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The Study of Effect of Iran's Indigenous Probiotics on Dermatophytosis Resulting from *Microsporum Canis* in Wistar Male Rat under Lab Environment

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Abstract

Probiotics are living microorganisms that usefully affect the host and they are often used as food or medicine complements. Nowadays, probiotic products are widely known in the world and they possess the functional qualities such as strengthening the immunity system, reduced serum cholesterol, reduced enteric infections and reduced probability of cancer contraction, reduced skin allergies and so forth. Skin fungus diseases are infections that are caused by the attack of various species of dermatophytes on epiderm of human or animal skin, striking cretin-bearing tissues of skin and its appendices that cause infections with weak/strong clinical symptoms. In this research article, by using histopathology and examination of probiotics function on the *microsporum Canis* fungus, their effect has been studied. For conducting the test, suitable probiotics is firstly picked under lab conditions and further 40 wistar male rats with the same weight and age were randomly subdivided into five positive and negative control groups and three experimental groups under standard lab environment, treatment trend of which through oral intake (gavage) after contamination and applying salve after reaching maximum contamination have been checked where living probiotic strains increase resistance of epithelial cells and facilitate phosphorylation of cytoskeleton proteins and strong joints in HT-29 and Caco-2 cells. Besides, they impregnate angiogenesis probiotics metabolites, cause proteoglycans to be accumulated and regenerate wounds. Probiotics have antimicrobial mechanism including antimicrobial peptide secretion, control over bacteria attack and control of pathogen bacteria viscosity to epithelial cells which prevent from infections of the wounds; as a result, this would be positive effect of probiotics on *microsporum Canis* fungus.

Keywords: Dermatophytosis, *Microsporum Canis*, Probiotics.

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The Analytic Study of Essence and anti-oxidation Properties of Medicinal Herb Seed of *Foeniculum vulgare* before and after Cryopreservation

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Abstract

Introduction: Cryopreservation is a terminology that refers to preservation of cells and tissues in liquid nitrogen temperature of -196 °C. At this temperature, cells enter at resting stage and biochemical and physical reactions practically stop. Under these certain conditions, protection time is unlimited. Cryopreservation of seeds is the most effective way for protection of gens pool of plants. Low costs of cryopreservation and regeneration of plant in its entirety from complete genome lead to specific advantages for seed cryopreservation compared with other plant tissues.

Materials and methods: Medicinal herb seeds of *Foeniculum vulgare* were exposed to desiccation by using pretreatment of temperature reduction and were preserved in liquid nitrogen within one week. Later, seeds were exposed to thermal shock. Desiccated and primed seeds after being cultured were transferred to germinator at 24 °C and light regimen of 16.8. Essence was extracted through water distillation by Clevenger apparatus and the existing compounds of essence were examined by GC/MS. Anti-oxidation effects of seed hydro-alcoholic extract were also checked by DPPH.

Results: Living percentage in primed seeds is observed 83% and in desiccation, seed reduced stood at 53%. The most essential existing compound in essence related to Anthul was recognized 78.6% which showed no meaningful difference compared to desiccated samples of anthul 80.04%. The results showed that seed cryopreservation has no negative effect on anti-oxidation properties and their essence compounds.

Keywords: Antioxidant, Cryopreservation, Essence, *Foeniculum vulgare*.



Determination of Antibiotic Resistance Pattern in various Serotypes of Klebsiella Pneumonia Separated from Hospital Infections in the City of Zarrinshahr

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Abstract

Background and Purpose: Klebsiella Pneumoniae stands as one of the most common gram negative bacteria in producing hospital infections, particularly urinary system infections, which, in recent years, has shown resistance to most antibiotics due to unusual consumption of antibiotics for treating livestock and human diseases. This article aims to determine antibiotic resistance pattern in the most prevalent capsule types of this bacteria in the town of Zarrinshahr of Isfahan province.

Materials and Methods: Klebsiella Pneumoniae strain separated from urinary infections in the hospitalized patients in different wards of Zarrinshahr hospital during summer 1395(2016) until summer 1396 (2017) had been picked and antibiotic resistance pattern in strains was determined by use of diffusion disc method (Kirby-Bauer) in accordance with CLSI standard on Mueller-Hinton culture environment in relation to 13 antibiotics after phenotypes and genotypes and specifying capsule types in them. Abundance of coding genes of antibiotic resistance including genes of tetA, cmlA, Catl, blaSHV, sull, aac(3)-IV, aadA1, qnr and CITM, dfrA1, tetB was shown in strains by application of PCR.

Results and Conclusion: K₂ type with 51.74% of abundance was recognized as the most prevalent capsule serotype in strains. All under-study strains had multi-folded antibiotic resistance. In addition to penicillin, they had the most antibiotic resistance than tetracycline (93.10%) and the least level of resistance belonged to chloramphenicol (3.44%). Genes of tetA and sull had abundance of 75.86% and 72.41% respectively as the most common genes and catl and cmlA had abundance of 6.89% and 10.34% respectively as the rarest coding genes of antibiotic resistance in strains of Klebsiella Pneumoniae taken from urinary system infections.

Keywords: Antibiotic Resistance, Capsule Types, Klebsiella Pneumoniae, Urinary System Infection, Zarrinshahr.

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Measuring the Amount of Heavy Metals of Lead, Cadmium and Arsenic in Imported Rice extensively used in the Town of Dezful

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Abstract

Heavy metals contamination is of an importance as one of the important problems of environment and concerns about foodstuff hygiene in the world, particularly concern about rice contamination which is one of the most fundamental foodstuffs in the diet regime of people of the world, including Asian nations and the second extensively used food among Iranians. This research paper was conducted in 1395 (2016) with an aim to study density of heavy metals of Cadmium, Lead and Arsenic in ten types of extensively used imported rice in Dezful town. After procuring and preparing three samplings of each of rice types from Dezful town bazaar, acidic digestion of samples and reading the aggregated density of Lead, Cadmium and Arsenic in them respectively was being done by atomic absorption system and Arsenic-meter. The data obtained were analyzed through MSTAT-C software and by use of totally random experiment in three repetition times. Means were compared through Duncan's multiple range test (MRT) at the probability level of 5%. In this study, density means of Cadmium, Lead and Arsenic in all rice samples stood at 1.063 ± 0.012 , 31.1 ± 1.04 and 124.5 ± 3.43 microgram/kg respectively. The variance analysis results showed that there was meaningful difference between under-study rice samples with 1% probability level of Cadmium, Lead and Arsenic. Means comparison results indicated that rice samples No. 5, 2 and 2 had most amounts of Cadmium, Lead and Arsenic of 1.36, 58.5 and 146 microgram/kg respectively; the least amounts with 0.93, 15.8 and 95 microgram/kg belonged to rice samples Nos. (9, 10), 8 and 10. This proved that Cadmium and Lead amounts in under-study rice samples stood less than standard and Arsenic amount in rice samples Nos. 1, 2, 3, 4, 5 and 6 stood more than standard authorized by Food and Medicine Organization.

Keywords: Arsenic, Atomic Absorption, Cadmium, Heavy Metals, Lead, Rice.

ZnO Nanoparticles Green Synthesis by Using Apple and Study of its Antimicrobial Effects

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Abstract

In this article, ZnO nanoparticles were synthesized by use of apple extract. Afterwards, chemical and physical properties of ZnO nanoparticles were studied by using SEM, XRD, EDS, UV-Vis and FT-IR. Average size of ZnO nanoparticles was estimated to be 10 nanometer by using Debye Scherrer equation. Synthesized nanoparticles under this method (apple extract) showed good antimicrobial property against *Candida albicans* where the halo diameter made by the sample concerned in this fungus was observed to be 26mm. XRD spectrum represents production of ZnO nanoparticles and matched with the previous reports. Based on SEM spectrum, it can be said that ZnO produced contain uniform particles. Regarding the results obtained from EDS test, presence of Zn has been approved in synthesized nanoparticles by means of apple extract.

Keywords: Antimicrobial Property, Apple Extract, ZnO Nanoparticles.



Stabilization of Laccase Enzyme by Use of Nafion and Carbon Nanotubes in Biocathode biofuel Cells and Biosensors

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Abstract

Nowadays, there is a growing demand for clean energy. Biofuel cell can convert chemical energy into electric energy. There are different biofuel cells designed that can use biocatalysts, enzymes and even microorganisms with an aim to produce electric energy. Biofuel cells are economical, compact and flexible enzymes. Enzyme biofuel cells basically transfer electron from enzyme to electrode and vice versa. Direct transfer of laccase enzyme electron was studied by fabrication of electrode through use of nafion polymer and multi-walled carbon nanotubes. Laccase was captured by nafion polymer and it is non-ionic as nafion polymer plays the role of transferring proton ion; as a result, multi-walled carbon nanotubes were used to facilitate electron transfer. Cyclic voltammogram results showed a peak with a maximum flow rate of 170 μA in a 10 μm solution of odnizidine as a polyfoam substrate and multi-walled carbon nanotubes. Also, the biocathode cyclic voltammogram showed that the stabilization of the laccase enzyme was effective using nafion and multi-walled carbon nanotubes and nanotubes. Therefore, this method can be used to make biomass biofuel cells and biosensors.

Keywords: Biocathode, Biofuel Cell, Multi-walled Carbon Nanotubes, Nafion, Stabilization of Laccase Enzyme.



Isolation and Molecular Identification of Enterococci and Investigation of the Presence of Cytolysin Pathogen Gene (cyl) from Urine Specimens

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Abstract

Background and Purpose: Enterococci are one of the most important factors in hospital infections. Enterococcus genus has 38 species, the most important of which are Enterococcus faecalis and Enterococcus faecium. Enterococci are important for bacteremia, urinary tract infections, Endocarditis, Meningitis and wound infections.

Materials and method: 280 specimens collected from medical diagnostic laboratories in Tehran were used. In order to isolate and identify the bacteria, agar-agar culture medium and the specific environment of kanamycin scolin azide agar were used and then the colonies of bacteria were identified by biochemical methods. The molecular confirmation of bacteria was also carried out by a specific molecular kit of enterococci. Finally, the presence of the Cytolysin gene in isolates was measured by PCR method.

Results: Of 280 samples examined, 50 samples (17.8%) were identified for Enterococcus faecalis species. Cytolysin presence in 34% of isolates was confirmed by PCR.

Conclusion: The results show that dissemination of enterococci containing pathogenic genes among patients with urinary tract infection can be dangerous for their health. These results show more attention to individual health.

Keywords: Cytolysin, Enterococcus faecalis, Urinary tract infection, Virulence genes.

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Comparing the low birth weight of newborn in the fasting pregnant with non-fasting pregnant women

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Abstract

Introduction: Maternal nutrition plays a critical role in fetal growth and development. Mothers practice fasting though they are excused from fasting during pregnancy. The aim of this study was comparison the low birth weight in fasting and non-fasting pregnant women.

Method: The present research was cohort study. 84 pregnant women were put into 2 groups of second Trimester (21 fasting pregnant women and 21 non –fasting pregnant women) and third Trimester (21 fasting pregnant women and 21 non – fasting pregnant women) sampling was performed randomly, gradually. Data was collected by questionnaires, examination, and interview, and then they were analyzed by SPSS.

Results: The statistical test showed that the difference in low birth weight between the infants of fasting and non-fasting women in the second trimester and third trimester of pregnancy was not statistically significant. Fasting in the second and third trimester of pregnancy does not lead to low birth weight if pregnant women have adequate meal.

Keywords: Fasting, Low birth weight, Pregnancy.

