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Book of Abstracts
Rosa damascena 2019



Book of Abstracts

Rosa damascena 2019

The second International Conference & Workshops on *Rosa damascena*
13-15 November 2019, University of Kashan, Qamsar, Iran



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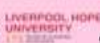
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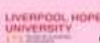


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Posters



Effect of Indol-3-Butyric acid and Naphthalene Acetic acid on Rooting of Cuttings of *Rosa damascena* Mill.

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Abstract

Introduction: The study reports results on the effect of Indole Butyric Acid (IBA) and Naphthalene Acetic Acid (NAA) on Rooting of Cuttings of (*Rosa damascena* Mill.), an experiment was carried out in 2017 at the Islamic Azad university of Khoy, Iran.

Methods: This experiment was arranged as factorial, based on Randomized Complete Block (RCB) design with four replications. Treatments were with IBA (0, 1000, 2000, 3000, 4000 and 5000 mg l⁻¹) and NAA (0, 1000, 2000, 3000, 4000 and 5000 mg l⁻¹). The cuttings were harvested under fog system. The percentage and number of root of the cuttings were evaluated after 70 days.

Results: The effect of different concentration of auxin on all studied traits was significant at 1% level. IBA in higher concentrations and NAA in lower concentrations, increased the rooting of cuttings). In NAA, with increasing of concentration to more than 2000 mg l⁻¹, growth was reduced compared with control. The highest percentage of rooting observed after treatment with 1000 mg l⁻¹ NAA (84%) and 5000 mg l⁻¹ IBA (66%) treatment.

Discussion: The results of evaluation of quality traits of cuttings (number of root, root diameter and length of root, fresh and dry weight of the formed roots, length of the formed shoot, fresh and dry weight of the formed shoots and leaves) showed that the best rooting and root system was related to 5000 mg l⁻¹ IBA treatment.

Keywords: Damask rose, percentage of rooting, IBA, NAA

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Comparing the Essential oil Components of *Rosa damascena* Mill from Three Natural Habitats of the Suburbs of Kashan

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Abstract

Introduction: *Rosa damascena* Mill is one of the important Rose species for production of aromatic compounds. The oil and distilled water of Rose are used vastly in medicinal, hygienic-cosmetic and food industries. Due to its adaptation to different climatic conditions, this plant species has spread in many parts of the world and Iran. In this research, chemical composition of three *Rosadamascena* Mill samples from natural habitat of Kashan were examined.

Methods: The aromatic compounds were obtained by SDE method. In this method, 100g of fresh *Rosadamascena* Mill petals with water was heated for 4 hours, the solvent used in essential oil extraction was hexane. The yields of essential oils from 3 different habitats (Barzok, Kamoo and Qamsar) were calculated. The essential oils were analyzed by GC and GC/MS.

Results: The result showed there is no significant difference between essential oil yields at 3 different habitats. Samples from Barzok had higher percentage of citronellol and sometimes geraniol, but the valuable compound, phenyl ethyl alcohol, was not found in the essential oils or exist in very little amount. In Qamsar's samples, the percentage of phenyl ethyl alcohol was considerably high and citronellol and also geraniol was found in the essential oil, of course in lower amounts. Also, there were some differences between the minor components.

Discussion: Considering the essential oil yield and the compounds in the essential oil, it is concluded that *Rosa damascena* in Qamsar region has more essential yield, although there was no significant difference in essential oil yield. Also, there was a slight difference in the types of compounds, that often related to habitat conditions. Sefidkon et al. (2004) for *Rosa damascena* samples collected from Kashan, Oskuo and Chalus, found a similar result that is consistent with the present study. Since the samples studied in this research had slight differences in composition, therefore, for definitive conclusions, it is necessary to examine more samples with rigorous statistical tests.

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Comparing the Essential oil Components of *Rosa damascena* Mill. in the Several Extraction Methods

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Abstract

Introduction: *Rosa damascena* Mill is one of the important Rose species for production of aromatic compounds. The genus *Rosa* consists of more than 200 species. Among these *Rosa damascena* Mill (a.k.a. “the oil rose”) belongs to the Damask group of roses which are known for their strong fragrance. *R. damascena* has been cultivated as garden rose in some west European collections but it is mainly grown for production of rose oil and rose water obtained after steam distillation of the rose flowers. It is considered that the oil rose originates from ancient Persia (today Iran) and has been later spread to Europe and Northern Africa. In this research, essential oil chemical composition of *Rosa damascena* obtained by three Extraction Methods were compared.

Methods: In this research the essential of *Rosa damascena* Mill. extracted by three different (SDE, Clevenger and industrial extraction) methods. Then, essential oils were analyzed by GC and GC/MS, and finally the yield of essential oil and essential oil composition from these three methods were compared. For all three methods, samples were taken from Qamsar region. The Clevenger and SDE apparatus was manufactured by Ashke Shishe Company of Tehran and the industrial extraction of essential oils was carried out at Ashke Rose Company.

Results: The result showed there is a significant difference between essential oil yields. The essential oil obtained from SDE had showed the more performance. The main of essential oil components were observed in all samples, although the valuable compound, phenyl ethyl alcohol, found in the essential oils by SED method, was slightly higher than of the other methods, but in the geraniol component, there were no significant differences in all three methods.

Discussion: The amount and composition of the rose oil distilled from the rose petals is strongly affected by the genotype of the cultivated Damask rose, the climatic conditions, the time of rose petals harvesting, and the technology used for processing and distillation. Although laboratory methods are not comparable in terms of performance to industrial methods, they can be used as an introduction to industrial machinery. Therefore, it is suggested to compare the essential oil yield in different extraction methods at different time intervals.

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Determination of Quantitative and Qualitative Yield of *Rosa damascena* Mill. Superior Genotypes In two climatic regions of Semnan provinc

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Abstract

This experiment was conducted in a randomized complete block design with three replications in two regions (Shahmirzad, Semnan) in Semnan province during 2013-96. There was a significant difference ($\alpha = 1\%$) between flower and accessions. The amount of this parameter in Semnan and Shahmirzad was 1993/25 and 1834.77 kg / ha, respectively. Access Fars 1 had the highest amount of fresh flower production at 2688.94 kg / ha. Isfahan 5, Isfahan 9, Khorasan 3 and Khorasan 2 accessions produced fresh flower with 1922 530/1833, 1833/98, 1776/40 and 1922/1948 respectively. Quantitative examination of experimental accessions showed generally Isfahan 9 and Isfahan 5 had the highest amount of essential oil in both experimental areas. In the qualitative study of the essential oils of the studied oxidations after mass spectrometry (GC / MAS) samples in the laboratory of Forest Research Institute, the highest level of citronellol in accession of South Khorasan 3 from Semnan region and the highest amount of geraniol in accession of Isfahan 9 in Shahmirzad area.

Results and Discussion: More flower performance Results of analysis of variance showed significant differences ($\alpha = 1\%$) between regions. Semnan region with average fresh flower weight of 25.13 kg was in the superior statistical group and Shahmirzad area with average of 1834.74 kg of Tergel was in the other statistical group (Figure 1). Comparisons of means showed that accessions were significantly different in terms of this trait ($\alpha = 1\%$ (in terms of total fresh weight of flower Fars 1 with fresh weight in flower 2694/94/88). Isfahan number 5, Isfahan 9, South Khorasan 3 and Khorasan 2, with mean fresh flower weight of 530/1922/98, 1833/98, 40/76/76 and 23/1348 kg were in the other statistical groups, respectively.

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Effect of *Rosa damascena* freezing on Time and Efficiency of Distillation Process

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Introduction: The process of extracting rose water and essential oil from *Rosa Damascena* begins when *R.Damascena* ripeness. Large volumes of *R.Damascena* are harvested in about three weeks in each area. Distillation operations should be carried out immediately after harvest, so that the aromatic compounds of the flower are not reduced and the flowers do not rot. So the duration time of the *R.Damascena* distillation process is very important. The purpose of this paper is to investigate the effect of *R.Damascena* petals freezing on the duration time and efficiency of the *R.Damascena* Distillation Process.

Methods: The *R.Damascena* flowers were obtained from the Noshabad area of Kashan. Part of the flowers was frozen at -18°C for 24 hours. The distillation process was performed in two conditions for fresh and frozen flowers by the Clevenger apparatus and the essential oil content was measured at different times.

Results: The results showed that in the case of the frozen flower, the distillation time was reduced by 50% and the efficiency of the operation increased Compared to the condition of fresh flowers.

Discussion: Reducing the distillation time and increasing its efficiency can be attributed to the freezing of water within the flower tissues, which breaks them down and releases the essential oil more easily. On the other hand, freezing *R.Damascena* flowers allow them to be stored to use them at an arbitrary time.

Keywords: *R.Damascena*, *R.Damascena* freezing, essential oil, distillation, rose water, Efficiency of Distillation, time of Distillation

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***In vitro* propagation of *Rosa damascena* Mill. in different level of PGR and medium culture**

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Introduction: Roses are an important commercial crop existing in a wide range of varieties in the world. Tissue culture technique is becoming an important method for massive production of stocks for this commercial plant species. It makes possible producing large numbers of plants within a small physical space and in a short period of time. Among roses there is no report on *in vitro* propagation in *R. gallica* but information is available for *R. damascena*. We performed a parallel study on different stages of micro propagation of damask rose.

Methods: Nodal segments taken from actively greenhouse-grown *R. damascena* cvs. Kashan and Kazanlik and *R. gallica* cv. Tuscany superb were used as the source of explant. For each stage of the micro propagation procedure (i.e., explant establishment, shoot multiplication and growth, and rooting), different media and combinations of plant growth regulators were utilized.

Results: A new culture medium with modified Murashige and Skoog medium NH₄NO₃ and KNO₃ concentrations resulted in significant improvements to shoot proliferation. The results obviously showed that liquid medium affected differently on proliferation depending on rose cultivars. Effect of plant growth regulators was also different on proliferation depending on cultivar. Rooting was different depending on rose cultivar, as well. Jiffy peats containing liquid medium were used for efficient and large scale induction of roots in proliferated shoots.

Discussion: In conclusion, a practical economical, simple and efficient protocol has been developed for micro propagation of both *R. damascena* and *R. gallica* using liquid and agar gelled culture media. Importantly, a comparative analysis of *in vitro* performance of *R. damascena* and *R. gallica* indicates that efficiency of *in vitro* multiplication technique is strongly genotype dependent, allowing the selection of genotypes with high performance. We developed an efficient and cost-effective method for rapid and high-quality shoot multiplication and *in vitro* rooting of Damask rose using nodal explants.

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Salicylic acid reduces biochemical damage by salinity stress in *Rosa damascena* Mill.

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Introduction: *Rosa damascena* Mill. is one of the most important plants from Rosaceae family, with a long historical use in the traditional medicine and as a valuable oil bearing plant. The rose scent derived as oil, concrete or absolute. Soil salinity is a major constraint to common economic crops in many arid and semi-arid regions of the world, which affects plants through osmotic, specific ion and oxidative stresses (Pitman and Läuchli, 2002). Salt stress could affect plant growth in different ways, such as decreasing water uptake, accumulating ions to toxic levels, and reducing nutrient availability (Tunc, türket *al.*, 2011). Salicylic acid (SA) is a signaling molecule known to participate in defense responses against a variety of environmental stresses including salinity.

Methods: In this research, the effect of salinity stress on Kashan genotype of Damask rose was assessed in a factorial trial based on a completely randomized design, with four replications per treatment. Treatments included four levels of salinity (4, 8, and 12 ds m⁻¹) and salicylic acid spray (0 as control, 0.5, 1, and 2 mM). Some biochemical characters such as Proline, Phenol, Anti-oxidant activity and Malondialdehyde were calculated.

Results: The results showed that with increasing the level of salinity, total phenol content and proline were increased also antioxidant activity increase by higher salinity stress. Result of application of SA showed that by using SA antioxidant activity, proline and phenol content were increased. Furthermore, salicylic acid at 0.5 mM supported the highest anti-oxidant defense mechanism. Malondialdehyde was summation by high level of salinity; however SA can reduce content of Malondialdehyde in salinity stress.

Discussion: According to results, salicylic acid at 0.5 mM improved the defense mechanism of plant. Plants when receive stress, show reaction by product proline, phenol and antioxidant compounds. Salinity stress increased ion leakage, then Malondialdehyde summation in plant. By using SA damage of stress decreased and plant can reduce harmful compound in their cells.

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Industry and economics of *Rosa damascena* Mill. in Turkey

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Introduction: Turkey is a country situated in Western Asia (97%) and the Balkans (3%). Turkey's total area is **783 thousand** square kilometers and its population is **82 million**. Because of Turkey's location and climate, many medical and aromatic plants are cultivated or obtained from the wild and many of these are specifically cultivated organically. There are about **9500** species of flowering plants in Turkey that **3000** of them are native to the country (1).

The most important world rose oil producers are Turkey and Bulgaria. For **over 100 years**, roses have mainly been grown in Turkey in Isparta province that is located in the Lake Region of Turkey (West Mediterranean Region). Roses are also grown in some other parts of Turkey such as Afyon, Burdur and Denizli district (2).

Turkish *Rosa damascene* Mill. products can be grouped in four categories: Rose Oil, Rose Concrete, Rose Water and Rose Absolute (3). The products obtained from Isparta Rose are used in food, cosmetics, beauty, aromatherapy and beverage. Main rose oil importers from Turkey are France, USA, Germany, Japan, Switzerland, Belgium, England and Saudi Arabia (4).

Methodology: The material was collected using articles conducted through interviews with Gulbirlilik stuffs and farmers as the main stakeholders, and academics and agricultural experts.

Results and discussion: Gulbirlilik determines rose oil pricing for Turkey's private sector. Unit (kg) prices for each product in **2010** are following: € **0.90** for rose blossom; € **3** for rose water; € **548** for rose concrete; € **1300** for rose absolute; € **6100** for rose oil. As it may seem there is huge difference between rose flower price and its products' prices. In addition, studies show that values (€) per unit (kg) change so much from one product to other. It is **746 €/kg** for rose oil, **127 €/kg** for rose absolute and **70 €/kg** for rose concrete while it is only **0.19 €/kg** for rose blossom which main raw material of the other three product. Total benefit produced by processing rose blossom to its products is **977 344 euro** for rose oil, **565 429 euro** for rose concrete and **977 344 euro** for rose absolute and total added value created by these three products is **1 784 417 euro** in 2009 (5).

There are some rose cultivation problems in Turkey, stemming from production costs, soil fertility, insufficient and irregular rainfall and price fluctuations. There are also large reductions in the amount of land devoted to rose cultivation in Turkey (1). In addition, Producers are not involved in rose oil

business and this is why they cannot benefit from the value added. Producers also lack a stable market, especially, with regards to rose oil export demand (1,5).

Conclusion: Overall, Turkey plays a major role in the production and export of Rose flower in the world and Producers can achieve more value added if they find the right solutions to the problems and develop industry such as cosmetics and aromatherapy.

Keywords: Turkey, Isparta, *Rosa damascene* Mill., Gulbirlilik.

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Study of some phytochemical traits of some *Rosa damascena* populations

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Abstract

Rosa damascena Mill. is an important rose species which contain essential oil. "Damask Rose" is one of the oldest medicinal and aromatic plants in the world. This study was conducted to compare the metabolite compounds across 6 Damask rose populations from Kashan area (Barzuk, Niasar, Azearan, Kolope, Kheirabad and Aheste) and one from Hamedan province (Bahar). In this study, chlorophyll and carotenoid contents of leaves, total phenol and flavonoid contents of leaves and petals, total anthocyanin content of petals, and antioxidant activities of leaves and petals were evaluated for all plants samples. Quercetin contents of leaves and petals were measured by HPLC analyses. Based on the results, the highest leaf chlorophyll and carotenoid contents were obtained from Aheste and Niasar samples. The highest leaf phenol content (28.36 mg/g extract weight) was recorded for Azearan, while no significant difference was observed among populations in petal phenol contents. Azearan population also had the highest amount of flavonoid content in the leaves.

The highest petal flavonoid content (1.22 mg/g extract weight) and petal anthocyanin content (0.168 mg/g extract weight) were recorded for Aheste and Niasar populations, respectively. The highest and lowest antioxidant capacities in the leaves were found in Aheste (51.53% inhibition) and Hamadan (49.44%) populations, respectively, but no significant difference was observed in petal antioxidant capacities between the populations. The average antioxidant capacity in the leaves was higher than those of the petals. According to the results of traits correlation analysis, no significant and positive relationship was observed between phenol and flavonoid contents, and antioxidant capacity in leaf and petal. The highest concentrations of quercetin in leaf and petal, were obtained from Azearan (1.006 mg/g extract weight) and Kheirabad (0.21 mg/g extract weight) populations, respectively.

Keywords: Antioxidant capacity, Phenol, Quercetin, *Rosa damascena*, Traits correlation

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Effect of aromatherapy with *Rosa damascena* on obstetric & gynecologic problems and complaints: A review of randomized clinical trials

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Introduction: Aromatherapy is often used to manage several conditions, including pain, psychological distress, and other signs and symptoms. Numerous studies have shown that aromatherapy with rose oil has good sedative effects besides. The objective of this review was to assess the current evidence regarding the efficacy of aromatherapy on disorders of obstetric and gynecology. *Rosa damascene* Mill is a plant in the family of Rosaceae.

Methods: Electronic databases including PubMed, Google Scholar and SID were searched from 2000 to September 2019 with keywords of 'aromatherapy', *Rosa damascene*, 'essential oil', pain, 'anxiety', 'labor', dysmenorrhea, premenstrual syndrome and sexual dysfunction.

Results: Review of the literature revealed that the effects of *Rosa damascene* aromatherapy as a clinical trial in complaints of Primary dysmenorrhea, labor pain intensity in primiparous women, sexual dysfunction in postmenopausal women and sexual dysfunction of lactating women has been studied.

Discussion: Since many years ago, its flowers have been used in Iran for obtaining rose water. In traditional medicine of Iran, *R. damascene* was suggested for the treatment of different kinds of illnesses. Based on this RCTs and its results It is recommended that aromatherapy could be applied as an adjunctive, low-cost and easy treatment with other today's treatments for reducing ob & gyn problems and complaints. Although further studies are needed to recommend it as an effective treatment.

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Treatment of pregnancy constipation with *Rosa damascena* from the perspective of Iranian traditional medicine scholars

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Introduction: One of the common problems and diseases in pregnant women during pregnancy is constipation or exacerbation of it, which has been suggested in modern medicine and Iranian traditional medicine. Iranian traditional medicine scholars have provided appropriate remedies to these pregnant mothers. One of these is the *Rosa damascene* mixture.

Methods: This study is a library review that used traditional Iranian medicine books, including Canon of Ibn Sina and Kholasat Al-Hikmah of Sayyid Mohammad Hussein Aghili Khorasani.

Results: Iranian traditional medicine scholars have recommended various drugs for the treatment of constipation and for abdominal lining in pregnant women. These include clay milk, almond oil, manna, tamarind and *Rosa damascene* mixture. These include the composition of fresh or dried petals that are soaked in rose water and well blended with sugar or candy and used as directed.

Discussion: The current drugs used to treat constipation in modern medicine may not have satisfactory and lasting results. On the other hand, the side effects of these drugs may be ambient its use. There are different ways of removing pregnancy constipation in Iranian traditional medicine school. The first precaution is to use proper nutrition during pregnancy in accordance with the temperament and the nature of the patient and then to take appropriate medicines that are not harmful to the mother and the fetus. Thus utilization of foods and natural drugs beside maintenance and satisfactory conclusions is notable in reducing the side effects of Treatment and patient satisfaction are very useful and satisfying.

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Rosa damascena Mill. and *Cassia Angustifolia* Vahl. brewing improves Grade 1 fatty liver

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Introduction: Improper nutrition is one of the causes of fatty liver disease which can lead to cirrhosis if left untreated (1-6). The aim of this study was to investigate the effect of *Rosa damascena* Mill and *Cassia Angustifolia* Vahl on the improvement of this disease and its side effects.

Methods: 28 adult male Wistar rats (220±20 g) were randomly divided into four groups (n = 7); control, treated experimental, treated patients and negative control groups. The Grade 1 fatty liver model in these two groups was induced by incorrect nutrition (ie, high-fat, sweetened diet containing white sugar and ice water) for 28 days. The animals were then treated with *Cassia Angustifolia* Vahl (0.4 g/kg) and *Rosa damascena* Mill (0.2 g/kg) for three days with two days interval. After anesthesia and blood samples were taken from the heart, blood parameters were measured using an autoanalyzer.

Results: The most prominent feature of this disease is the elevated plasma levels of the ALT enzyme, which is also evident in the results of the present study. The increase in triglycerides, cholesterol, liver enzymes and urea in the patient group; was significantly ($P \leq 0.05$) decreased in the treated group. Examination of these blood factors in the healthy experimental group; significant differences ($P \leq 0.05$) with the control group indicate that inattentive consumption of this plant in healthy individuals leads to complications

Discussion: *Rosa damascena* Mill and *Cassia Angustifolia* Vahl are effective in improving grade 1 fatty liver disease and can be considered as a rapid efficacy drug.

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Investigation of the effects of ultrasound on vegetal tissues during solvent extraction

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Abstract

The paper presents an insight into the mechanism of the ultrasonic enhancement of solvent extraction through the effect of ultrasound on the vegetal material involved. Thus, a series of experiments has been developed to investigate the effect of ultrasonic energy on the vegetal material and the solvent used. Several results concerning the ultrasonic extractive value, ultrasonic swelling index and the effects of frequency on vegetal material are presented.

Keywords: Ultrasonic solvent extraction-Mechanism-Essential oils



Rosa damascena Marketing

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Abstract:

The word marketing is very broad, derived from the word marketing. Marketing is defined by the UK Marketing and Sales Management Association. Marketing is an innovative management operation that promotes business, anticipating and estimating consumer needs, and evaluating them in order to develop production in a way that meets those needs. "Marketing operations create added value to the products and thus the price difference between the producer price received and the consumer price paid (marketing margin) causing the economists of the marketing margin to express the costs of transporting agricultural products along the market chain. One of the key keys to success in various business areas is the recognition and awareness of market activities. In this regard, a comprehensive economic evaluation has been conducted to provide an appropriate marketing system for the production of flower characters and their products in order to identify and evaluate the marketing paths of the rose production phase to the conversion and consumption of by-products (rose and essential oils).

.If everyone is able to understand the market demand, they can plan their planting type and make a significant change to increase their success by specifying the exact location of the demand, thus creating a specialized information terminal. Upgrading to market agents and consumers can help by completing information on the demand, supply and prices of almost competitive market agents.

Keywords: Marketing, Flower Mohammadi, Market Margin, Market Efficiency



Chemical composition of second Rose essential oils by GC-MS analysis

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Abstract

Rosa damascena, the national flower of Iran has economic importance. Rose oil or golden oil is traditionally produced by hydro distillation method. The aim of this investigation was to evaluate the chemical composition of second rose oils, which produced in TabibDaru Company.

The second rose oil was produced by hydro-distillation of rose water. The chemical composition of essential oil was analyzed by GC-MS and the results of analysis exhibited the presence of citronellol (56.67%), geraniol (17.43%), nonadecane (6.97%), linalool (2.33%), methyl eugenol (2.36%), heneicosane (2.49%), eugenol (1.35%), geranyl acetate (1.72%), and 9-nonadecene (1.79%). The amounts of nerol and rose oxide were 0.59% and 0.26%, respectively. The high content of citronellol in rose oil exhibited the high quality second rose oil.

Key Words: Second rose oil, Citronellol, geraniol, hydro-distillation



Ultrasound Assisted Extraction for the Recovery of Phenolic Compounds from Vegetable Sources

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Abstract:

Vegetable sources and agro-industrial residues represent an important source of phenolic compounds that are useful in a wide range of applications, especially those with biological activities. Conventional techniques of phytochemical extraction have been associated with a high consumption of organic solvents that limits the application of bioactive extracts, leading to the implementation of novel extraction technologies using mechanisms such as Ultrasound Assisted Extraction (UAE). In the present review, an analysis of the involved variables in the extraction yield of phenolic compounds through UAE is presented, highlighting the advantages of this technology based on the results obtained in various optimized studies. A comparison with other technologies and a proposal of its possible application for agro industrial residues as raw material of phenolic compounds is also indicated. Finally, it is concluded that UAE is a technology that is placed within the area of Sustainable Chemistry since it promotes the use of renewable raw materials through the extraction of phenolic compounds, implementing the substitution of organic solvents with solvents that do not present toxic effects, lowering the energy consumption when compared to conventional methods and minimizing process times and temperatures, which is useful for the extraction of thermo-labile compounds.

Keywords: ultrasound assisted extraction; phenolic compounds; vegetable sources



The Effect of *Rosa Damascena* on Sexual Disorders: A review

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Introduction: The *Rosa damascena* mill L. from the Rosaceae family is the native plant in Iran. 'Persian rose' and 'Damask rose' are English and common name of this plant respectively (1). *R. damascena* beside being an ornamental plant, antidepressant, analgesic, bactericide and weed control effects and skin disorder treatment have been reported (2,3). In traditional medicine, Damask rose has been used to treat various disorder such as sexual dysfunction, menstrual and mental disorder (4,5). Sexual dysfunction prevents the individual or couple from experiencing satisfaction from the sexual activity and caused by various condition such as anatomical, physiological, medical and psychological factors. Various studies have shown the efficacy of herbs such as *R. damascena* on improving sexual function and libido (6).

Methods: Data bases containing PubMed, Scopus, Science Direct and Google Scholar were searched with keywords including *rosadamascena*, sexual disorder, sexual dysfunction, sex hormone and treatment from 2000 to 2019.

Results: Many studies have reported beneficial effects of rose essential oil on the male and female sexual disorders by the aphrodisiac, promotes vaginal secretions and balancing sex hormones. For example, a case report study reported the vaginal use of rose essential oil with honey to improve the uterine in the menopause (7). Moreover, the beneficial effects of rose essential oil in the improving sexual disorders caused by the use of selective serotonin-reuptake inhibitors (SSRIs) drugs for major depressive disorders (MDD) in the male (8) and female have reported. In these studies, the rose essential oil by various mechanisms such as antagonistic effect on the post-synaptic 5-HT₂ and 5-HT₃ receptors and inhibits the cortico-limbic 5-HT receptors caused increases libido, ejaculation, and orgasm. It also improves libido by increasing the dopamine and norepinephrine release in the substantianigra and inhibition of nitric oxide (NO) synthesis (9).

In the other study, the aromatherapy effect rose essential oil and *Citrus aurantium* on the premenstrual syndrome was compared. The results of this study showed the rose essential oil has more beneficial effects than *Citrus aurantium* (10).

Discussion: *Rosa damascene* is native to Iran and annually a large amount of this plant is produced and harvested in Iran. According to data from various sources, this plant has the high potential to treat a wide variety of diseases including depression, inflammatory diseases and sexual function disorder. This article reviews the results of several studies on the effect of damask rose on sexual dysfunction and sex hormone balance, but it seems that more clinical trials are needed to further confirm these effects, Further clinical studies should be conducted in the future.

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A review of the effects of *Rosa damascenac* on certaindiseases

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Nowadays there are so many interest on the consumption of natural food and herbal medicine that made researchers to investigate new resources. One of the new herbal resources for production herbal medicine is *Rosa damascena* that many researchers have proved its pharmacological effects from ancient times. *Rosa damascena* known as Damask rose, is the most famous ornamental plant in the family of Rosaceae. It is a perennial bushy shrub which could grow at various climate and soil conditions. *Rosa damascena* is the holy ancient herb with novel applications belonging to the Rosaceae family. They are popular for their beauty, medicinal purposes, decoration and perfume production. In Saudi Arabia it is used for perfume production. In the past, *Rosa damascena* has been used traditionally as a treatment for headache, anxiety and nervous stress and digestive problems. These health effects made researchers to investigate the components of *Rosa damascena* extract and its effects on certain disease. Scientists observed that *Rosa damascena* extract is effective for the reduction of preoperational anxiety for adults and children. The antioxidant and antimicrobial effects of the components of *Rosa damascena* has been proved. The protective effect of *Rosa damascena* extract against aluminum-induced oxidative stress has been investigated. There are many similar studies in this area and investigations are still ongoing.

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Effects of Storage Temperature on Efficiency of Essential Oil Extraction for *Rosa damascena* Mill.

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Abstract

Introduction: *R. damascena* has an important position in Iranian traditional medicine. It is economically a valuable plant with therapeutic applications in modern medicine. The antimicrobial, antioxidant, analgesic, anti-inflammatory, anti-diabetic and anti-depressant properties of *R. damascena* have been confirmed. [1]. Rose oil yield and composition is varied over the different conditions, for example harvesting period, ecological factors, storage time and temperature. In this study, the effect of storage temperature on the yield of essential oil extracted from *R. damascena* oil was investigated.

Method: The flowers of *R. damascena* were collected during the flowering period in June 2018 from Ghazaan, ghamsar, around Kashan (Isfahan province, Iran). Rose petals were separated, divided to four samples of 200 g; one of the samples was subjected to hydrodistillation immediately and the others stored in plastic bags for Different temperatures (-5, 5 and 15 °C) for further experiments. 200 g each of the samples were individually subjected to hydrodistillation for 3.5 h using a Clevenger-type apparatus [2].

Results: Four samples of *Rosa damascena* were subjected to hydrodistillation using a Clevenger-type apparatus, after decanting and drying over anhydrous sodium sulphate, the yellow coloured essential oils were recovered, and efficiencies were measured. The results showed that the highest yield was related to 5 °C and the lowest yield was at 15 °C.

Discussion: The results showed that the storage temperature of *R. damascena* petals had a significant effect on the essential oil yield.

Keywords: *Rosa damascena*, storage temperature, hydrodistillation, essential oil yield

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Optimization of Effective Parameters on the Yield of *Rosa damascena* Essential Oil Extraction

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Abstract

Introduction: *Rosa damascena* has been extensively applied in medicine for the treatment of abdominal and chest pain, digestive problems and skin problems due to its analgesic, anti-inflammatory, and antispasmodic activities [1]. The antibacterial, antioxidant and anti-HIV properties of *R. damascena* essential oil have been demonstrated. In this study, the effect of storage temperature and storage time on the yield of essential oil extracted from *R. damascena* oil was investigated by applying the response surface methodology (RSM).

Method: The flowers of *R. damascena* were collected during the flowering period in June 2018 from Ghazaan, ghamsar, around Kashan (Isfahan province, Iran). Rose petals were separated, divided to twelve samples of 200 g and stored in plastic bags for Different temperatures (-5, 0, 5, 10 and the times (1, 4, 7, 11 and 14 day) for further experiments. 200 g each of the samples were individually subjected to hydrodistillation for 3.5 h using a Clevenger-type apparatus [2]. After decanting and drying over anhydrous sodium sulphate, yellow coloured oils were recovered and efficiencies were measured.

Results: A central composite design (CCD) under response surface methodology (RSM) was employed to optimize experimental parameters for essential oil extraction from rose petals. The results showed that Storage temperature of -5 °C and the time storage of 14 day have been predicted as the optimum values.

Discussion: The results showed that increasing the temperature showed the higher effect on response variable (extraction yield) in compared to increasing the time level.

Keywords: *Rosa damascena*, storage temperature, storage time, hydrodistillation,

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Investigation of Ecological Characteristics of Essential oil Plants of Kashan Ghamsar

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Introduction: The Karkas Mountains and especially the highlands of Kashan Qamsar Watershed due to climatic and socio-economic conditions and diversity of medicinal plant species are among the index ecological areas of the country that it is clearly necessary to research aromatic plants.

Methods: Considering the importance of the subject, 12 aromatic species were selected from this area and their ecological needs were investigated after producing chorological maps and recording their distribution in endogenous environments.

Results: The results showed that *Dracocephalum kotschyi* and *Nepeta persica* are mainly located in the stony -rocky areas of the mountainous altitudes and deployed in crevices of rocks.

Nepeta sessilifolia creates extensive habitats in the sedimentary soils of sloping slopes, road edges and areas with pristine soils. *Stachys pilifera* and *Artemisia persica* are most commonly found in the humid areas of rivers, streams and rivers. *Salvia persica*, *Artemisia biennis* and *Pulicariadysentrica* in current cultivated lands, orchards, under shade trees, and in the margins of streams, current waters grow. *Stachys inflata* and *Salvia limbata* create extensive habitats in the hillsides, on alluvial cones and in deep to semi-deep soils. *Salvia eremophila* and *Teucrium polium* also occupy a wide area in the lowland areas of the slopes, with mild slopes.

Discussion: The findings of this study illustrate the potential of the Qamsar region for the genetic resources of aromatic plants, and due to the limitation of direct utilization of natural habitats of plants, understanding the ecological needs of indigenous aromatic plants will be a favorable aid for cultivation and cultivation of these plants in the region.

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The Comparison of Essential Oils Chemical Compounds of *Rosa damascena* Mill. Three Rose Garden of North of Isfahan Province

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Introduction: *Rosa damascena* Mill. is a Rosaceae family and one of the most important species of Rose. The Iranians are the first people who have found out the properties of food, medical and cosmetic of damask rose (*Rosa damascena*) from the too far away. In this research, essential oils chemical compounds of *R. damascena* Mill. from three rose gardens of Kashan area have been studied.

Methods: The flowers of this plant in the spring of 2017 were collected from Barzok rose gardens (1850 m above sea level), Natanz (1750 m above sea level) and Kamo (2300 m above sea level) and subjected to volatile fraction were isolated by simultaneous steam distillation extraction (SDE). The analysis of the oils was performed by using GC and GC MS.

Results: The main components of the essential oil of Barzok rose garden includes: citronelole (39.74%), geraniol (18.45%), nonadecane (15.28%) and hencosane (5.4%), respectively. The main components of the essential oil of Natanz rose garden includes citronelole (39.10%), geraniol (10.59%), nonadecane (16.10%) and hencosane (5.37%) respectively. The main components of the essential oil of Kamo rose garden includes: citronelole (46.75%), geraniol (14.09%), nonadecane (9.90%), hencosane (6.82%) and benzene etanole (6.76%), respectively.

Discussion: The comparison of essential oils chemical compounds of *R. damascena* of different rose gardens showed that the combination of citronelole in Kamo essential oil was more than Barzok and Natanz. The combination of benzene ethanol in the essential oils of Kamo was reported to be three times higher than in Barzok and Natanz. The chemical composition of methyl eugenol in Kamo essential oil was about 5%, while it was 0.9 to 1.7% in the essential oils of Natanz and Barzak. The composition of hencosan in the essential oils of Natanz and Borzak were almost similar (5%), while in the essential oils of Kamo was 2.2% higher.

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GC-MS Analysis of the *Rosa damascena* Essential Oil from Different Regions of Kashan Area

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Introduction: Approximately 400 oil components have been identified in the rose oil. About 62–77% terpene compounds are found in oil's composition: hydrocarbons (monoterpenes up to 2% and sesquiterpenes 35%), oxygen-containing derivatives (monoterpenes 64–71% and sesquiterpenes 0.5–2%), fatty hydrocarbons and their oxygen derivatives (18–25%), phenylpropanoids (3–5%), and others (0.5–2%). The most important components of rose oil are terpenes, glycosides, flavonoids, and anthocyanins. In Persian Medicine, rose oil has been alleged to have anti-inflammatory, anti-infective and wound healing activities and has been used for relieving, hemorrhoids, inflammatory conditions of gastrointestinal tract, and muscular [1].

Method: The flowers of *R. damascena* were collected during the flowering period in July 2018 from 3 different regions of Kashan area. (Ghamsar: Ghamsar, Kamoo), (Barzok: Barzok, Sedeh, Sedeh-Barzok, Sadiyan, Azaran), (Abyaneh: Bidehen, Chimeh). 200 g each of the samples were individually subjected to hydrodistillation for 3.5 h using a Clevenger-type apparatus [3]. After decanting and drying over anhydrous sodium sulphate, yellow coloured oils were recovered and analyzed with GC/MS.

Results: Ten samples of *Rosa damascena* were subjected to hydrodistillation using a Clevenger-type apparatus and the yellow coloured essential oils were analyzed by GC and GC/MS. The oils were characterized by a high content of Citronellol (from 14.09% in Sedeh area to 44.90% in Azaran area) and geraniol (from 0.52% in Azaran area to 15.29% in Chimeh area).

Discussion: According to the results, high differences were observed between components from different tested samples from different regions. Therefore, more extensive research on the effect of different conditions on the constituents of essential oils can be reviewed separately.

Keywords: *Rosa damascena*, essential oil, hydrodistillation, GC/MS analysis

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Evaluation of the Main Components of *Rose water* in Three Regions of Kashan

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Introduction: *Rosa damascena* as an ornamental plant is commonly known as “Gole Mohammadi” in Iran. Iranian people have been called this plant, the flower of Prophet “Mohammad”. *R. damascena* is traditionally used for treatment of abdominal and chest pains, strengthening the heart, menstrual bleeding, digestive problems and constipation. Rose water is a hydrosol portion of the distillate of rose petals, a by-product of the production of rose oil for use in perfume. It is used to flavor food, as a component in some cosmetic and medical preparations, and for religious purposes throughout Europe and Asia [1].

Methods: The samples of Rose water were collected during in July 2018 from three areas (Ghamsar: Ghamsar, Kamoo), (Barzok: Barzok, Sedeh, Sedeh-Barzok, Sadiyan, Azaran), (Abyaneh: Bidehen, Chimeh), around Kashan (Isfahan province, Iran). 250 ml of the each sample were individually subjected to extraction with 33ml of n-pentane as solvent using a Separator funnel apparatus. After evaporation of the solvent, yellow coloured oils were analyzed by Agilent HP-6890 gas chromatograph equipped with an Agilent HP-5973 mass selective. Identification of components of essential oil was based on retention indices (RI) relative to n-alkanes and computer matching with the Wiley275.L and Wiley7n.L libraries [2].

Results: nine samples of Rosa water were subjected to extraction with n-pentane as solvent, the yellow coloured essential oils were analyzed by GC and GC/MS. The oils were characterized by a high content of Citronellol (16.97%-29.57%), Geraniol (2.20% -18.58%) and Phenylethyl alcohol (46.30% -63.01%)

Discussion: As the results show, there were obvious differences between the percentages of the main components of essential oils extracted from rose water that could be because of the different conditions, for example harvesting period and ecological factors.

Keywords: *Rosa damascena*, Rose water, citronellol, geraniol, phenyl ethyl alcohol

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Evaluation of Antioxidant Activity of Different Parts from *Rosa damascena* Mill.

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Introduction: *Rosa damascena* Mill., known as Gole Mohammadi is one of the most important species of Rosaceae family flowers. *R. damascena* is an ornamental plant and beside perfuming effect, several pharmacological properties including anti-HIV, antibacterial, antioxidant, antitussive, hypnotic, antidiabetic, and relaxant effect on tracheal chains have been reported for this plant. Oxidative stress is now believed as the main cause of many pathologic conditions such as inflammation, arthritis rheumatoid, cancer, neurodegenerative disorders and ageing and antioxidant rich diets are able to prevent and reduce these abnormalities effectively [1]. In this regard, a growing rate of research was conducted on many plant species in order to find new natural bioactive compounds in them.

Method: In this study, different parts of *R. damascena* were Soxhlet-extracted with methanol. The antioxidant potential of extracts was evaluated using two assays method namely 2,2-diphenyl-1-picrylhydrazyl (DPPH) and β -carotene-linoleic acid. Also, Total phenolic content of the plant extracts were determined by Folin-ciocalteu Reagent (FCR) as gallic acid equivalents [2].

Results: All extracts exhibited remarkable antioxidant activity in DPPH assay method (16.18-63.09 $\mu\text{g/ml}$), which were comparable to BHT (16.13 $\mu\text{g/ml}$). β -Carotene/linoleic acid test is grouped in the hydrogen atom transfer (HAT) based antioxidant tests and showed moderate activity of the plant extracts in this test. The considerable antioxidant capacity of the methanol extracts of the plant may be a consequence of its remarkable phenolic compounds content (92.31 - 204.28 $\mu\text{g/mg}$) which was reflected in its Folin-Ciocalteu test result.

Discussion: Growing tendency for replacing synthetic additives by natural ones has emerged great interest on the evaluation of antioxidant and antimicrobial properties of plants products in both academia and industry. Appreciable antioxidant activity of the plant extracts in this report encourages more elaborate investigations in this respect.

Keywords: *Rosa damascena*, Extract, Antioxidant activity, Total phenolic

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Evaluation of Antimicrobial Activity and cCytotoxicity of *Rosa damascena* Mill.

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Abstract

Introduction: *Rosa damascena* as an ornamental plant is commonly known as “Gole Mohammadi” in Iran. Iranian people have been called this plant, the flower of Prophet “Mohammad”. *R. damascena* is traditionally used for treatment of abdominal and chest pains, strengthening the heart, menstrual bleeding, digestive problems and constipation. The antimicrobial, antioxidant, analgesic, anti-inflammatory, anti-diabetic and anti-depressant properties of *R. damascena* have been confirmed. The antimicrobial and anticancer efficacy of essential oil may be influenced by several important factors including their chemical composition, method of essential oil extraction, different bacterial species.

Method: In this study, *Rosa damascena* collected from Kashan area was analyzed. 200 g of sample was individually subjected to hydrodistillation for 3.5h using a Clevenger-type apparatus [1]. After decanting and drying over anhydrous sodium sulphate, yellow coloured oils were recovered and analyzed Antimicrobial and anticancer effect of the essential oil of it. The antibacterial activity against 10 gram negative and gram positive bacteria and 2 fungus and yeast strains were assessed by disc diffusion (DD) method. Moreover minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) tests were also investigated [2]. Evaluation of anticancer activity was performed via brine shrimp lethality assay.

Results: exhibited high activity in DD method (9-38mm) that highest activity (100% inhibition) was for *A. niger* and *C. albicans*. Essential oil of *R. damascena* showed activities against different microorganisms with MICs ranging from 125 to 2000 $\mu\text{g/mL}$. The highest activity (100% inhibition) was for essential oil of *R. damascena* against *C. albicans* microorganism (MIC of 125 $\mu\text{g/mL}$). Cytotoxicity activity of the mentioned sample was also very high, with $\text{LC}_{50} \leq 100$.

Discussion: The results suggest application of rose essential oil as a natural antimicrobial and health-promoting agent and further studies are required to separate and identify the active antimicrobial phytoconstituents of petals to utilize them pharmaceutically.

Keywords: *Rosa damascena*, Hydrodistillation, Essential oil, Antimicrobial, Cytotoxicity

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Newly portable Harvesting Machine with an Automatic Head for *Rosa damascena*

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Abstract

Rosa damasceneis one of the important Rosa flower varieties in all over the world and one of the famous plants in horticulture history. Rosa flowers will harvest from the first of Ordibehesht to the end of Khordadbefore rising sun and in the cool air of morning. In order to reduce the critical conditions, using a portable and easy application machine is necessary. In the current research, a portable machine for flower harvesting designed and developed. This machine contains a cutter unit, suction pipe, gasolinesucking motor, frame and a cyclone separator. All components of the machine including motor and cyclone are assembled on carriage frame and transported by workers. Flower cut under the receptacle by anautomatic cutter and sucked to the flexible pipe by 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 block design with three treatments and four 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 and harvesting period time in every treatment was measured. The control treatment was considered traditional flower harvesting by hand. Based on the evaluation results, increasing the rpm of motor was caused to decrease the net harvesting period time although increase fuel consumption. According to the results, employing the machine was decreased harvesting periodup to 25% in comparison with traditional harvesting.

Keywords: *Rosa damascena*, Mechanization harvesting, Portable machine



Adulteration in Rose Oils

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Essential oils are valuable natural products obtained from different parts of plants. Plant matter and extraction methods are important factors on quality of essential oils. These oils contain many components. Only some of them are characteristic and only specific to the product from which they are obtained. Rose oil is one of expensive essential oils because it produces very little essential oil from tons of rose flowers' petals. There is increasing demand for rose oils, which has resulted in cases of adulteration. Essential oils are analyzed by different techniques such as sensory analysis, physical analysis, chemical analysis and instrumental techniques to ensure quality, consumer safety and fair trade. These techniques can be easily used in adulteration of oils. In this review, some of them could be explained in details.

Keywords: Rose oil, adulteration, instrumental analysis



An Overview on Pharmacological Effects of *Rosa Damascena* Grown in Iran

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Abstract

Rosa damascena mill L., known as Gole Mohammadi in is one of the most important species of Rosaceae family flowers. *R. damascena* is an ornamental plant and beside perfuming effect, several pharmacological properties including anti-HIV, antibacterial, antioxidant, antitussive, hypnotic, antidiabetic, and relaxant effect on tracheal chains have been reported for this plant. The most therapeutic effects of *R. damascena* in ancient medicine are including treatment of abdominal and chest pain, strengthening the heart, treatment of menstrual bleeding and digestive problems, and reduction of inflammation, especially of the neck. Several components were isolated from flowers, petals and hips (seed-pot) of *R. damascena* including terpenes, glycosides, flavonoids, and anthocyanins. This plant contains carboxylic acid, myrcene, vitamin C, kaempferol and quarcetin. Flowers also contain a bitter principle, tanning matter, fatty oil and organic acids. The medicinal functions of Rosaceae are partly attributed to their abundance of phenolics compound. Phenolics possess a wide range of pharmacological activities, such as antioxidants, free-radical scavengers, anticancer, anti-inflammatory, antimutagenic, and antidepressant. Ethanolic extract of the flowering tops of *R. damascena* has been shown to possess a potent depressant activity on CNS in mice. Some of these effects that evaluated are hypnotic, anticonvulsant, anti-depressant, anti-anxiety, analgesic effects. This article is a comprehensive review on pharmacological effects of *R. damascena*.

Keywords: Human health, Medicinal properties, Natural products



A Review on Antidepressant and Anxiolytic Activity of *Rosa × damascena* Mill.

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Introduction: Anxiety and depression are known as the most common mental disorders which lead to reduction of quality of life by interfering with daily work, result in lost time and lower productivity (1). Currently, the use of anti-depressants and anti-anxiety medications are the most common drug categories in the treatment of these conditions and there are lots of concerns due to side effects during treatment process or withdrawal. For this reason, in recent past decades, the community has witnessed the increase in use of natural products for treatment of various types of mood disorders, including depression and anxiety. These products are also considered to be as safe alternative options. Herbal medicines also can have the ability to treat and reduce the depression and anxiety symptoms with various mechanisms. *Rosa × damascena* Mill., commonly known as Damask rose, and known as Gol-e-Mohammadi in Iran, is a perennial plant shrub and the most famous ornamental plants from the family of Rosaceae.

Methods: We gathered data by searching in scientific databases (Pubmed, Web of Science, Scopus and other web sources) and reference books.

Results: The flowers contain several compounds include terpenes such as β -citronellol, Geraniol and Nerol, as well as flavonoids and anthocyanins (2). Damask rose has a long history of treating various types of diseases in various types of modern and alternative medicine. In traditional Persian medicine, this plant has been used as an analgesic and a strengthener of heart, brain, and digestive system. In modern medicine, several pharmacological studies have been reported on this plant and its therapeutic effects such as anti-anxiety, antibacterial, anti-oxidant, analgesic, sedative, anti-diabetic and relaxant effects of this plant have been reported, which are more likely all related to poly-phenolic and essential oil compounds. Some researchers correlate the anti-depressant and anxiolytic activities of the plant to its antagonistic effects on 5-HT₂ and 5-HT₃ post-synaptic receptors of the corticolimbic region of brain. In addition, the plant essential oil can increase the secretion of dopamine and norepinephrine in the substantia nigra section and inhibit the synthesis of nitric-oxide (3).

Discussion: According to these gathered data, *Rosa × damascena* may be selected as a considerable herb for isolation of bioactive compounds and a choice for a new drug production in depression and anxiety treatment.

Keywords: Damask rose, Gol-e-Mohammadi, *Rosa × damascena* Mill. depression, anxiety.

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Study of Some Phytochemical Traits of Some *Rosa damascena* Populations

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ABSTRACT

Rosa damascena Mill. is an important rose species which contains essential oil. "Damask Rose" is one of the oldest medicinal and aromatic plants in the world. This study was conducted to compare the metabolite compounds across 6 Damask rose populations from the Kashan area (Barzuk, Niasar, Azearan, Kolope, Kheirabad and Aheste) and one from Hamedan province (Bahar). In this study, chlorophyll and carotenoid contents of leaves, total phenol and flavonoid contents of leaves and petals, total anthocyanin content of petals, and antioxidant activities of leaves and petals were evaluated for all plant samples. Quercetin contents of leaves and petals were measured by HPLC analyses. Based on the results, the highest leaf chlorophyll and carotenoid contents were obtained from Aheste and Niasar samples. The highest leaf phenol content (28.36 mg/g extract weight) was recorded for Azearan, while no significant difference was observed among populations in petal phenol contents. Azearan population also had the highest amount of flavonoid content in the leaves. The highest petal flavonoid content (1.22 mg/g extract weight) and petal anthocyanin content (0.168 mg/g extract weight) were recorded for Aheste and Niasar populations, respectively. The highest and lowest antioxidant capacities in the leaves were found in Aheste (51.53% inhibition) and Hamadan (49.44%) populations, respectively, but no significant difference was observed in petal antioxidant capacities between the populations. The average antioxidant capacity in the leaves was higher than those of the petals. According to the results of traits correlation analysis, no significant and positive relationship was observed between phenol and flavonoid contents, and antioxidant capacity in leaf and petal. The highest concentrations of quercetin in leaf and petal, were obtained from Azearan (1.006 mg/g extract weight) and Kheirabad (0.21 mg/g extract weight) populations, respectively.

Keywords: Antioxidant capacity, Phenol, Quercetin, *Rosa damascena*, Traits correlation



Rose water waste Biochar as Efficient Adsorbent for the Removal of Basic Blue 41 Dye from the Aqueous Solution

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Introduction: Adsorption process using various adsorbents is one of the suitable approaches for wastewater treatment. Due to high efficiency, cost-effectiveness, and environmentally friendliness agricultural waste derived biochars can be used for the removal of pollutants from wastewater. Therefore, in this study rose water waste was used to synthesis biochar and its efficacy for the removal of Basic Blue 41 dye from the aqueous solution was assessed.

Methods: Rose water wastes were collected from rose water manufactories (Golabgiri) in Kashan. Following pyrolysis process, Rose water waste biochar was fabricated at 600° C. EDX, XRD, SEM, BET and FT-IR techniques were used to characterize the biochar. Batch system was used to determine the effects of solution pH, contact time, dye initial concentration, and adsorbent dosage factors on the dye removal from aqueous solution. Langmuir isotherm and Freundlich were studied to express the reaction between dye and lead with adsorbent and two kinetics models of pseudo- first-order and pseudo-second-order were studied for calculating the constant rate of absorption under optimal absorption conditions.

Results: According to the results, 4 parameters had affected the process of work; so that for the Basic Blue 41 dye, 6 hours, adsorbent concentration of 0.1 g, pH=5 and concentration of 500 mg / L were optimal. The highest percentage of dye removal was 90 %. According to the obtained data, absorption of Basic Blue 41 dye ($R^2 = 0.99$) had followed Freundlich isotherm model. The kinetic study of absorption also showed that, the absorption process of Basic Blue 41 dye had followed the pseudo-second-order model.

Discussion: The obtained results indicated a relatively high efficiency of the rose water waste biochar adsorbent in removing dye from aqueous solution.

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Use of Modern Techniques to Identify Volatile Compounds in Rose Products

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Roses are ancient symbols of love and beauty. Beside to rose, rose products such as rose water and rose oil are used in the perfume, cosmetic, pharmaceutical and food industries. The identification of active compounds in these products are important in determining the quality and purity of an essential oil. The volatile compounds have been determined using different methods. Analysis of volatile compounds in essential oils has been used routinely using gas chromatography (GC) and GC coupled to mass spectrometric detection (GC/MS). Beside to traditional methods, modern techniques have been developed for some advantages. One of the methods is headspace solid phase microextraction (HS-SPME) technique which have faster sample preparation and highly sensitive according to traditional methods. The other new extraction technique is supercritical CO₂ extraction of rose flowers at different temperature and pressure conditions.

Keywords: Rose products, traditional methods, modern methods, volatile compounds



Decolourization and COD Removal from Reactive Dye-Containing Wastewater Using SonoPhotocatalytic Technology

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Abstract:

Decolourization and COD removal from synthetic wastewater containing Reactive Brilliant Orange K-R (RBOKR) dye using sonophotocatalytic technology was investigated. Experimental results showed that this hybrid technology could efficiently remove the colour and reduce COD from the synthetic dye-containing wastewater, and that both processes followed pseudo first-order kinetics. At the condition of 0.1 m³ h⁻¹ airflow, 0.75 g dm⁻³ titanium dioxide and 0.5 mmol dm⁻³ RBOKR solution, the rate constants of decolourization and COD removal were 0.0750 and 0.0143 min⁻¹ respectively for the sonophotocatalytic process; 0.0197 and 0.0046 min⁻¹ respectively for the photocatalytic process and 0.0005 and 0.0001 min⁻¹ respectively for the sonochemical process. The rate constants of sonophotocatalysis were greater than that of both the photocatalytic and sonochemical processes either in isolation or as a sum of the individual process, indicating an apparent synergetic effect between the photo- and sono-

Keywords: sonophotocatalysis; photocatalysis; ultrasound; dye decolourization; COD removal; synergetic effect



Marketing Strategies and Export of Iranian Medicinal Plants

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Abstract:

In order to reduce the dependence of the Iranian economy on crude oil exports and the shift to a multipurpose export economy, export policy orientations should be changed to the benefit of exporting non-oil goods, including agricultural exports. A look at the share of the agricultural sector in non-oil exports to Iran shows that this trend is declining. Therefore, attention should be paid to the expansion of this sector's exports. A look at the statistics and time series of the past years shows that despite Iran's good rank in the production and cultivation level of medicinal plants, the export status of these products is not in a good position. Among the agricultural products, medicinal plants are one of the most important agricultural export items in Iran which play a great role in valuing and creating added value for the agricultural sector. The purpose of this study is to investigate the role of marketing strategies on export of Iranian *medicinal* plants. Necessary data were collected from 30 herbal exporting companies for the years 2011 - 2017 using simple random sampling. Due to the combined nature of the data collected and the export impact of its amount in previous years, the dynamic panel model was chosen as the superior model. On the other hand, this study attempts to identify the strengths, weaknesses, threats and opportunities for export of medicinal plants. The results showed that differentiation strategies, market development and product development have a positive and significant impact on export performance of exporting companies. Market penetration strategy, although not statistically significant, also varies with the export value of medicinal plants.

Keywords: Marketing Strategies, Export, Medicinal Plants



Global Value Chain Analysis of Damask Rose in the World and Iran

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Abstract:

The agricultural sector in the Iranian economy is one of the most important of the three sectors which plays an important role in creating added value and sustainable development. Medicinal plants are one of the most important subdivisions of this field that paying attention to the production process until its final consumption is a high priority in improving Iran's share of the trade in these products in the world. Damask Rose is one of the important items in the medicinal plants sector which has received increasing attention in recent years due to its high valuation and lower production costs. Iran, despite having the world's first production of Damask Rose, does not have a good position in exporting its products. This doubles the need to pay attention to the supply chain and value of this product. The purpose of this research is to identify and rank the value chains of Damask Rose in the world and its main producing and exporting countries. Data analysis was performed using network analysis model. The results showed that in the three ideal, normal and crude weights, there were no significant differences between the two value chains for medicinal and health use. But in terms of the two criteria of packaging and value chain processing, there are significant differences in creating value added in different areas. Accordingly, the development of this product's processing and attention to its export in accordance with the taste of the target countries plays an important role in enhancing Iran's share of the value chain in the world.

Keywords: *Damask Rose, Value Pair, Network Analysis*



Clustering the Target Markets of Iranian Medicinal Plants Export

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Abstract:

Medicinal plants have been great importance throughout human life. Because the variety of medicinal plants in Iran is huge, exporting these types of plants can be a great deal for Iran. Clustering is a tool for determining the structure of data, which has been used less in economic studies. This process involves six steps; selecting clustering variables, selecting clustering method, choosing similarity criteria, selecting clustering algorithms, choosing the number of clusters, and interpreting clustering results. In this study, according to data from 2001 to 2016 in FAO, four types of herbs, fennel, anise, badian, and coriander were used to cluster the target export markets (the top 20 countries). These 20 countries were selected based on market share indicators, market size, market growth, export continuity, market structure, competitive advantage and export price, then clustered using k-means clustering technique and SPSS software. The results showed that these countries are divided into four categories based on export prices. Pakistan, UAE and Ukraine the first cluster, Japan and Korea in the second cluster of Peru, India, China, Bangladesh, Bahrain, Turkey, Qatar and Kuwait in the third cluster, The countries of Singapore, England, Colombia, Malaysia, Spain, Belgium, Germany and Russia were placed in the fourth cluster.

Therefore, Iran's exports should be based on this category therefore Iran can continuously maintain its export markets. Therefore, Iran's exports should be based on this cluster so that Iran can continuously maintain its export markets and plan them according to these clusters. The public sector in support of the exporter should set tariffs on crops to encourage the export of medicinal plants and more valuable. The private sector also aims to make the target more successful with the use of modern marketing methods, especially e-commerce, in exploiting these markets.

Keywords: K-Means technique, market size, export price, export continuity



Investigation of Chemical & Physical Properties and Composition of the Essential Oil of *Rosa damascena* Mill.

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Introduction: Iran was the main producer of rose oil until the 16th century and exported it to all over the world [1]. The essential oils of *R. damascena* are known for their fine perfumery applications and the use in cosmetic preparation. In recent years, the anti-HIV, antibacterial and antioxidant activities of *R. damascena* essential oil have been demonstrated [2].

Methods: In this work, the plant material was collected from Qamsar near to Kashan, Isfahan Province, Iran.

Gas chromatography/mass spectrometry (GC/MS) analysis was carried out using a Hewlett-Packard 6890/5973 operating at 70.1 eV ionization energy, equipped with a HP-5 capillary column (phenyl methyl siloxane, 25 m×0.25 mm i.d) with He as the carrier gas and split ratio, 1:20. Oven temperature was performed as follows: 60 °C (3 min.) to 260 °C at 3 °C/min.; detector temperature, 260 °C; carrier gas, He (0.9 ml/min).

Retention indices were determined by using retention times of *n*-alkanes that were injected after the essential oil under the same chromatographic conditions. The components of the oil were identified by comparison of their mass spectra and retention indices (RI) with those given in literature and by comparison of their mass spectra with the Wiley library or with the published mass spectra [1-2].

Results and discussion: Thirteen components were identified in the essential oil of *R. damascena*. α -Pinene (0.36%), Nonadecane (10.89%), Heneicosane (4.33%), Citronellul acetate (3.93%), Citronellol (55.97%), Eicosane (0.90%), Geraniol (9.15%), Geranyl acetate (1.34%), Germacerene-d (1.06%), Heptadecane (1.36%), Tricosane (0.67%), Cis-farnesol (0.68) and Trans-caryophyllene (0.57) the main constituents of the oil. The sample studied by us is different from the other Iranian samples [14, 15]. According to Mirza, citronellol (59.5%), geraniol (13.2%) and phenyl ethyl alcohol (5.6%) were among the main components of *R. damascena*. In this report nonadecane and heptadecane were identified (2.2%) and (1.4%), respectively. The other Iranian sample [15] was characterized by high amounts of eicosane (29.88%), b-citronellol (25.59%), docosane (14.07%), 1-nonadecene (6.54%), which were different in our sample. The other Iranian sample [15] was characterized by high amounts of eicosane (29.88%), b-citronellol (25.59%), docosane (14.07%), 1-nonadecene (6.54%), which were different in our sample.

Key word: *Rosa damascena*, Essential oil, Gas Chromatography, Citronellol, Investigation

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Impact of Climate Change on Medicinal Plants Marketing

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Abstract:

Experiences of last decades show that emphasis of economy on income of single product same as petroleum selling results in instability of export income. Orientation of export policies may be changed for exporting of non-oil goods including export of agricultural products to decrease dependence of Iran economy to export of petroleum and moving toward goals of resistance economy policy. Iran and some agricultural oriented countries are the main objective of this study in medicinal plants marketing. Among agricultural products, herbs are the most important export items of agriculture which have great portion in creating added value in this sector and making foreign exchange. Study of statistics and previous years' time series information shows that export of these products has not suitable situation despite good rank of Iran in production and cultivation of herbs, although India had an acceptable and good rank same as IT and Tourism industry progress. This research is going to study position of Iran and India in global market of herbs emphasizing on damask rose and its comparison with various countries. Although recent years drought and contraband occurrence have result in fluctuation of production but expert views to chain of production to export cause increase of production and export. The most important challenges of herbs commerce and becoming undesirability of Iran position in foreign market of herbs are lack of technical knowledge in export, weakness of foreign marketing, weak support of government, high expenses of standardizing products for export, lack of cooperation between export trade unions and agencies in herb industry and their negative competition, incorrect recognition of aiming market, lack of having trade mark for many export items of herbs, political risks and decrease of bargaining power of foreign trade sector in foreign markets. Finally, four strategies based on target countries study are provided for Herbs Global market improvement.

Key Words: Medicinal Plants, Export, Strategies, Market, Global



Oral Presentations



Industrial Rose (*Rosa damascena* Mill.), Production in Turkey and New Goals

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Abstract: Roses are quite important ornamental plants in almost all over the world. Roses are multifunctional woody shrubs. Among rose species, Damask rose – *Rosa damascene* – has a very special place in human life. Damask rose is also highly regarded in the Middle Eastern countries because of its musky smell which is a very important raw material for perfume industries and for other uses.

Damask rose was introduced to Turkey in the very late 1800's from Bulgaria and distributed to all over Turkey for its adaptation for the production of perfumes and rose water. Soon after its introduction, Isparta province situated in Western Mediterranean Region became the main center of Damask rose production. Nowadays, nearly 50% of the world Damask rose flower is produced in this particular city. Rose cultivation is not easy, it requires a special ecology, and must be cultivated in a professional way. Damask rose faces a number of diseases and hazardous insect damages which should be controlled in time with the minimum application of chemical practices. In recent years, organic Damask rose is becoming popular because of human health and environmental concerns.

Damask rose processing factories in Isparta are equipped with new technologies and appliances meeting the demand of domestic and international markets. Damask rose production and rose processing industries create intensive employment as well.

As in other branches of production and processing, Damask rose industries should have new goals, closely following new technologies and developments including: a) breeding high quality thornless multiple flowering varieties and more resistant to diseases and insect damages and more drought resistant cultivars.

Key words: Damask Rose, Rosa Damascena production, industries, Turkey



Efficacy of Topical Rose (*Rosa damascena* Mill.) Oil for Migraine Headache: A Randomized Double-Blinded Placebo-Controlled Cross-Over trial

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Abstract

Aim: To evaluate the effect of topical formulation of *Rosa damascena* Mill. (*R. damascena*) oil on migraine headache, applying syndrome differentiation model.

Materials and Methods: Forty patients with migraine headache were randomly assigned to 2 groups of this double-blind, placebo-controlled cross-over trial. The patients were treated for the first 2 consecutive migraine headache attacks by topical *R. damascena* oil or placebo. Then, after one week of washout period, cross-over was done. Pain intensity of the patients' migraine headache was recorded at the beginning and ten-sequence time schedule of attacks up to 24h. In addition, photophobia, phonophobia, and nausea and/or vomiting (N/V) of the patients were recorded as secondary outcomes. Finally, gathered data were analysed in a syndrome differentiation manner to assess the effect of *R. damascena* oil on Hot- and Cold-type migraine headache.

Results: Mean pain intensity of the patients' migraine headache in the different time-points after *R. damascena* oil or placebo use, was not significantly different. Additionally, regarding mean scores of N/V, photophobia, and phonophobia severity of the patients, no significant differences between the two groups were observed. Finally, applying syndrome differentiation model, the mean score of migraine headache pain intensity turned out to be significantly lower in patients with "hot" type migraine syndrome at in 30, 45, 60, 90, and 120min after *R. damascena* oil application compared to "cold" types (P values: 0.001, 0.001, <0.001, <0.001, and 0.02; respectively).

Conclusion: It seems that syndrome differentiation can help in selection of patients who may benefit from the topical *R. damascena* oil in short-term relief of pain intensity in migraine headache. Further studies of longer follow-up and larger study population, however, are necessitated for more scientifically rigorous judgment on efficacy of *R. damascena* oil for patients with migraine headache.

Key words: Headache; Medicinal plants; Migraine disorders; *Rosa damascena* Mill.; Rose; Traditional Persian medicine



Medicinal & Aromatic Plants: In Health and Beauty

Prof. Dr. Ebrahim Naderali

Faculty of Science, Liverpool Hope University. Liverpool, UK.

Rosa damascena has been used for both health and beauty from ancient times. Extracts from its leaves, flower petals and the petal core have been used for many ailments throughout the world. Similarly, extracts from flower petals have become powerful cosmetic tools around the globe for centuries. Despite its widespread use, there is little or no hard data on the exact mechanism(s) of *Rosa damascena* in health. This paper will discuss the current scientific data available on various extracts from different parts of the *Rosa damascena* plant. This paper will also focus on examining scientific validity of medicinal plants health claims with emphasis on *Rosa damascena*.

Keywords: *Rosa damascena*; Health claims; Petals



Keynotes in standardization and preparation of rose water from *Rosa damascena*

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Abstract: *Rosa damascena* is one of the most important medicinal herbs which produces rose oil and rose water. Iran is one of the main producers of rose water and rose oil, as well as the principal consumer of rose water in Iranian traditional medicine. Rose water is prepared in three scales including traditional, semi-traditional and industrial scale. There are four Iranian National Standards for rose water. One of them is about microbiological characteristics with an important role in quality control of rose water. Physicochemical properties are explained in the other standard and methods for analysis of rose water is represented in the third and fourth standards. Although this information is not enough for finding some adulterations in preparation of rose products alone. So various analytical instruments like spectrophotometry could be used by regulatory organization. Emphasizing the identification of volatile compounds can be another way to discover adulterations. The major volatile components in rose water are phenylethyl alcohol (45-85%), citronellol, nerol, geraniol and linalool while aliphatic hydrocarbons are the main constituents of the first oily phase of rose water. The first oily phase has lower economic value than second rose oil. Three factors that influence the quality of rose water include time of collection, transportation at 15 °C, and storage between 4 and 10 °C. Finally, the results of this presentation could be useful for further studies on the optimal supplying conditions of traditional and industrial rose water.

Keywords: Rose water, standard, spectrophotometry, phenylethyl alcohol

Reference:

1. Iranian national standard, 1386, ISIRI 3270 1st version.
2. Iranian national standard, 1390, ISIRI 5759 2nd version.
3. Iranian national standard, 1393, ISIRI 14872nd version.
4. Iranian national standard, 1396, ISIRI 22448 1st edition.



Rose, Biodiversity and Humans

Dr. Mohammad Bagher Bahardar

Davis University of California, USA

Abstract

In this talk a short history of the Damask rose in literature and farming is introduced, with a special look at its connection to biodiversity.

Importance of diversity in plants and animals have been discussed and analyzed by scientists for many years. However, the depth of this subject affecting harmony of life on the planet has not been absorbed enough by public, especially in developing countries. Unfortunately this has disallowed serious movements towards the protection of biodiversity in ecosystems all around the world.

Historically the loss of biodiversity has been proved to be one of the main causes of ecosystem destruction; this also affects humans in social and financial losses. By bringing up statistics and examples, I finish the talk by noting what we can learn from biodiversity and the loss of it in our social life.



Cohobation Column in Tabib Daru Company and production of Rose Oil

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Rosa damascena as Iranian national flower has ancient history, which its use returns to at least 1500 years, ago. One of the most important products with commercial value is rose Oil, which is traditionally extracted from fresh rose petals by hydro-distillation method¹. Methods such as super critical fluid extraction are expensive and solvents can be toxic. In hydro distillation method, the level of oil loss may be between 0.2-0.7%. Therefore, the loss of essential oil for rose oil with low yield of oil is high. Furthermore, the extracted oil is not whole, and is deficient in this rose-smelling ingredient². In order to produce complete oil, the cohobation type distillation unit in TabibDaru Company was designed and manufactured according to the requirements of the pharmaceutical industry. Cohobation is a procedure to extract water soluble components and add them back to the essential oils. The principle behind it is to minimize the losses of oxygenated components, particularly phenols which dissolve to some extent in the distillate water. After setting this system, in our company, 3.5 tons of fresh rose water produced 1 kg rose oil and the extracted oil were analyzed by GC-MS³. The rose oil was fluid transparent liquid oil with pale yellow color and typical odor of rose oil.

Citronellol (33.64%), geraniol (3.24%), linalool (4.8%) were the main aromatic compounds of this rose oil. The percent of waxes were about 48%. The byproduct of cohobation column was containing a rose water with 14.2% essential oil content, which phenyl ethyl alcohol (99.01%) was the main component of rose water, followed by eugenol (0.56%) and benzyl alcohol (0.43%). Cohobation type distillation unit is more efficient, used for distillation of high value water miscible essential oil from aromatic crops, like rose.

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- 2- DilworthLL, RileyCK, StennettDK. Plant constituents: carbohydrates, oils, resins, balsams, and plant hormones. Pharmacognosy 2017.61-80.
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Your Customer/Your End User

Dr. Hossein Nazim Ali

CPMC Ltd, London, UK

This presentation will highlight the importance of the end-user in producer and the products success. By closely examining the end-user's (customers) experience, the presentation will examine all influencing factors. Various touch points in the customer's journey and the importance of each touch point will be discussed. The end-to-end journey will also be examined looking at cultural and societal expectations and how by having a simple, basic knowledge of prospective customer can make the whole experience pleasurable and memorable. Behavioural psychology is introduced and concepts of sequence, segments, and control environment and their relevance to the end-user's experience are examined. The relevance of customer journey mapping and how to develop this is discussed. Finally, real examples are provided from international websites to explain what opportunities are being missed by producers and supplies in Kashan.



A Pilot Study on Polyphenols Recovery and Chromatographic Profiling of *Rosa damascena* Oil Distillation Petal Waste and Its Other By-Products

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Introduction: Application of water steam distillation for production of rose oil from rose flowers leaves much petal. These contain many kinds of polyphenols and polysaccharides that could be introduced as biological active compounds. Rose is a source of the other precious by-products including essential oils, concrete and absolute. There are a large variety of *rosadamascena* cultivated in Iran, and it is worthwhile to find superior cultivar. Then fresh petals of roses were collected from four area including Shiraz(Meymand),Kerman,Kashan(Niasar and Ghamsar).

Methods: Polyphenols were completely extracted by both methanol and water. Different kinds of resins were evaluated for their ability of polyphenols isolation. Both polyphenols and volatile constituent of rose petal, essential oil, concrete and absolute were completely analyzed by GC-MS and LC-MS techniques.

Results: All parameters including type of resin and loading factors were completely optimized. The chemistry of polyphenols were revealed by LC-MS. Among them kaempferol-3-o-glucoside, quercetin-3-o-glucoside and ellagic acid were as the most dominant components were determined. A comparative GC-MS metabolite profiling of essential oil, concrete and absolute from the four region of Iran showed some component in common but in different ratio. For example, phenyl ethyl alcohol, citronellylformate, 2-phenyl ethyl acetate, nondecane, and eicosane were found as major component Shiraz (Meymand).

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Agricultural Risks and Climate Change Impact On Medicinal Plants Marketing

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Abstract:

Among agricultural products, herbs are the most important export items of agriculture which have great portion in creating added value in this sector and making foreign exchange. Most of Asian countries face and struggle with enormous natural disasters such as climate change and agricultural risks that has destructive effects on production which influence farmer's livelihood but also incommode them in organizing their marketing and financial obligations in order to farm operations and investment. Iran and some agricultural oriented countries are the main objective of this study in medicinal plants marketing, concentrating on Iran and India in global market of herbs emphasizing on damask rose and its comparison with various countries. Agricultural risks are mainly production risk due to climate change, natural disasters, pest spread, disease and lack of management. Market risks are also due to price fluctuation, seasonal produce, geographical distance of production center and marginal consumers. Orientation of export policies may be changed for exporting of non-oil goods including export of agricultural products to decrease dependence of Iran economy to export of petroleum and moving toward goals of resistance economy policy. Study of statistics and previous years' time series information shows that export of these products has not suitable situation despite good rank of Iran in production and cultivation of herbs, although India had an acceptable and good rank same as IT and Tourism industry progress. Although recent years drought and contraband occurrence have result in fluctuation of production but expert views to chain of production to export cause increase of production and export. The most important challenges of herbs commerce and becoming undesirability of Iran position in foreign market of herbs are lack of technical knowledge in export, weakness of foreign marketing, weak support of government, high expenses of standardizing products for export, lack of cooperation between export trade unions and agencies in herb industry and their negative competition, incorrect recognition of aiming market, lack of having trade mark for many export items of herbs, political risks and decrease of bargaining power of foreign trade sector in foreign markets. Finally, four strategies based on target countries study are provided for medicinal plants market improvement.

Keywords: Risks, Medicinal Plants, Export, Strategies, Market.



Effect of Genetic Variation and Method of Extraction on Essential Oils Yield of *Rosa damascena* Mill.

Prof. Dr. Mohammad Bagher Rezaee, Kamkar Jaimand

Research Institute Forest and Rangeland

Since long time, Rosa flower in the world has been considered a symbol of aroma and love. The fragrance of the *Rosa damascena* has been popular in some country Ex. Iran, India, Bulgaria and Turkey and exported different products to other country. In the Middle East they extracted water and essences out of it and preserved in the form of rose water by an ancient method. In first time an Iranian scientist, Avicenna, is credited with the invention of the process for distillation in the early 11th century. So since that time all producers are used this method. The flowers are renowned for their fine fragrance, and are commercially harvested for rose oil used in perfumery and to make rose water, absolute and also "rose concrete". The flower petals are also sometimes used directly to flavor food or to make tea and are considered safe for human consumption. Chemical composition: Several components were isolated from flowers, petals and hips (seed-pot) of *R. damascena* including terpenes, glycosides, flavonoids, and anthocyanins (27-30). This plant contains carboxylic acid (31), myrcene (32), vitamin C (13), kaempferol and quercetin (33). Flowers also contain a bitter principle, tanning matter, fatty oil and organic acids. Loghmani-Khouzani *et al* (2007) found more than 95 macro- and micro-components in the essential oil of *R. damascena* from the Kashan regions of Iran. In another study, the composition of rose was phenyl ethylalcohol (72.73–73.80%), citrenellol (10.62–11.26%), nerol (2.42– 2.47%), and geraniol (5.58–5.65%). Steam distillation of plant materials such as flowers was also found to contain four constituents; geraniol was the major compound (30.74%) followed by citrenellol (29.44%), phenyl ethylalcohol (23.74%), and nerol (16.12%) (9, 35). The medicinal functions of Rosaceae are partly attributed to phenolics compound. Ethanolic extract of the flowering tops of *R. damascena* activity on CNS in mice are anticonvulsant, anti-depressant, antianxiety, analgesic effects.

Keywords: Steam distillation, phenolics compound, citrenellol, *Rosa damascena* Mill.



First Things First, A Negotiation Method

Dr. Fahimeh Robiolle

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There will not be a day when you don't negotiate. Negotiations are everywhere with your family, at your workplace, in the social and public arenas, at international levels. If used appropriately, it enables programs to achieve results, strengthen links, facilitate conflict resolution, and accelerate decision making. So mastering negotiation skill is at the heart of our personal and collective social harmony. Although no one is born a negotiator, it is possible to become a good one. Negotiation can be learnt.

Beyond intuitive practices, this approach proposes a way of negotiating that incorporates both general principles and a number of specific techniques are learned. It tries to go further than the win / win theory and help structuring of sequences of negotiations to ensure that you perform the essentials before the evidence: preparation before action, listening before speaking, creating value before splitting it and managing the emotions caused by problems before resolving the problems and so on.

Based on classical and contemporary theories, this presentation illustrates the way to do "right" at the "right" time, through training experiences, consulting and pragmatic advice. This will reduce the risk of deadlock and tensions; it will increase chances of success, and will make future negotiations more enjoyable.

Fahimeh Robiolle is a lecturer and conduct seminars and courses on negotiation, conflict resolution, leadership and management at Kabul University in Afghanistan, Tehran University Pardis of the Faculty of Engineering, French universities (Sorbonne, Cergy,...) and ESSEC French business school and at the other international levels.



***Rosa damascena* uses and Applications in French Cosmetics and in Perfumes**

The Rose: A Beautiful Active Raw Material

Dr. Valerie De Bourmont

Tabib daru Co. Scientific consultant, France

Rose is widely used in perfumery and cosmetics industry. We can find **the *Rosa damascena*** or *Rosa centifolia* in Marocco, Bulgaria and Iran. The best quality in perfumery industry is for me the *R. damascena*. The extracts used are both essential oil and absolute. The best qualities have Fruity notes (raspberry & lychee) and Powerful, rich, fresh, sweet characterizes a rose body. Clove like spiciness should be present in essential oil; we can find phenyl ethyl alcohol, citronellol, geraniol, eugenol. The quality depends on the citronellol rate. The absolute contains more phenyl ethyl alcohol. ROSE is not only a good fragrance but has also a big **efficiency on our emotional body** and on our skin. In Japan, 3 studies were conducted on students. The rose essential oil released for 40 minutes in the air. Their saliva was harvested before and after the experiment. The rate of cortisol decrease for the group with rose in the air. **Floral water** of rose is also very efficient in skin care product. The Composition is Glucid, Protid, Tanins, Flavonoid, Essential oil. Panel of 40 women using floral rose water while 28 days

- The skin is more glowing:87%
- Skin is soothing :81%
- Skin texture is unified :70%
- Pores are tightened :87%
- Regenerated :70%
- Tonified:95%
- perfect for all type of skin especially fragile and sensitive skin

The using of essentials oils in perfumes (active core with a care action). **PROPERTIES OF THE ROSE'S ESSENTIAL OIL:** Immunomodulator, immune system protection in a non-specific way against stress. Harmonizing effect on hormonal, cardiovascular and nervous system. Stimulates skin cell repair mechanism

Due to GERANIOL, LINALOL, CITRONELLOL

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Workshops



Making the most of what you have!

Prof. Dr. Ebrahim Naderali

Faculty of Science, Liverpool Hope University, Liverpool, UK.

Bringing a product to the market is a major challenge for a producer. There are numerous strong market forces posing significant challenges for a product to enter the market. For a novel product, initial market introduction and market acceptance is the major challenge, while for a second or third to the market, managing competition and market penetration has always been a major task. A well-planned, skilfully executed strategy is vital for successful product launch and market sustainability. This workshop will focus on identifying potential challenges, evaluating the risks and risk mitigation steps required for new and me-too products.



Question and answers in organic production.

Dr. Mohammad Bagher Bahardar

Davis University of California, USA

The workshop turned into a slide show of a sample organic farm and different aspects and activities in the farm such as soil improvement, insects and weed management and marketing.



Sustainable Use of Aromatic and Medicinal Plants and International Trade

Prof. Dr. Ibrahim BAKTIR

Cyprus International University

Faculty of Agricultural Sciences and Technologies, T.R.N.C.

Abstract: Turkey and Cyprus have rich biodiversity and considerable number of taxa. According to latest estimates Turkey has over 12 000 and Cyprus has about 1800 generic taxa. Each year new species or taxa are added to both flora. Endemism rate is quite rich in Turkey with 35% and moderate in Cyprus with 7%. In Turkey, more than 1000 species are used variously for medicinal and nearly 3000 taxa are believed to be used for aromatic purposes.

Except commercial crops such as poppy, anis, rose, fennel, cumin, coriander, dill and a few others are cultivated for medicinal and aromatic purposes in Turkey. The majority of exported herbs are gathered from wild sources. Coriander is the only one aromatic plant cultivated in Cyprus.

Even though, there is a well prepared guideline titled ‘‘Guidelines on the Conservation of Medicinal Plants by IUCN’’, wild collections of the listed plants are still not under strict control.

These are the main non-woody plant species and parts of the woody plants exported from Turkey: Oregano, laurel leaf, sage, saffron, linden flowers, licorice and gypsophila root. Saffrons are over-exploited and under serious threat. Artificial propagation of the wild collected species are inevitable practices for sustainability and also application of the guideline has vital importance.

Keywords: Aromatic and medicinal plants, Turkey, Cyprus



Optimization of effective variables on the quantity and quality extraction of essential oil from *Rosa damascene* Mill. and Iranian *Rosmarinus officinalis* L. using experimental design

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Experimental design is one of the basic and important techniques in optimization of influencing parameters in order to obtain the best results of a process. Experimental design helps us to find the answers of the following questions:

- 1- Does the input variable influence the response value, and if so, how?
- 2- Which inputs variables are the most influential on the output value?
- 3- How to set the inputs variables so that output value is always near optimal or target?
- 4- How to set the controllable influential variables so that influences of uncontrollable factors on the response value are minimized?

Central composite rotatable design (CCRD) as the most applicable methods of experimental design, was used for optimization of quantity (extraction yields as a response) and quality (Citronellol/ Geraniol ratio as a response) of *Rosa damascene* essential oil, that its benefits and applications in various industries such as pharmaceutical, cosmetics, perfumery and food be apparent for all from past to yet. In addition, it is possible to apply the CCRD in the optimization of effective variables for microwave assisted extraction (MAE) of *Rosmarinus officinalis* essential oil, quantitatively (via measuring of the extraction yields) and qualitatively (via determining of chemical composition of the extracted oil).



Making of Natural Skincare Products, Rose Face Cream

Dr. Mehrdad Omidsalari

National Union of Scientific Society of Medicinal Plant, Iran

In the herbal cream making workshop, an all herbal cream base, will be used. As well, by using purified vegetable oils, depending on the properties of each, more than ten types of creams will be used. It is worth noting that herbal creams are mostly curative. Creams such as whitening cream, rose flower oil are used in their formula.



Planting and Preserving of Potted and Medicinal Plants

Arezoo Hashemi

National Union of Scientific Society of Medicinal Plant, Iran.

Cultivation of dandelion plants in pots is a new project aimed at entrepreneurship in homes and workplaces. Planting pots is a very low-cost, yet high-yielding plant, and anyone in any situation can make a living. In this class, cultivation of 10 types of medicinal plants will be taught as transplant and seeds.



Equipment and Technologies of Processing the Medicine, Aromatic and Damask Rose Plants at Large Industrial Scale

Seyed Abdollah Hosseini

Bokhar Taghtir Co, Iran

Abstract

One the major problem to processing the medicine plants at industrial scale is how we choice the best and suitable technologies to do them. The choice of the best or better technology is belong to know different technologies, balance cost – profit and choice the suitable technology.

At this WORK SHOP, we discuss the common technologies with their weakness and advantages, so we present a large scale factory at 3 dimensions which contains:(aromatic water, Essential Oil, Aroma, Phenyl Ethyl, Concrete, Absolute, liquid extract , bulk, powder extract and utilities equipment)

Keywords: aromatic water, Essential Oil, Aroma, Phenyl Ethyl, Concrete, Absolute, liquid extract, bulk, powder extract and utilities equipment.



University of Kashan
Essential Oils Research Institute



Union of Iranian
Medicinal Plants Society



Rosa damascena 2019

The second International Conference & Workshops on *Rosa damascena*
13-15 November 2019, University of Kashan, Qamsar, Iran

General aspects
in medicinal &
aromatic plants

Abstract Submission Deadline: Wednesday, 25th September

Extended to: Tuesday, 15th October

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Technology

Products

Regulations

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Organizing Committee Head:
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