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Identification of Compounds Existent in Essence of *Syzygium aromaticum*

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Abstract

Syzygium aromaticum is one of the important plant sources of Phenol and anti-oxidation compounds, anti-cancer and anti-pain, which has been used since long. Essence of *Syzygium aromaticum* was extracted and chemically analyzed considering the importance of essences and their applications in different industries due to their exclusive characteristics; this was done to identify and evaluate chemical compounds of essence. Extraction was made by maceration method and essence was extracted by use of Clevenger apparatus. The extracted essence and extract had been analyzed by use of gas chromatography linked to mass spectroscopy (GC/MS). Eight chemical compounds had been identified in extracts of *Syzygium aromaticum*, the main compounds of which contained Eugenol (85.5%), Eugenol Acetate (3.2%) and Heptacosane (1.8%). Seven chemical compounds had been identified in essence of *Syzygium aromaticum*, most basic of which included Eugenol (86.36%) and beta caryophyllene (7.66%). Eugenol was the main compound in both essence and extract and showed the most density of the compound among them.

Keywords: Essence, Extract, *Syzygium aromaticum*.

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PCR-DGGE: A Modern Method in the World of Microbiology

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Abstract

PCR-DGGE is one of the modern molecular methods that was first innovated to explore DNA polymorphism. This technique breaks apart the same size DNA parts based on successive discrepancy. Currently, this technique is being applied in different fields of microbiology such as medical microbiology, nutrition microbiology and industrial microbiology. In this technique, after DNA is taken from the sample concerned, DNA is reproduced with the help of universal primers through PCR. Later, PCR product which contains the same size DNA parts is being placed on the DGGE gel that contains a grade of naturation substances (Urea and Formamide) and electrophoresis is done. DGGE separates DNA of different bacteria that can be used for the next analyses. Although some limitations like the one in the succession size used, PCR-DGGE can be applied as an efficient and quick technique for lots of goals in microbiology. In this paper, while briefly introducing the technique, its advantages and limitations are studied in microbiological researches.

Keywords: Microbiology, Molecular methods, PCR-DGGE.



Determining the Absorbed Dose in Relation to Liver Tissue in Neutron-operated Radiotherapy

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Abstract

In this article, one liver tissue along with soft tissues on its front (like fat and skin) have been analyzed in their ingredients and later, they are radiated by neutron in radiotherapy operation. This study can be applied for all liver tissues particularly for curing cancer. The amounts of absorbed dose in one liver tissue have been determined as a result of contact between neutrons with the ingredients of liver tissue. In this sectional-descriptive study, liver tissue has been placed under neutron radiation and amounts of absorbed dose or energy absorbed were obtained in each of the liver tissue ingredients. The results had been analyzed through descriptive statistics by means of Excelv2010 and SPSSv16. The findings indicate that if the existing compounds in liver tissue, fat and skin are broken up in their ingredients like hydrogen, oxygen, carbon, nitrogen, sulfur and sodium, the amounts of absorbed dose in relation to liver tissue ingredients, fat and skin each of which has different mass figures; most of the dose amounts absorbed happen to hydrogen and because of their abundance.

Keywords: Absorbed dose, Liver tissue, Neutron, Radiotherapy.

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Study and Evaluation of Compounds Rate of Phenolic and Polyphenolic Acids of some *Capsicum annum* L. by High-efficiency Liquid Chromatography Method

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Abstract

Capsicum is a bush-like tree belonging to Solanaceae that has since long been used because of its effects of reduction of glucose and blood pressure in Iran's traditional medicine. The most important compounds of capsicum are made up of Phenols particularly Antosianin in methanol extract of capsicum. Capsicum had been collected from Isfahan and Turkey in 1392 (2013) and preserved at -80 degrees of centigrade until metabolites concerned were measured. Next, the concerned compounds of capsicum had been prepared by use of methanol acid and phenolic compounds and anti-oxidation properties were measured by high-efficiency liquid chromatography method (HPLC). Examination of methanol extracts of the regions showed that most phenolic compounds related to coumaric acid (1.89mg/mg of extract) were observed in green long capsicum of Turkey and had been of synaptic acid related to capsicums of Shahr Reza of Isfahan; capsicums of Isfahan enjoy better anti-oxidation activity than those of Turkey.

Keywords: *Capsicum annum* L, HPLC, Phenolic compounds.



Comparison of Risk Factors and Anterior Cruciate Ligament Reconstruction in Athlete Men and Women

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Abstract

As number of athletes rise and, as a result, increased damage of Anterior Cruciate Ligament (ACL) in females, lots of studies have dealt with risk factors and damage treatment. Data banks like pubmed, scopus, Cochran, Elsevier and google scholar have been searched for the existing articles and studies conducted on Anterior Cruciate Ligament damage and the epidemic damage was studied in athletes; in this case, ACL damage, risk factors and the current treatments for the damage in athletes have been identified. Based on a new research in the data banks on Esfand, 1395 (2016), a number of 79 articles have been discovered in this regard. 18 out of 79 articles have been confirmed in which risk factors and the effect of different treatments on damaged Anterior Cruciate Ligament in males and females have been examined. The results showed that ACL damage remains prevalent in athletes the differential cause of which is muscular-nervous compatibilities with biomechanics along with techniques of landing including: knees, Valgus stress resulting in displaced Tibia anterior.

Keywords: Cruciate ligament reconstruction, Knee joint, Knee ligament damages, Knee.



Studying the Effect of Silver Nanoparticles on the Gram Negative Bacillia Bacteria causing Urinal Infections Resistant to Multiple Antibiotics (MDR)

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Abstract

One of the important problems in human health is resistance of pathological bacteria including bacteria causing urinal infections to anti-bacterial substances. This problem leads to increased treatment costs, increased treatment cases and final death of patients. This paper aims to identify gram negative bacillia bacteria causing urinal infection resistant to several antibiotics and study of effect of silver nanoparticles on them. During 6 months of the year 1395 (2016), a total of 150 urinal infection-causing gram negative bacillia bacteria were separated from cultured 340 clinical samples from the patients who stopped by two hospitals of Fatemiya and Be'athat. For determination of antibiotic resistance of such bacteria, diffusion disc method was applied and their sensitivity rate was checked according to table CLSI. The separated gram negative bacillia bacteria were affected by densities of 50, 100, 200, 400, 800ppm of silver nanoparticles prepared from U.S Serva Company and their non-growth areola thickness was measured. The most common bacteria separated was Escherichia Coli and proteus vulgaris was less found. All samples showed sensitivity to silver nanoparticles soluble at 100ppm and 200ppm density. Pseudomonas aeruginosa (30mm) and enterobacter aerogenes (27mm) showed the highest thickness of areola at the presence of silver nanoparticle density of 800ppm. The findings show silver nanoparticles can put harness effect on all under-experiment gram negative bacillia bacteria and with the increase of silver nanoparticles density, non-growth areola thickness of urinal infection causing gram negative bacillia bacteria resistant to several antibiotics also increases.

Keywords: Antibiotic resistance, Gram negative bacillia bacteria, Hamadan, Silver nanoparticles, Urinal infection.