing culture It is considered as an optimal source of production.

Keywords: Safflower plant - Saline lands - Osko - East Azerbaijan

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Determination of the most utilization taken from Iranian green tea consumption using time infusion appropriated catechin releasing

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Abstract

Green tea (GT) contains important compound namely polyphenols having antioxidant properties. One of the most important polyphenols is catechin (C) to which many theraputical properties including anti-cancer; vascular -cardio protective have been attributed. In this study the maximum releasing of phenolic compounds in Iranian green tea related to the most utilization obtained from catechin within different infusion times was determined. Firstly, 5 g. of sample was weighted and 100 mil of hot water kept in 80 ºC was added to that and within the time infusion ranges from 3 to 72 min were assayed. Then the samples were filtered several times and using HPLC instrument was included with C18 column through water: acetonitrile: acetic acid (85:15:0.5 ml) and as isocratic separation at 275 nm were identified. The results showed the minimum and maximum amount of C in green tea infusions within the times of 3 and 72 min were equaled to 0.423 ± 0.095 and 1.23 ± 0.029 mg/g, respectively, based on GT dry weight. Since the releasing of C in GT, contrary to total phenol, will be increased from the time of 18 min and the more release get more protective properties; therefore, the most utilization form Iranian green tea will be within the time ranged from 18-72 min.

Keywords: Green tea, Polyphenol, Catechin, Protective properties, Utilization

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The effect of different solvents on total phenolic, flavonoid contents and antioxidant activity of Stem and flower organs of *Scrophularia striata*

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Abstract

Plants are rich sources of phenolic compounds which are important sources of antioxidants. Due to the antioxidant properties of *Scrophularia striata*, optimizing the extraction of phenolic compounds and antioxidant activity is important. The present study was conducted to investigate the effect of different solvents (ethanol 80%, methanol and water) on total phenolic, flavonoids content and antioxidant activities of Stem and flower organs of *Scrophularia striata*. Total phenolic and flavonoid contents were measured by Folin–Ciocalteu and Aluminum chloride methods, respectively. Antioxidant activity of extracts were determined by using Diphenyl Picryl hydrazyl (DPPH), Hydrogen peroxide (H2O2) and Ferric Reducing Antioxidant Power (FRAP) assays. The results were showed that the highest phenolic content was observed in flower methanol extract (18.6 mg gallic acid/g extract) and the least amount of phenol was extracted by stem water extract which was 1.3 mg/g extract. The highest flavonoid content was observed in stem methanol extract (5/56 mg quercitin/g extract).Flower methanol extract showed higher antioxidant activity than other extracts in two methods. Based on results of this research, Flower *of Scrophularia striata* can be suggested as useful source of natural antioxidants.

Keywords: phenol, Flavonoid, Antioxidant, *Scrophularia striata*

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Identification of new and targeted genes for the study of secondary metabolites in medicinal and aromatic plants

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Abstract

Medicinal and Aromatic Plants (MAPs) are an important source of secondary metabolites that are important for human health. Increasing the production and quality of this type of natural products through traditional methods such as the use of bioreactors or regeneration in laboratory conditions has always been an important challenge in the field of medicinal plants. However, advances in genetic research have greatly facilitated the study of the biosynthesis of secondary metabolites and a better understanding of the genes involved in these processes. This research has also identified and isolated genes involved in different stages of metabolic pathways. In addition, advances have been made in the development of applied genomic resources (EST databases and microarrays) in various species of medicinal plants, often providing new opportunities for advancing genotypes using markers or genetic transfer. This review article reviews recent advances in genetics and the identification of aromatic and medicinal plant genes for the study of secondary metabolites.

Keywords: Identification of genes, secondary metabolites, molecular markers, medicinal and aromatic plants.

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Effect of Air Parameters on Temperature Uniformity In Dryer Compartment Space,(Medicinal Plants And Agricultural Products)

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Abstract

Heat and the heating process are of the most widespread and the most important activities in the post-harvest operations for food products in the world. Such activities are usually expected to decrease the moisture content for crop preservation; the heating process is also used for modifying the mouth feel of a product in order to raise the food's market values. Likewise, recovery and storage of the energy, environmental protection alongside the climate effect are considered as notable issues. Nowadays different types of heating system such as the hot air heating machines are being used for heating the medicinal plants and agricultural products. Mostly, fossil fuel has been used by machines for this purpose, making the heat energy in the direct combustion. The heat from burning fuels is supplied directly by the airflow through the blower housing and harmful gases directed to enter the food chamber and the environment. , It must also kept in mind that in a direct in- line burner using natural gas, 3.5 lb. of water is add to the air for every cubic meter of natural gas consumed .

This action leaves undesirable and unintended effects on the product quality. Regarding these cases, such as non-constantity of the temperature in the compartment space of the products, lack of a precise temperature control, medicinal plants and agricultural products contamination through contact with invisible gases from the burning fuel, more pollution and other environmental issues are among the disadvantages of these types of machines. Currently, the same actions are being used in IRAN. Therefore, a new hot air heating system was required for heating the medicinal plants and agricultural products and its products having high capacity and satisfactory heating quality with no damage to the medicinal plants and agricultural products quality and the environment. Air distribution in the machine reservoir and the flow rate were calibrated to achieve good results and outcomes in the construction phase as well as in the procedural steps to create the machine. To conserve energy, a closed circuit system and series was added to the machine. In this research work first, the parts of the machine were designed using CATIA software then new heating system based on a hot water recirculation technique and effective air velocity has been fabricated.

An adjustable system was used to provide hot water with a high setting range of adjustment and high precision for different temperatures up to ninety degrees at the constant pressure. In order to avoid energy losses and prevent pollution of the environment A Newly Developed and Extra-Enclosed System was designed, fabricated and add to the machine. For this purpose two extra devices of heat exchanger mounted on the machine, one located at the blower fan inlet and other situated at the air outlet final channel of machine. Both energy saving heat exchangers have been connected by connecting series and insulated tubes.The new machine was tested in the Agricultural Process and Instrument Laboratory (APIL) of the Dryland Agricultural Research Institute, Kermanshah, Iran. The tests were performed based on the Randomized Complete Block Design (RCBD) experimental design was with three replications and the means were being compared using the Duncan's Multiple Range Test (DMRT). The parameters included the air temperature at three levels, the air velocity at three levels, and the hot air heting time duration at five levels. The data measured included the energy consumption, and the moisture content, of the agricultural products. Utilizing the data logger output and control volume testing on the machine indicated that 25% of the energy leaving the exhaust compartment of the machine has been returned to the product by using the extra system mounted on the machine. As a result, after having compared the machine treatments and the traditional experiments by considering the expenditure of the production and the product quality, the new technique with treatment of (air velocity: 2 m/s, air temperature: 70 °C and first hour of air heating time) has been presented as the best method in this research work.

Keywords: Air speed and temperature, efficiency evaluation, quality, marketability

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Analysis of volatile and soluble in water compounds of *Eryngium planum* L.

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Abstract

E. planum is an endangered species of the genus *Eryngium* from the genus Apiaceae. Many medicinal properties including anti-inflammatory, anti-diabetic, anti-oxidant and chronic pain treatment have been reported for this genus. At first, the seeds of this species were prepared and then planted in the greenhouse to produce seedlings. Aerial sampling was performed at full flowering stage in the second year after planting and dried in the shade. Sweat was taken from the samples and Using various methods as well as fractionation with different solvents (pentane, hexane, ethyl acetate, chloroform), water-soluble volatile compounds are prepared for analysis by gas chromatography. Part of the sample was prepared by rotary apparatus, another part by freeze-drying and part by solid phase extraction (SPE). The efficiencies (mg / 100ml) of different fractions and dried samples as follows:

Pentane (30.6), ethyl acetate (17.6), hexane (15.8), chloroform (7.3), solid phase extraction (SPE) (8/4), rotary (4.7) and freeze-drying (1.9) were obtained. In different fractionation methods, the maximum and minimum percentages of major compounds of *cis*-Chrysanthenyl acetate in ethyl acetate fraction (11.9) and to a very small extent in SPE method, β-Elemene in rotary method (11.5) and In the fraction of ethyl acetate (1.2), Germacrene A in the rotary method (4.9) and in fractionation with hexane and ethyl acetate (1), 14-hydroxy-(*Z*)-Caryophyllene in the SPE method (21/2) and was obtained in pentane fraction (2.8) and combination (*Z*)-Falcarinol in rotary method (12) and in fractionation with hexane and ethyl acetate (0.5) were obtained respectively.

Keywords: Floral water extraction, Fractionation, *E. planum*, Diabetes, Volatile compounds

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Investigation and Identification of chemical components of essential oil from *Laser trilobum* (L.) Borkh

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Abstract

Laser trilobum (L.) Borkh is a perennial herbaceous plant of the Apiaceae family, aromatic plant, this plant, known as Kefe cumin, horse caraway, gladich or three-lobed sermountain, grows in Iran.This plant is used as its extracts are recommended for the treatment of a wide range of diseases. To conduct this study, plant and seeds of *Laser trilobum* (L.) Borkh. were collected from Mazandaran province, Iran, therefore, the aim of the present study is to investigate chemical composition of its essential oil of *Laser trilobum* (L.) Borkh. The compositions of water distillated essential oils of *Laser trilobum* (L.) Borkh. Seeds and plant from Iran, essential oils were extracted by water distillation (Cleveanger type apparatus), essential oil yield was obtained from seed 2.28%, from plant 0.11%. For investigated of chemical components were using GC and GC/MS. The major constituents in the seeds were limonene (72.45%), perilla alcohol (22.01%) and α-bulnesene (1.07%). The major constituents of the plant are limonene (26.21%), perilla alcohol (24.96%) and caryophyllene oxide (5.31%). According to our investigation limonene have anti-inflammatory, antioxidant, anti-stress, and possibly disease-preventing properties properties and uses, and perillyl alcohol has shown some antitumor activity in laboratory and animal studies, but clinical trials in humans have shown no evidence of benefit, and have noted adverse side effects. perillyl alcohol is a metabolite of limonene, which itself is formed from geranyl pyrophosphate in the mevalonate pathway.

Keywords: Laser trilobum (L.) Borkh.m, Hydro-distillated, Essential oils

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Conventional Mechanical Devices for Separating Seeds of Medicinal Plants (Case study: Separation of Flaxseed and Plantain Grains)

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Abstract

Separating process is recognized as one of the important parts of seed processing technology for medicinal plants in order to achieve high quality seeds used for planting as well as seeds that are used directly for medicinal purposes. By using special tools and equipment for cleaning the seeds of medicinal plants, the marketability of these products will increase and will have more added values for these products. Nowadays, new methods are used to complete the separating operation and clean the seeds of medicinal plants. These methods, which are generally based on advances technologies in the field of electricity and computers, are used by expensive and relatively complex machines and devices. The purchase and operation of these devices is generally beyond the capacity of smallholder manufacturers of medicinal plants, and this has led to the marketing of some seed products of medicinal plants without proper separating. In this article, while looking at indigenous knowledge and conventional equipment for cleaning and threshing the seeds of medicinal plants, in particular, the use of fabric and respiratory separators for cleaning and separating flaxseed and plantain grains has been studied.

Keywords: Cleaning, Flaxseed, Medicinal Plants, Plantain Grains, Separators

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Determination cardinal temperatures and germination characteristics of *ATropa belladona* seeds

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Abstract

This research was conducted to determine the cardinal temperatures of *Atropa belladona* using regression models. Germination was carried out at constant temperatures of 5,10, 15, 20, 25, 30, 35,40 and 45 Celsius degrees in a completely randomized design with four replications. Germinated seeds were counted every twelve hours and then germination rate and germination percentage were determined and germination reaction was described based on beta, segmented and dent-like models. The effect of temperature on germination percentage and germination rate of seeds was significant. The highest germination rate was observed at 25 °C. Regarding the coefficients of explanation and square root of the mean square of error, segmented model was best fitted model for germination rate of black nightshade seeds. According to the results of this experiment, the minimum, optimal and maximum temperatures for *Atropa belladona* seed germination were 14.52, 25.90 and 39.84^{o}C, respectively.

Keywords: Cardinal temperatures, Germination rate, Segmented model.

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Application of UAVs in Agriculture: Advantages and Disadvantages

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Abstract

The growing population of the world leading us to an increase in nutrition Consumption. Considering that agriculture is the main factor in providing human food and is directly related to the volume of world resources; Progress towards Precision and sustainable agriculture is inevitable. Of course, it is not possible to enter this field without the use of modern methods, advanced and up-to-date machinery for the production of agricultural products. These machines must be able to maintain the quality and quantity of the product and make sure that they use least of natural resources and chemical inputs. UAVs can be introduced as one of these new machines that can be used to maintain sustainable agricultural goals. They are useful in two fields: monitoring and non-monitoring areas in all stages of production. Their simplicity and cheapness, recording of high quality and up-to-date images, and finally their high ability to diagnose plant health status have made UAVs a very good substitute to satellites and aircraft in the field of monitoring. On the other hand, reducing the damage to the environment during the operation, easy use in difficult areas and reducing the consumption of inputs due to their accurate and adequate usage, has also caused UAVs to enter the non-monitoring area and make them useful. In the present review article, after stating the history of using UAVs in agriculture, we have tried to point out the types of applications and finally the advantages and disadvantages of using them in agriculture.

Keywords: UAV, Remote Sensing, Precision Agriculture.

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Extension and development the village of Medicinal Plants steps toward rural sustainable entrepreneurship

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Abstract

Today, the cultivation of medicinal plants is considered as a comparative advantage in the multifunctional agricultural sector in the world. environmental considerations and green entrepreneurship with reduced risks of climate change and drought, quick profitability, women's employment and sustainable rural livelihoods are major issues in the medicinal plants village. In the agricultural sector, the farmer is the largest asset and factor of sustainable development and rural development. in the village of arbitration plants, development of new environmentally friendly businesses and empowerment of farmers in farm management, use of local technical knowledge, reconstruction of local innovations and zoning of rural areas in terms of rangeland plants, cultivation and domestication Important Medicinal plants are remarkable due to their ecological conditions. The present study uses a review and analytical method, while expressing the importance and necessity of rural entrepreneurship, the establishment of the village of medicinal plants and the importance of the role of the village of medicinal plants and agricultural tourism in sustainable rural development. According to the results, according to the level of farmers' participation in the processes of extension and development of the village of medicinal plants with the aim of empowerment, in rural areas due to the importance of multifunctional agriculture and local capacity of medicinal plants in It is suitable for rural development and reverse migration from urban to rural areas with the aim of rural sustainable development. It is suggested that the agricultural extension agency emphasize the participation of local villagers in the form of regular systems and social-rural networks and provide the basis for economic development and sustainable employment in the village of medicinal plants.

Keywords: Medicinal Plants Village, Green Entrepreneurship, Rural Entrepreneurship, Agricultural Tourism, Sustainable Development

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Antimicrobial properties of essential oils of medicinal plants

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Abstract

Essential oils are a mixture of volatile oily compounds that are made as a secondary metabolite in medicinal plants. Essential oils are not chemically homogeneous in composition, but are found in different compounds. They generally have a chemical group called terpenoids or terpene origin. Their chemical composition is very different based on factors such as plant, environment and extraction method. The present study provides a comprehensive summary of the definition of essential oil, the method of extraction from medicinal plants, biological and pharmacological activity, the study of chemical compounds as well as the potential benefits of essential oils to enhance community health.

Keywords: Essential oils, Chemical compounds, Medicinal plants.1242
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Phytochemical comparison of *Teucrium polium* ssp. *gnaphalodes* essential oil collected from Mazandaran and Kermanshah provinces

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Abstract

Aromatic or essential plants are a very important part of medicinal plants. Essential oils can be a good alternative in food and medicine due to their antimicrobial, antioxidant, anti-inflammatory and anti-cancer properties. Various factors such as habitat climate, altitude, soil type, amount and type of nutrition, irrigation, time and method of plant harvest, drying and storage method, temperature and duration of drying and essential oil extraction method effect on quantity and quality of plants essential oil. *Teucriun polium* is a perennial herbaceous plant of the Lamiaceae family. The aim of this study was to investigate the effect of habitat on the quantity and quality of essential oil of *T. polium* ssp. *gnaphalodes*. Accordingly, the flowering branch of *T. polium* ssp. *gnaphalodes* were collected from 2 provinces of the country and then essential oil was extracted. Essential oils were analyzed according to standard conditions with GC and GC / MS instruments. Quantitative comparison of essential oil extracted from aerial parts of *T. polium* ssp. *gnaphalodes* show that the ecological and climatic conditions of the habitat can affect the amount and type of essential oil compounds of this plant. Chemical analysis of essential oils of *T. polium* ssp. *gnaphalodes* show that the common compounds in the essential oils of this subspecies were valerianol (17.4 to 37.8%) and 7-epia-α-iodesmol (2.9 to 7.8%). Compounds such as β-pinene, limonene, E-caryophyllene and elemol were found in large quantities in one sample, while spathulenol, caryophyllene oxide, hexadecanoic acid and hexacosane were the other major compounds present in the other sample.

Keywords: *Teucriun polium*, *gnaphalodes*, essential oil, valerianol, 7-epia-α-iodesmol.

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Feasibility study of building a digital library of medicinal plants and traditional medicine for preservation and dissemination of intellectual properties of Iranian medicinal plants in the age of data governance

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Abstract

The present paper is the outcome of a continuous study on managing the data of medicinal plants in the last five years for studying the role of data management in preservation of intellectual properties of Iranian medicinal plants. Research approach was qualitative and the method was a kind of grounded theory. Sampling of was non-probable snow ball with selection of databases related to medicinal plants and their organizations and six interviewees with a focus group. Findings of the research show that collapse of the many websites and databases of medicinal plants was caused by increasing uncertainties with unawareness of their owners about scientific methods and localized models of digital libraries. At last, this paper recommend a protocol for building a new digital library based upon its qualitative findings and an accredited model of digital libraries critical success factors (CSFs) in Iran. Six CSFs are "good leadership and management practice", "having suitable change plan", "recruiting and safeguarding expert manpower", "selecting suitable DL software", "correct selection of digital objects", and "correct organization of digital objects". Comparison of the model with findings of this paper along with another model is represented in a table.

Keywords: digital library; medicinal plants, traditional medicine, traditional knowledge, Critical Success Factors (CSFs)

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Phytochemical profile by GC/MS and antioxidant properties of the extracts of some plants grown wild in Lorestan province

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Abstract

Phytochemical composition and antioxidant properties of Allium Jesdianum (AJ), Nasturtium Officinalis (NO), Eremurus Spectabilis (ES), Tragopogon Graminifolium (TG) and Falcaria Vulgaris (FV) which grow wild in the west of Iran were determined in this research. The free radical scavenging ability, total antioxidant capacity, phenol and flavonoid contents were measured using the 2, 2 diphenyl-1-picrylhdrazyl (DPPH), phosphomolybdate, Folin-Ciocalteu, and Zishen methods, respectively. The total antioxidant capacities of AJ, NO, ES, TG, and FV were 1.03±0.01, 1.39±0.09, 2.41±0.42, 0.79±0.08, and 1.20±0.13 (µmol ascorbic acid/gram of dry extract), respectively. Total flavonoid contents of AJ, NO, ES, TG, and FV were 21.55±1.22, 33.05±8.80, 18.32±2.30, 32.16±9.46 and 23.06±3.21 (mg quercetin/gram of dry extract), respectively. Total phenol content of the plant extracts ranged from 250.91 to 702.69 mg of gallic acid/gram of dry extract. The IC50 value was lowest (1654.75±857.56 µg/ml of extract) for NO and highest (8538.33±563.96 µg/ ml) for AJ. The contents of monoterpene hydrocarbons and aromatic compounds were highly correlated with IC50, with correlation coefficients of R= -0.85 and R= -0.97, respectively. The investigated traditional Iranian edible plants are rich in different types of chemical compounds and are good available sources of natural antioxidant compounds.

Keywords: Wild plants, Extract, Antioxidant properties, Phytochemical compounds

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Herbal creams as an anti-aging agent for the skin

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Abstract

Aging is a very common phenomenon for all living organisms, characterized by the gradual decline and degeneration of cells and organs. Cosmetics are used to protect the skin against harmful exogenous and endogenous factors and increase the beauty and attractiveness of the skin. Anti-aging cream reduces wrinkles and blemishes on the skin and acts to stimulate the regeneration of damaged skin cells, maintain skin moisture, stimulate collagen production to increase skin elasticity and become a source of antioxidants for skin tissue. Antioxidants can prevent the production of free radicals that are highly reactive. Herbal products have long been popular among people with minimal risk of side effects and maximum effectiveness. In this study, a review of the factors of skin aging and its prevention using herbal products has been done.

Keywords: Herbal cream, anti-aging agent, skin

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Increasing the effectiveness of oral consumption of curcumin with the help of nanosuspension method

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Abstract

Turmeric is a spice with long historical usage and wide range of therapeutic effects. Curcumin is an active ingredient of turmeric, shows various wonder health benefits including anti-inflammatory and antioxidant properties. Although curcumin has these potential properties, different barriers to use this substance are related to its low solubility in both acidic and neutral pHs and low bioavailability. To overcome these obstacles, different methods have been suggested, among them a nanoformulation is a promising approach. Curcumin nanoformulations have been more attracted to improve the water solubility and oral bioavailability in this regard. Nanosuspensions (NSs), have been prepared by solvent or non-solvent. Solvent free methods of high-pressure homogenization can improve the curcumin solubility by just 4.2 μg/mL in pure water. Ultrasonic homogenization has advantages and is more effective in making food-grade NSs because it is a fast process to make smaller solid dispersion. stabilizers are critical excipients to prepare highly stable NSs. Different edible stabilizers have been introduced in nanosuspensions as a surface-modified agent with diverse efficiency. However, surfactants are used frequently, but different kinds of biopolymers are nutritionally superior. Gum Arabic, β- lactoglobulin, carboxymethylcellulose sodium salt and soya lecithin are good example of stabilizers. D-α-Tocopherol polyethylene glycol succinate, is a water- soluble stabilizer and approved as GRAS. The Selection of an appropriate stabilizer can prevent agglomeration of curcumin nanocrystals. The results of this study indicate that the surface-coating of NSs by stabilizers may be used to improve the biodistribution of curcumin in different formulation.

Keywords: *Biopolymer, Curcumin, Suspension, Oral delivery*

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Stimulation of the Astaxanthin Apo-carotenoid biosynthesis in Spirulina microalgae

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Abstract

One of the secondary metabolites belonging to the terpenoid group is Astoxanthin ketocartinoid which is synthesized from the isopentyl diphosphate precursor that found in a wide range of higher and single-celled plants, including microalgae such as Spirulina. The effect of Potassium Di-hydrogen Phosphate on stimulation of Astaxanthin biosynthesis in Spirulina microalgae was investigated in a completely randomized design in four different treatments (0, 150, 250, and 350 mg /l), with three different replications. After extraction of cell extract containing Astaxanthin with DMSO solvents, the absorption results obtained by spectrophotometry were statistically analyzed by Genstat ver. 12 software and mean comparisons were grouped by the Duncan method at a probability level of 0.05% (P< 0.05%). The adsorption rates in per unit area, and in a constant volume of extract, were 1.88, 0.722, 0.556, and 0.537 for control treatments and the other treatments, respectively. No significant changes were observed in comparison with the control treatment, and with increasing the concentration of the treatment in the culture medium, the accumulation of Astaxanthin in the cellular contents of Spirulina was reduced. Improper application of the concentration of treatments has led to the deposition of solutes in the culture medium, which indirectly has a negative effect on the accumulation of Astaxanthin by reducing the growth of microalgae.

Keywords: Spirulina, Astaxanthin, Spectrophotometer, Keto-carotenoid

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Effect of Ultrasound and Sugar Priming on Germination and Phenol and Routine Content of Buckwheat seedling (Fagopyrum esculentum)

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Abstract

In order to investigate the effect of different sugar treatments and ultrasonic waves on some morphological and phytochemical characteristics of buckwheat (*F. esculentum*), a factorial experiment was conducted in a completely randomized design with three replications at Urmia University. Experimental factors include 2% glucose treatments (without sugar compound, glucose, sucrose, fructose, mannitol and maltodextrin) and ultrasonic waves at two levels of zero and ten minutes. The results showed that the main effects of sugar treatments on plant dry weight were significant. The highest fresh weight was in the control treatment without ultrasonic waves and the dry weight in the glucose treatment was without ultrasound waves, which were significantly different from the control treatment. The main and interaction effects of glucose treatments and ultrasonic waves were significant at both 1% and 5% levels of buckwheat germination percentage. The highest germination percentage is related to mannitol glucose treatment without ultrasound, which shows a significant difference with other glucose treatments as well as control treatments. Also, the interactions of glucose treatments and ultrasonic waves on the amount of routine at the level of one percent have been significant. According to the results, the highest amount of rutin is related to glucose treatment without ultrasound. Finally, the main effects of glucose treatments and ultrasonic waves on the amount of phenol were significant. The highest amount of phenol was observed in glucose treatment without ultrasound, which showed a significant difference compared to other treatments and control, as well as to treatments that were accompanied by ultrasound.

Keywords: Ultrasound, priming, routine, phenol, buckwheat

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Synthesis of Nanosorbents for Environmental pollution control of pesticide diazinon with activated carbon of *Pinus eldarica* fruit

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Abstract

In recent years, the use of activated carbon along with metal Nanocatalysts to remove pesticide residues from the environment has been noticed by researchers. The aim of this study was to remove Diazinon residues from water using Nanocomposites containing manganese dioxide nanoparticles. For this purpose, firstly the powdered residues of pine fruit were converted to activated carbon using phosphoric acid as an activator and by chemical-thermal method in normal atmosphere and then manganese dioxide nanoparticles were synthesized in its substrate. The chemical structure and carbon appearance of the resulting pine fruit and Nanocomposite were described by SEM and FTIR characterization methods. Adsorption tests were performed to evaluate the efficiency of Diazinon removal from aqueous solution by applying operational variables including pH (4-8), temperature (14-32°C), contact time (2-120 min) and at initial Diazinon concentrations (0.01-50 mg/L) was studied. The results showed that small amounts of Nanocomposite (1 mg/L) were able to remove 97% of the toxin with an initial concentration of 3mg/L. According to the results, the presence of manganese dioxide nanoparticles significantly improved the removal efficiency of Diazinon compared to activated carbon of pine fruit.

Keywords: Activated carbon, Diazinon, Nanocomposite, *Pinus eldarica*

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Investigating the challenges facing the development of Iran's medicinal plants sector in order to organize the trade of medicinal plants

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Abstract

In line with the policy of increasing non-oil exports, recognizing the country's products and production activities that have the necessary conditions to penetrate global markets, it seems necessary, the prospect of depletion of oil resources and the problems caused by the single-product economy, policies Has led to an increase in non-oil exports, including agricultural products. Export of medicinal plants is one of the rich sources of currency for our country. In Iran, most species of medicinal plants can be grown and produced. Considering the country's capabilities, it seems that Iran has not yet been able to make good use of existing capacities and potentials and find a suitable position in the field of trade in global markets for medicinal plants. Due to the importance of the issue, in this article, by reviewing strategies in the field of medicinal plants and herbal products based on the 1404 document, the international marketing strategies for the export of medicinal plants as well as the challenges facing the development of Iran's medicinal plants sector are discussed.

Keywords: Non-oil exports , medicinal plants , document 1404 , exports

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Investigating the main challenges in designing and manufacturing cumin harvesting machine

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Abstract

For a long time, there has been attention to traditional medicine and the use of medicinal plants in different cultures of the world, and Iran has a long history in this field. At present, the attention to medicinal plants and their products is increasing in the world and has a good global trade market. Iran is also one of the leading countries in terms of diversity of medicinal plant species due to its special climatic conditions. However, there are many problems in the medicinal plants industry in the country, the most important of which are the low level of mechanization in this area and the lack of many specialized machines required in all stages of planting, holding, harvesting and processing. In the meantime, one of the most important challenges, which also costs a lot for the producer, is the harvest stage of the plant. Cumin is one of the valuable plants that has been widely cultivated and in this respect Iran is ranked second in the world. However, so far, no cumin harvesting machine has been produced exclusively in the world. Accordingly, in this article, the challenges related to the design and construction of cumin harvesting machines in accordance with the local conditions of the country will be pointed out so that these points can be a good guide for designers and manufacturers of agricultural machines to step on this path.

Keywords: Cumin Harvester, Mechanization, Medicinal plants, Principle design

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The effect of selenium and methanol foliar application on yield and yield components of *Satureja hortensis* under salinity stress

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Abstract

This study was to investigate the effect of foliar application of selenium and methanol under salinity stress on safflower in 2019 in Islamic Azad University, Kermanshah Branch in a pot and factorial experiment in a randomized complete block design with four replications. Experimental treatments include three levels Salinity stress was 0 mM (control: irrigation with ordinary water), 30 and 60 mM and three levels of foliar spraying were control (distilled water), methanol and selenium. The effect of methanol foliar application on safflower height was significant and increased the height compared to the control. The results of comparison of the mean by Duncan method showed that selenium foliar application caused a significant increase in 1000-seed weight compared to the control. Also, in terms of biological yield, both methanol and selenium foliar application increased biological yield compared to the control, but the difference between the two foliar sprays was not significant. In general, the use of methanol foliar application under salinity stress is better than selenium foliar application.

Keywords: *Savory,* Selenium, Methanol, Salinity, Yield

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Effect of selenium and methanol foliar application on yield and yield components of basil (*Ocimum basilicum*) under salinity stress

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Abstract

This study was to investigate the effect of foliar application of selenium and methanol under salinity stress on basil in 1998 in Islamic Azad University, Kermanshah Branch in a pot and factorial experiment in a randomized complete block design with four replications. Experimental treatments include three levels Salinity stress was 0 mM (control: irrigation with normal water), 30 and 60 mM and three levels of foliar spraying were control (distilled water), methanol and selenium. According to the results of this study, basil is resistant to salinity stress at the level of 30 mM, but at the level of 60 mM, it faces reduced growth and biological yield. The effect of selenium foliar application on the improvement of important performance-related traits is more important than methanol foliar application. The results show a positive and very significant correlation between biological yield and root dry weight. Also, biological yield has a positive and very significant correlation with plant height and 1000-seed weight.

Keywords: Basil, Salinity, Methanol, Selenium, Yield

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Evaluation of ecological characteristics of the habitat on amount of minerals in the medicinal plant *Hymenocarter longiflorus* Benth in rangeland of South Khorasan province

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Abstract

Medicinal plants in the field of natural resources are considered as one of the most important strategies in the field of health, trade and technology. Scientific and comprehensive knowledge of the elements and components of rangeland ecosystems is essential for their proper planning and management. For this purpose, the ecological characteristics of the habitat and amount of some minerals of *H. longiflorus* Benth medicinal plant in the rangeland ecosystems of South Khorasan in two habitats of Amroodkan Ferdows Valley and Sabz Sarayan Valley were studied. Thus, 3 transects were established in the representative area of each habitat and 10 plots of 3 square meters were installed along each transect. In each plot, climatic and topographic characteristics of each habitat and physical and chemical factors of the soil were measured. The results showed that the direction of both habitats was north and Amrudkan valley had higher altitude and average annual rainfall compared to Sabzerood. The soil of both regions was in the acidic range and the soil texture in the habitat of Amrudkan valley was loam and in Sabzrood habitat was sandy-loamy. The habitat of Sabzrood was Sarayan. Also, there was a significant difference between the minerals in the medicinal organ of *H. longiflorus* Benth in the two habitats and the minerals in the flowering branches of this species were higher in the Emroodkan valley habitat than Sabzrood habitat . In general, the results show the influence of phytochemical characteristics of this species. Due to its medicinal value, having minerals and also high resistance of this plant to different environmental conditions, its use in urban green space belt is recommended.

Keywords: : Soil, Climatic factors, Minerals

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Selection of Iranian fenugreek (*Trigonella foenum-graecum* L.) landraces for winter sowing date

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Abstract

Autumn cultivation improves the yield of plants compared to their spring cultivation, but the main problem in autumn cultivation is the damages of cold stress on plant growth. To evaluate the effect of cold on the Iranian fenugreek (Trigonella foenum-graceum L) landraces, an experiment was performed in field conditions at Ferdowsi University of Mashhad, Iran. The field experiment was conducted during the 2013-2014 growing seasons. So that in 2013-2014 ten fenugreek landraces (Azari, Ardestan, Tall, Dwarf, Shiraz, Shirvan, Mashhad, Neyshabur, Hamedan, Hendi) were sowed in five sowing dates (September 14, October 15, November 14 in 2013 and March 6, April 4 in 2014). The results showed that the effect of sowing date*landrace was significant on survival rate, height, and grain yield. Delay in cultivation from September to November increased the survival percentage of the most landraces, however, the Neyshabour landrace had a survival of 100% in all sowing dates. Delays in sowing from September to April reduced height, branch number, grain yield, and HI of all landraces, however, the reduction was not the same in all landraces. So that, the highest and lowest percentage of yield reduction as a result of sowing delay from September to April, belonged to Mashhad (55%) and Shirvan (44%) landraces respectively. Mashhad, Neyshabour, and Shirvan landraces had the highest grain yield. The best sowing date for these landraces to gain more grain yield was September. While the best sowing date to give the highest grain yield of other landraces was November.

Keywords: Cold acclimation, Grain yield, Survival percentage

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Evaluation of the effects of auxin and amino acid on vegetative and reproductive traits of Lemongrass medicinal plant (*Melissa officinalis* L.)

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Abstract

In order to investigate the effects of auxin and amino acid on vegetative and reproductive traits of lemongrass, a factorial experiment was conducted in a completely randomized design in the greenhouse of Birjand Faculty of Agriculture. Factors included auxin (zero, 50, and 100 ppm) and amino acid (zero, 1.5, and 3 per thousand) with three replications. The results showed that auxin had a significant effect on vegetative traits (fresh and dry plant weight and the number of leaves), reproductive traits (flowering stem height), and photosynthetic pigments (chlorophyll a). Amino acids also affected vegetative traits (height, fresh and dry weight of plants, and number of leaves), reproductive traits (number of flowers and height), and photosynthetic pigments (chlorophyll a and total chlorophyll), so that the highest height and number of flowers with the application of 3 per thousand amino acids and total chlorophyll were obtained from the treatment of 1.5 per thousand amino acids. Interactions showed that different levels of auxin and amino acids had a significant effect on vegetative traits (height, fresh and dry weight of plants, and number of leaves), reproductive traits (number of flowers and height), and photosynthetic pigments (chlorophyll a, total chlorophyll and carotenoids). The highest dry weight of the plant was 0.74 g as a result of 100 ppm auxin and 1.5 per thousand amino acids and 1.42 mg. g^{-1} of 50 ppm auxin and 1.5 per thousand amino acid was obtained. Based on the results, auxin and amino acids can be considered effective in increasing the functionality and growth characteristics of lemongrass in this experiment.

Keywords: auxin, yield, lemon balm, spraying
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Evaluation of the effect of gibberellic acid and amino acid application on morphological and biochemical properties of fenugreek medicinal plant (*Trigonella foenum- graecum* L.)

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Abstract

In order to investigate the effects of gibberellic acid and amino acid on the quantitative and qualitative traits of fenugreek, a factorial experiment was conducted in a completely randomized design in the greenhouse of Birjand Faculty of Agriculture. Experimental treatments included gibberellic acid (zero, 100, 250 and 500 ppm) and amino acid (zero, 1.5 and 3 per thousand). The results showed that the highest height, fresh and dry weight of the plant (34.50 cm, 1.92, and 0.30 g, respectively) were observed in the treatment of 500 ppm gibberellic acid, also the highest total chlorophyll content, a, b and carotenoids (respectively, 12.96, 8.58, 4.38, and 0.508 mg. g^{-1}) in gibberellic acid treatment (500 ppm) and the lowest amount of these traits (respectively , 9.18, 6.91, 2.27 and 0.265 mg. g^{-1}) were obtained in the control. The results showed that the highest amount of phenol (62.90 mg. g^{-1}) was obtained in the treatment of 500 ppm of gibberellic acid. Amino acids also had a significant effect on vegetative traits (plant dry weight, leaf fresh weight, and internode distance), biochemical traits (antioxidant activity, anthocyanins, and flavonoids). The results showed that the highest amount of antioxidants with 54.94% was obtained in treatment 3 per thousand amino acids. Treatment 3 per thousand amino acids caused an increase of 17.26 and 17.76% of anthocyanins and flavonoids compared to the control, respectively. The highest fresh weight (2.20 g) was obtained in the treatment of 500 ppm gibberellic acid and three per thousand amino acids. Based on the results, the treatment of 500 ppm of gibberellic acid and 3 per thousand amino acids can be considered effective in increasing the morphological and biochemical properties of fenugreek.

Keywords: Bio fertilizer, Gibberellin, Pigmentation, Reproductive Growth, Secondary Metabolite

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Evaluation of the effects of amino acids and zinc on vegetative traits and yield of savory medicinal plant (*Satureja hortensis* L.)

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Abstract

The effects of applications of amino acids and Zn on vegetative characteristics of savory, a factorial experiment was conducted in the greenhouse of the college of Agriculture, Birjand University, Iran, during the cropping year 2016, in a completely randomized design. Factors consisted of amino acids at three levels (0, 1, and 2 per thousand) and zinc at three levels (0, 2, and 4 per thousand) with three replications. The traits include vegetative traits (height, fresh and dry weight of the plant, number of leaves, and number of nodes, internode distance, number, and length of lateral branch). The results showed that amino acid had a significant effect on vegetative traits (height, fresh and dry weight, leaf number, internally spacing, and lateral branch length), with the highest leaf number (36.83 per plant) and fresh weight of plant (1.43 g) was obtained from the 2 per thousand treatment. Zinc also affected vegetative traits (height, fresh and dry weight of the plant, and the number of leaves and internodes), so that the highest height (27.45 cm) was obtained from treatment 2 per thousand zinc. Interaction effects showed that different levels of amino acids and zinc had a significant effect on vegetative traits (height, fresh and dry weight of the plant, leaf number, and lateral branch length), the highest dry weight of the plant was 0.38 g The treatment was carried out at 2 per thousand of amino acids and 2 per thousand Zinc. Based on the results, it is possible amino acids and zinc can be effective in increasing the functionality and growth characteristics of savory.

Keywords: Amino acid, Savory, Spraying, Zinc

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Design and synthesis of 5-methoxy-2-methyl-H1-indole derivatives containing aryl acetohydrazide substitution as potential cyclooxygenase inhibitors

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Abstract

The molecular mechanism of aspirin and other NSAIDs was first discovered in the 1970s and it was found that these drugs exert their anti-inflammatory effect by inhibiting the enzyme cyclooxygenase (COX). The cyclooxygenase enzyme catalyzes the synthesis of PGG2 from arachidonic acid and its conversion to PGH2, which is the precursor of all prostanoids. Hydrogen bonding is essential for the inhibitory effect of cyclooxygenase. The methoxy group has a dual effect in the meta and para position. Placement of this group in the lateral metaphenyl content has led to a further reduction of the effect compared to the para position, which indicates the spatial constraint of the substitution in the meta position. Indomethacin is a potent, time-dependent, non-selective inhibitor of the cyclooxygenase enzymes COX-1 and COX-2. Deletion of the 2'-methyl indomethacin group produces a weak and reversible COX inhibitor, leading us to discover function in that position. Replacement of the 2'-methyl indomethacin group with trifluoromethyl CF3-indomethacin produces a potent inhibitor with kinetic properties similar to indomethacin.

Keywords: Cyclooxygenase enzyme, Non-steroidal anti-inflammatory drugs, Synthesis, Anti-inflammatory

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Design and synthesis of 5-methoxy-2-methyl-H1-indole derivatives containing aryl acetohydrazide substitution as potential cyclooxygenase inhibitors

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Abstract

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Keywords: Cyclooxygenase enzyme, Non-steroidal anti-inflammatory drugs, Synthesis, Anti-inflammatory

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Economics and trade of medicinal plants in the world and Iran and the challenges ahead

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Abstract

The growing use of medicinal plants and their products has enhanced the role of these plants in the global economic cycle. Support for the herbal and herbal medicine industry is not limited to financial support, although this is one of the basic strategies for the development of this industry. The method used in this research is descriptive. The method used in this research is descriptive. This means that in the descriptive method, without the intervention or mental inference of the researcher, the current state of the economy, trade and export of medicinal plants and the obstacles to the existing problems have been studied. According to studies, there is currently no major problem in production. Rather, the main problem should be sought in the market of these products. Weaknesses in this issue include weaknesses in extension and advertising, branding, packaging negligence, selling raw materials and unknown products and marketing. The use of scientific and correct methods in all stages of production and industrial and economic use of medicinal plants can lead to the production of products in a healthy and desirable way and increase Iran's share in global markets. Economic marketing operations for agricultural products should include steps such as market needs assessment and, if necessary, promotion, scientific and financial advice, purchase guarantee, crop storage, processing and transportation. So that the real producer with more income and the final consumer with a lower price establish a stable relationship with each other and a stable market is formed for these products.

Keywords: Economic importance, Medicinal plants, Challenges

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Use of medicinal plants in oral health and dentistry

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Abstract

Tooth decay and gum diseases are among the most common diseases. These problems not only impose a very high cost on society, but also lead to disabilities in this part of the body. Maintaining and promoting oral health is one of the programs that should have a special place in life. Different plants have the properties expected to achieve this. The use of these natural ingredients can be more welcomed.Tooth decay is the most common oral problem that results in pain, the need for restorative or endodontic treatment, tooth loss, or extraction. Gum disease can also lead to loss of gums, jaw bones and teeth. Various diseases, such as thrush, herpes, aphthous, and inflammation of the mucous membranes, also irritate the soft tissues of the mouth. Halitosis (bad breath) reduces the level of interpersonal communication. Dry mouth is another problem that predisposes the mouth to soft tissue diseases and caries.Some herbs like Thyme (Thymus vulgaris), Chamomile (Matricaria chamomilla), Mint (Mentha) and Teucrium polium (Teucrium polium) have antimicrobial (antibacterial, antiviral and antifungal) effects. Some herbs, such as black pepper, purslane, black Spanish radish, and pomegranate, strengthen the gums. Other herbs, such as basil (Ocimum basilicum), Plantago ovata, and coriander, also affect soft tissue health. Rosemary, thyme (thymus vulgaris), watercress (Garden cress), and parsley (Parsley) can be used to eliminate bad breath. Dry mouth can also be treated with herbs such as licorice and pear.

Keywords: Herbal plant, medicinal plant, dentistry, oral health, life style.
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Importance of *Galega officinalis* seeds in controlling diabetes

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Abstract

Diabetes is one of the most common diseases and its special symptom is high blood sugar above 120 mg/dl in fasting state and other symptoms include overeating and binge drinking. The cause of diabetes has been reported to be a decrease in insulin production in the body or a decrease in the effect of insulin on sugar metabolism. Diabetes develops when the hormone insulin, also known as a regulator of blood sugar, is disrupted. This condition causes the metabolism to not work normally and the blood sugar to be higher than normal. From the modified seed leaves of the Galga plant, the Galga plant tablet is obtained. Its chemical composition includes saponins, flavonoids and guanidine and alkaloid derivatives. People with diabetes can use this herbal pill that lowers blood sugar. The hypoglycemic property of this plant is due to the presence of guanidines in its leaves, which has been used as a model for the synthesis of hypoglycemic bisaccharides such as metformin. This plant reduces blood sugar by preventing the absorption of sugar in the intestine. The compounds in Galga herbal pills strengthen the effect of insulin in the body and increase blood sugar in the body by increasing the entry of sugar into the cells.

Keywords: Blood sugar, Diabetes, Galga, Insulin
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Investigation of Harmine and Harmalin Alkaloids in Seganum Peganum harmala L. Seed Using Fluorimeter Technique

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Abstract

Peganum harmala L. is a local herb of the Nitrariaceae family found in Central Asia, the Middle East and North Africa. (1 and 2) Harmine and harmalin is an active drug secondary metabolite produced by Peganum harmala. (3) which has anti-tumor effects, vasodilator effects, anti-HIV, antioxidant activity, immune system modulating properties and hypoglycemic effects.

In this study, 20 g of pecan seeds ground in 30% (v / v) acetic acid solution were mixed for 10 minutes and mixed well. The mixture was passed through 0.45 nm filter paper. Washed again with acetic acid. Then petroleum ether and ethyl acetate were added in 100 ml and brought to pH = 8. Finally, chloroform was added to the above solution. The obtained alkaloids were collected in the chloroform phase after evaporation. (2), and was studied using fluorimetric technique to detect harmin and harmalins in Pecan seed extract for purification and its use as an effective substance for the expression of genes involved in HCT-116 cancer cells. The results obtained in the readings in the wavelength range of 376 to 478 nm showed that the extraction method with chloroform overlaps with about 90% of the standard material and can be used for loading on nano-graphene in future studies. Use the contract.

Keywords*: Peganum harmala L,* Fluorimetric technique, Purification
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Evaluation of beta-carbonyl active substance in Peganum harmala plant using Transform Infra-Red Spectroscopy technique(FTIR)

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Abstract

Peganum harmala L is a perennial herbaceous plant that is very important in the herbal medicine industry. Which is used in medicine and health (1) In this study, using FTIR as a method to determine the functional groups of the active ingredients of Peganum harmala L has been investigated. In this study, 20 g of Pecan seed was well stirred for 10 minutes after grinding in 30% (v / v) acetic acid solution. The mixture was passed through 0.45 nm filter paper. And washed again with acetic acid. And petroleum ether and ethyl acetate were added 100 ml each. Then it was brought to pH = 8. Finally, chloroform was added to the above solution.The obtained alkaloids were collected in the chloroform phase after evaporation. (2) The use of FTIR to detect harmins and harmalins in Pecan seed extract for purification and its use as an effective substance for the expression of genes involved in HCT-116 cancer cells were studied. Transform Infra-Red Spectroscopy frequency region of 4000 – 400 cm-1. The spectrum of P. harmala extract was in accordance with harmine and harmaline standards and the absorptions of P. harmala extract at different wave lengths, 1072, 1237, 1455, 1624 and 3072 refers to different functional groups (C-H), (C=O), (C=N), (OCH3) and (C-N), respectively. This is a great overlap of these functional groups in the range between 4000-400 cm-1, which is confirmed by the high purity of the extraction. The expression of genes involved in HCT-116 cancer cells was studied.

Keywords: Peganum harmala L., Transform Infra-Red Spectroscopy, Purification
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Identification of Harmine, Harmalin Alkaloid in Espand Medicinal Plant Extract Peganum harmala L by liquid phase chromatography (HPLC)

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Abstract

Peganum harmala L. has long been used for medicinal purposes due to the presence of the effective substance harmin harmalin It has been used, among other things, to relieve pain and to treat high blood pressure, Parkinson's disease, as a messenger Stimulus is used. Recently, research on herbal medicines and chemical clarification in cancer treatment has increased has found. A combination of chemicals with conventional approaches to cancer treatment can promote cell death through inhibiting cell proliferation and invasion, sensitizing cancer cells and boosting the immune system improve the results. In this study, 10 g of pecan seeds ground in 30% (v / v) acetic acid solution and mixed for 10 minutes were well stirred. And washed again with acetic acid. And petroleum ether and ethyl acetate were added at 50 ml. Then it was brought to pH = 8. Finally, chloroform was added to the above solution. The obtained alkaloids were collected in the chloroform phase after evaporation. (2) The use of HPLC technique to identify the harmin substance and harmalins in Pecan seed extract for purification and its use as an effective substance for the expression of genes involved in HCT116 cancer cells were studied. The results obtained from HPLC analysis to isolate the components P. hamrala extract was used and the results were compared with standard solutions of harmin and harmalin. The chromatograms confirmed the presence of harmin and harmalin as their residence time of 8.07 and 5.32 minutes, respectively, which was in accordance with the standard solution.

Keywords: HPLC, Peganum harmala L., Purification, Harmine, Harmalin
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