

Late spring frost has an important role on reducing yield and fruit quality of pistachio trees. The present research was done to evaluate effects of chilling temperatures on proline, total protein, sugars and nutritional elements of flower buds of pistachio trees. This study was conducted using a split-plot design with three replications where the main factor was three times of dormancy (winter), flowering (beginning of spring) and after spring frost and secondary factor was pistachio cultivars ('Ahmad-aghaee', 'Ouhadi', 'Kaleh-ghochi' and 'Akbari') which was done at Ferdowsi University of Mashhad and Institute of Pistachio Research of Iran (Rafsanjan). The Studied Variables included proline, total proteins, sugar and nutrient elements were assessed. The highest rates of proline (27.36 mg/g fresh weight of flower bud) and lowest (7.86 mg/g) were found in Ahmad-aghaee after chilling injury and bud swelling, respectively. The highest rate of total protein was shown by 'Akbari' (70.79%) and 'Ouhadi' (71.25%) at flower burst time, and the lowest amount was obtained at bud swelling time of 'Ouhadi' (25.39%) cultivar. Data showed the increment of nitrogen, potassium, zinc and iron contents of clusters, which illuminates the relationship between chilling resistance and nutrient elements.

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The Effect of the Flowering Time of Different Cultivars of Almond's Hard Shell on Its Seed's Dormancy Breaking Time and Germination

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Seed's dormancy is considered as one of the effective factors in seeds' germination and consequently in the growth of seeds of many herbal species. Shortening the dormancy period and enhancing the germination percentage in fruit types could be a valuable strategy for the seed researcher and plant nurseries. In this research the seeds of different hard shell almond cultivars (Sahand late-flowering, Touno middle-flowering cultivars, and Bomi1 early-flowering) were used. First, the seeds' samples were exposed to the running water for 24 to 28 hours. After that the seeds were kept in the wet perlite (to the extent of field capacity) at 4 to 6 °C for 15 weeks. Percentage of seeds germination was recorded during cold stratification once a week. The results showed that different treatments have significant effect on the decrease of the time of different cultivars' seed germination; in other words, on the decrease of the chilling requirement in them. In such a way that seeds of Touno middle-flowering, Sahand late-flowering and Bomi1 early-flowering cultivars have more growth rate and higher germination uniformity respectively.

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Detection of Aroma Compounds of Some Apricot Cultivars by Headspace Gas Chromatography Technique

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A study was aimed to detect aroma profile of 21 apricot genotypes such as Turfanda Eski Malatya, Karacabey, Paviot, Zerdali No.1, Aprikoz, Soğançı, Hasanbey, Levent, Royal, Şekerpare, Çataloğlu, Kabaşı, Stark Early Orange, Sakıt-3, Şam, Hacıhaliloğlu, İri Bitirgen, Casna Drenova, Çöloğlu, Ordubat, İmrahor which are grown Malatya provinces of Turkey. Aroma compounds of experimental varieties were separated, identified and quantified using Gas chromatography (GC) with mass spectrometry detection. Extraction was done automatically using headspace apparatus of GC/MS. According to the results aroma composition of apricot genotypes were ranged from genotype to genotype and local genotypes were detected having higher concentration in terms of identified aroma compounds.

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Nutritional Value and Health Care Functions of the Chinese Jujubes (*Ziziphus jujuba* Mill.) and the Wild Jujube Fruits (*Ziziphus spinosus* Hu.)

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The Chinese jujube (*Ziziphus jujuba* Mill.) and its wild species, acid jujube (*Ziziphus spinosus* Hu.) can provide not only a wealth of energy to the bodies, but also mineral elements and bioactive substances for health care functions. 1 Studies on nutrition and chemical composition 1.1 Carbohydrate: They have significant amounts of carbohydrates, primarily including glucose, fructose, sucrose, and oligosaccharide, Arab PG and galactal PG, a composite of glucose and fructose. 1.2 Protein and Amino acid: The crude protein content was 2.92% in dried Chinese jujube fruit and the Chinese jujube contains 16 kinds of amino acids in all. 1.3 Crude fiber 1.4 Vitamins and Carotin: Vitamin C in the fresh fruits of Chinese jujube and wild jujube is the most abundant, thus known as the "live vitamin C" and "Natural Vitamin pill". 1.5 Mineral elements: It showed that fresh jujube fruits contented 14mg Calcium, 23mg phosphorus, 0.5mg iron, 61mg calcium, 55mg phosphorus and 1.6mg iron. 1.6 cAMP and cGMP: The cAMP content was between 0.74-105.03µg/g and between 1.30-52.78µg/g in fresh Chinese wild jujube fruits. The cGMP was between 4.2-220.9µg/g in dried fruits. 1.7 Triterpenic acid and saponins: The major triterpenoid-type substance such as lupine type, betulinic acid, oleanolic acid and ursolic acid have been detected from Chinese jujube fruits. It demonstrated that the total saponins content was between 1.885-4.448mg/g, averaging 3.276mg/g.

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Evaluation of the Temperature Effect and Pectinolytic Enzyme Complex to Obtaining of Compounds Carotenoids from Bagasse Cashew Apple

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The apple cashew bagasse, byproduct of the juice industry, constitute a source of polyphenols and carotenoids, compounds of high added value in terms of their functional properties in food, beyond the dyeing power of carotenoids. The objective of this study was to evaluate the efficiency of maceration of pomace of cashew apple in temperatures of 30, 35 and 40 °C for one hour to obtain carotenoid compounds. The extract was obtained by sequential pressing bagasse with water at a ratio of 1:1 (residue: water), macerate for 1 hour at 30, 35 and 40 °C. A pectinolytic enzyme complex was added (500 ppm) the residue before the first pressing. The application of enzymes in the process showed an overall gain of 23%. Among the extracts obtained with pectinolytic enzymatic complex the highest levels of carotenoids were obtained at temperatures of 30, 40 and 35 °C, respectively.

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Influence of Maceration Time and Enzimatic Concentration to Obtaining of Carotenoids Compounds from Bagasse Cashew Apple Extract

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The cashew tree is a typical culture of the Brazilian northeast of great socio-economic importance. The cashew bagasse extract is a source of carotenoids, which can acquire high-value due to their use as natural dyes in foods, and antioxidant func-

tional properties. The objective of this study was to evaluate the influence of soaking time and pectinolytic enzyme concentration to obtain carotenoid compounds from cashew apple. To select the best time, enzyme concentration and pomace: water proportions for soaking, we used a temperature of 30 °C, the proportions of pomace: water (1:1 and 1:2, respectively), with concentrations of 250 ppm, 500 ppm of enzymes and the control group without enzymes, treated for one, two and three hours. The extract was obtained by sequential pressing with water at a ratio of 1:1 (residue: water) homogenized for one and two hours in temperatures of 30 °C. To obtain the extract with pectinolytic enzyme complex, was added 500 ppm of enzymes before the first pressing. The best conditions of enzyme concentration and residue: water proportion were the addition of 500 ppm of pectinolytic enzyme complex in aqueous solution and soaking in a 1:1 ratio. All extracts macerated for an hour, with and without addition of enzymes showed higher levels of carotenoids than extracts macerated for two hours at 30 °C.

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A Polygalacturonan Isolated from the Fruits of Chinese Jujube and Its Effect on the Proliferation of Cultured Lymphocytes

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A purified polysaccharide JuBP-2 was isolated from the water extract of the fruit of Chinese jujube (*Ziziphus jujuba* Mill.), an important traditional Chinese medicinal and fruit tree. Chemical and spectroscopic analyses indicated that JuBP-2 is a highly branched polygalacturonan interspersed with rhamnolacturonan in the main chain. JuBP-2 had a molecular mass of 1600 000Da with $[\alpha]_{20D}+154(c=1.05, H_2O)$. It was composed of rhamnose, arabinose, glucose, galactose and galacturonic acid in a molar ratio of 1:8.83:2.08:7.44:33.79. The main backbone chain in JuBP-2 was mostly composed with (1→4)-linked α -D-GalA interspersed with 1,2-linked α -L-Rha and the side chains were attached to the backbone at the O-4 position of rhamnose residues. Arabinose, glucose and galactose were in the side chains. Arabinose was present in the furanose form. Most Araf (67.75%) is 1,5-linked and the rest is 1,3,5-linked. Galactose was present in the pyranose form and predominantly 1,6-linked in the complex. In addition, 1,3,6-linked and some terminal-linked Galp were also detected. Glucose was present in the pyranose form and terminal-linked. JuBP-2 showed an effect of stimulating the immune response, which when applied onto the cultured rat lymphocytes induced the cell proliferation in a dose-dependent manner.

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Metabolic Characterization of *Prunus cerasus* L. and *Prunus mahaleb* L. Fruits

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It is widely accepted that a diet rich in fruits and vegetables reduces the risk of several oxidative stress diseases, including coronary heart disease, cancer and stroke. These health benefits are ascribed to phytochemicals such as carotenoids and polyphenolics. In the search for antioxidative chemicals from native fruits of the Puglia region of Italy, *Prunus cerasus* L., an acidic cherry widely used for culinary purposes, and *Prunus mahaleb* L., a tree species commonly used as rootstock in cherry crop, have been studied. The *P. mahaleb* fruits have a high content of organic acids, fructose and vitamin C, but are not consumed fresh because of a bitter and sour taste. In this work we obtained the 1H NMR spectra of the two species and from the comparison of these spectra, we found that *P. mahaleb* fruits have a higher concentration of phenolic compounds, such as flavonoids, and organic acids, in comparison to *P. cerasus* fruits. The same results were obtained when we focused on anthocyanins. In this study we identified the signals of anthocyanin protons in

1H NMR spectra of a mixture of compounds in aqueous extracts of both *P. cerasus* and *P. mahaleb* fruits but the latter species showed a higher concentration and a larger number of these compounds. This metabolomic analysis gave us the data to scientifically revalue traditionally-used plants like *P. mahaleb* and to identify the potential as source of biofunctional compounds to be used in food and/or pharmaceutical industry. Moreover in this study, NMR spectroscopy coupled with multivariate data analysis was applied to *Prunus* metabolomics in order to investigate the botanical origins of *Prunus cerasus* and to identify the compounds responsible for differentiation of these two species of *Prunus* (*cerasus* and *mahaleb*) and of two cultivars of *Prunus cerasus* (Montmorency and Marasca di Zara).

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Determination of Fig Fruit Extracts (*Ficus carica*) Antioxidant Properties

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The fig tree (*Ficus carica* L., Moraceae) is very common in the Mediterranean and in countries with dry and warm-temperate climate. Since ancient times the figs have been used only for human consumption. Their nutritive and pharmacological properties have been investigated recently. Their consumption helps in the prevention of vein blockage, high content in fibers has laxative effects, and the fig latex inhibits the growth of carcinoma cells.

The aim of this study was to determine a content of some active components contained in extracts of five different figs cultivars (Šaraguja, Termenjača, Crnica, Bjelica and Bružetka bijela). Samples were freeze-dried fig fruits. Extracts were obtained by 70% methanol or ethanol. Analysis of fig extracts included determination of total phenols and flavonoids, as it was determined that a broad of pharmacological effects have been derived from the content of this compounds. For determination of antioxidant activity, scavenging capacity on DPPH* radicals and reducing power were performed. By high performance liquid chromatography (HPLC) some antioxidant compounds were detected and quantified. Total phenolics content in *F. carica* extracts was from 7.24 to 11.17 mg CAE/g of dry extract. All methanolic extracts showed higher content of total phenols. The DPPH radical scavenging capacity was found to exhibit IC50 value for the extract concentration lower than 0.40 mg/ml for extract cultivars Crnica, while for others this capacity was higher than 0.60 mg/ml. Using reducing power antioxidant test higher antioxidant activity for Bjelica than all other extracts was determined. Results obtained by reducing power method were compared to activity of ascorbic acid, standard antioxidant compound.

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Evaluation of Pomological and Biochemical Traits Affecting Fruit Quality in a Nectarine [*Prunus persica* (L.) Batsch] Progeny

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Quality evaluation of fruit has become a very important issue in the fruit industry. In addition, epidemiological studies suggest that consumption of fruit rich in phenolic compounds is associated with health-protective effects due to the antioxidant properties of these components. In order to identify genotypes with good organoleptic properties and antioxidant-rich content, samples of flesh fruit from a F1 population derived from the cross 'Venus' x 'Big Top' nectarines were studied. Total polyphenols, flavonoids, anthocyanins, L-ascorbic acid, sugar contents and the relative antioxidant capacity (RAC) were analyzed. Agronomical traits such as tree yield (kg/tree), fruit weight (g) and the analysis of fruit quality parameters [firmness, soluble solids content (SSC), pH, titratable acidity (TA) and ripening index (RI=SSC/TA)], as well as pomological traits (fruit type, date of bloom and