Aantibacterial Effect of Tragopogon graminifolius Extract on Staphylococcus epidermidis, Bacillus subtilis, Escherichia coli and Salmonella typhi “in vitro”

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Abstract

Background and objective: Sheng (Tragopogon graminifolius) is belongs to the Asteraceae family. In traditional medicine, Sheng is used to treat gastric ulcers, liver dysfunctions, preventing bleeding, pulmonary infections, and wound healing. In this study the antibacterial effect of Sheng extract on Staphylococcus epidermidis, Bacillus subtilis, Escherichia coli and Salmonella typhi was evaluated in laboratory conditions.
Materials and method: In this experimental study, antimicrobial activity of Sheng extract on Staphylococcus epidermidis, Bacillus subtilis, Escherichia coli and Salmonella typhi was evaluated by disc diffusion agar and well diffusion agar (diameter of the inhibition zone) methods. Minimum inhibitory concentration (broth microdilution and Triphenyl tetrazolium chloride reagent) and minimum bactericidal concentration (pure plate) of Sheng extract were determined and reported.
Results: The results showed that the zone of inhibition diameters increased with increasing concentrations of the extract of Sheng. The highest zone of inhibition (22mm) by well diffusion agar method was related to Staphylococcus epidermidis. The minimum inhibitory concentration of aqueous extract of Sheng for Staphylococcus epidermidis, Bacillus subtilis, Salmonella typhi and Escherichia coli was obtained 64, 256, 256, and 256, respectively.
Conclusion: Sheng extract had an appropriate antibacterial effect on the strains studied. It is recommended that further studies be conducted in vitro and in vivo to use this plant to treat infectious diseases and control the growth of pathogenic microorganisms.

Key words: Sheng plant, Pathogenic bacteria, Extraction, Antimicrobial effect

Microbiological quality of street vended fruit juices from Yazd, IRAN, 2017

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Abstract

Background and objective: Trachyspermum capticum plant is from Apiaceafamily of essential oil and seed extract of this plant contain compounds that show its biological properties. The aim of this study was to investigate and compare the antimicrobial activity of essential oil and methanolic extract of herbs.
Materials and methods: The chemical compounds of this medicinal plant were analyzedby GC-MS and 7 components were identified, representing 85% of its total essential mass. The antibacterial properties of these agents were evaluated by determining the minimum inhibitory concentration (MIC) and minimum inhibitory concentration (MBC) against E. coli and Enterococcus faecalis bacteria with microdillution method, and the functional groups of the compounds were investigated using FTIR analysis.
Result: Results showed that the EO Trachyspermum capticum was formed by the main components of (Thymol 30%), (Limonene 21%) and (gamma-terpinene 19%). Factor groups derived from the resulting curves indicate that the flavonoid compounds in the extract have been shown to have antioxidant and antimicrobial properties. The results for the methanolic extract (MIC) were 15.62 mg/ml against enterococcus faecalis bacterium and 31.25 mg/ml against E.coli and MBC 125 mg/ml against enterococcus faecalis and 5.62 mg/ml is obtained against Escherichia coli bacteria. MIC and MBC of this species were found against Enterococcus faecalis 5 mg / ml bacteria and against E. coli (0.625mg/ml).
Conclusion: Essential oils and its methanolic extract play an important role in antimicrobial activity and its essential oil is much stronger than its extract. The presence of flavonoids in this plant is due to this biological property.

Keywords: Fruit juices, Contamination, coliform, E. coli, Microbiological quality standards

Effect of Inhalation of Penicillium conidia on Worsening the Allergic Asthma in Murine Model

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Abstract

Background and objective: Modern lifestyle of societies, and living in small houses or apartments, make the allergen-sensitive individuals to be predisposed to allergic asthma following challenge with environmental allergens such as fungal spores. The air-borne fungal conidia can be a major contributor to allergic asthma in children. Therefore, in this study, we aimed to study the effect of exposure to fungal conidia on asthma in an animal model.
Materials and methods: Twenty-four Balb/C mice were divided into four groups (n=6) as followings: the asthmatic mice, the asthmatic and fungal spore (*Penicillium chrysogenum*)-exposed mice, the asthmatic and spore-exposed mice that is also treated with an antifungal drug (nystatin) and the healthy mice (PBS-treated mice). After the last administration on the day 31, bronchoalveolar lavage (BAL) fluid and tissue samples of lung were obtained. The gene expression of interleukin 4, 5 and 13 and pathologic changes in lung tissue of mice were investigated.
Results: The mRNA expression of the interleukin genes, perivascular and peribronchial inflammation, mucus secretion and goblet cells hyperplasia were increased in asthmatic mice that is also exposed to fungal spores in comparison to the asthmatic but not spore-exposed mice. Nystatin treatment in asthmatic and spore-exposed mice caused notable decrease in pathologic changes in lung tissue and mRNA expression of IL-4, 5 and 13.
Conclusion: Antifungal treatment is recommended in asthmatic patients that also have high chance to be exposed to fungal spores. The results indicated that fungal spores are potential stimulators of allergic asthma so it is suggested that allergen-sensitive patients particularly children and those with the allergy history avoid any exposure with air-borne fungal spores.

Keywords: Allergy, Asthma, Fungi, Fungal spores, Penicillium

Production of Silver Nanoparticles using *Bacillus licheniformis* Biofilm by Rotating Biological Contactor and their Antibacterial Activity

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Abstract

Background and objective: Nanoparticles show unique and considerably changed chemical, physical, and biological properties compared to bulk of the same chemical composition, due to their high surface-to-volume ratio. Biological synthesis of silver nanoparticles using microorganisms has received profound interest because of their potential to synthesize nanoparticles of various size, shape and morphology .

Materials and methods: Isolates were collected from the different area of agriculture soils of Kerman. For the identification and characterization of the culture, done morphological (colony color, shape and size) and biochemical tests. Cultures supernatants and bacterial wet biomass were mixed with AgNo3. Then the mixtures were kept on a rotating shaker at room temperature for a period of 24-48 h under dark and visible light illumination. Rotating biological contactor were used for biosynthesis of silver nanoparticles (AgNPs). Synthesis of AgNPs was initially observed by color change from greenish yellow to brown and were characterized by UV-Vis spectroscopy. The particle of silver nanoparticles was studied by Transmission Electron Microscopy (TEM). The antimicrobial activity of the AgNPs was investigated using Escherichia coli, Pseudomonas aeruginosa, and Staphylococcus aureus, by applying well diffusion method.

Results: UV-vis spectrum of the aqueous medium containing silver ion showed a peak at 420 nm corresponding to the plasmon absorbance of AgNPs. TEM micrograph showed formation of the AgNPs in the range of 2 nm−100 nm and the morphology of them is spherical. The silver nanoparticles exhibited higher antibacterial activity against Gram positive than Gram-negative bacteria.

Conclusions: The synthesized AgNPs was produced by Bacillus licheniformis have a great biomedical application and represent a future for more therapeutic and pharmacological applications.

Keywords: Bacillus licheniformis, Silver nanoparticles, Antibacterial activity, Rotating biological contactor

Epidemiology of High-risk Behaviors for HIV/ADIS in the Social Network of Men Aged 18 to 45 in Jahrom city. 2017

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Abstract

Background and objective: High- risk behaviors are one of the most significant social damages of today's societies that seriously endanger the physical, social and psychological health of humans. This study was conducted with the aim epidemiologic study of high-risk behaviors for HIV / ADIS in the social network of men aged 18 to 45 in Jahrom city.
Materials and methods: The present study was carried out on 500 men aged 18-45 years and seven population groups were defined as opium users, unknown drug users, alcohol users, injection drug users, male who have extra-marital sex with females (MSF), male who have sex with female sex workers (MFSW) and male who have sex with other males (MSMs). People were asked whether they knew a person from the above groups in their social network, and if yes, how many people do they know.
Results : In the social network of men participating in the current study, the prevalence of alcohol users, opium users, male who have extra-marital sex with females (MSF), male who have sex with female sex workers (MFSW), unknown drug users injection drug and male who have sex with other males (MSMs) 90.2%, 81%, 70.2%, 66.8%, 64%, 23%, and 3.6% respectively.
Conclusion: The prevalence of alcohol users, opium users and male who have extra-marital sex with females were higher than those in other high-risk groups in men's social network. This finding can indirectly indicate higher in the frequency of these groups in the male population of the region under study. Therefore, it is necessary to develop special educational programs and prevention of HIV / ADIS.

Keywords : Social network, High- risk behaviors, Men, ADIS

Zoonotic Parasites in Slaughtered Animals of Sanadaj Slaughterhouse

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Abstract

Background and objective: Zoonotic parasites are a broad range of diseases Which are of great health and economic importance. The purpose of this study was to identify the Zoonotic diseases in slaughtered animals in Sanadaj slaughterhouse.

Material and method: This cross sectional study was done on gastrointestinal tract 273 slaughtered animals including 164 sheep, 45 and 64 gastrointestinal tract of sheep, goats and cattle were collected, respectively, and transferred to the laboratory of Parasitology. Data analysis was done by SPSS software.

Results: Results showed that the prevalence of gastrointestinal parasites of sheep, goats and cattle were 29%, 38% and 8%, respectively. The prevalence of fasciola in the liver of sheep, goats and cattle were 5.49%, 4.4% and 25.6%, respectively. The prevalence of dicrocelium of liver: 3.05%, 2.2% and 3.1%, the prevalence of lung worms in sheep and goats were 8.54% and 4.4%, respectively, but there was no pulmonary infection in cattle. The prevalence of hydatic cyst in the liver of sheep, goats and cattle were 6.25%, 2.2%, 4.27%, the prevalence of hydatic cyst in lung were 7.32%, 11.11%, 9.37%, respectively. In this study, 19 parasite species from sheep (12 nematodes, 4 cestodes, 3 trematodes), 11 parasite species from goats (7 nematodes, 2 cestodes, 2 trematodes), 7 parasite species from cattle (3 nematodes, 1 cestode, 3 trematodes) were isolated.

Conclusion: According to our results, there is a high prevalence of Zoonotic parasites in Sanandaj livestock animals. Which, in addition to imposing economic losses and health risks for the human, Increases the need for wider health measures to control diseases

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Keywords: Zoonotic parasites, Alimentary tract, Lung, Liver, Slaughterhouse

Survey of Effectiveness of Stray Animals' Killing on Animal Bites Incidence Rate

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Abstract

Background and objectives: In recent years, cases of animal bites have increased in Iran. In addition, stray animals killing had upward trend, accordingly. The incidence rate of animal bites in Fereydunshahr is higher than the national average (499 vs. 188 per 100,000) and it has great importance in this regard. Therefore killing of stray animals has constantly been the agenda of the relevant organs with a high cost, but does this program reduces the rates of animal bite? This study evaluated effectiveness of stray animals' Killing on animal bites incidence in Fereydunshahr (Isfahan, IRAN) in the last 18 years (2000-17).

Materials and methods: In this routine data base study, we followed 2339 cases of animal bites (using CENSUS method) that had been diagnosed and received Anti-Rabies vaccine during the studied period, as well as 2642 cases of animal waste. The data used in this study were collected from the township health center reports. Statistical computing was performed using SPSS software (ver. 19) at an error level of 5%.

Results: Pearson's Skewness coefficient showed that both the number of animal bites, also, killed animals have normal distribution. Given the existence of parametric conditions, normal distribution, variables independence, and the interval scale of both variables, Pearson Correlation coefficient test is used to investigate the relationship. Pearson correlation analysis did not show a significant correlation between stray animals' killing with animal bites incidence ($P=0.74$, $r=-0.023$).

Conclusion: Due to 84% of animal bite cases occurred by domestic dogs in the last 18 years, killing of stray animals not only had effect on reducing the incidence of animal bite cases, but also it increases the costs and immoral methods of animal killings. The plans such as training of dog-owners (to keep in fetters of the dogs) and training of the population, especially schoolchildren, can be effective in domestic dog bites reduction.

Keywords: Animal Bite, Rabies, Stray Animals' Killing, Pearson Correlation Coefficient, Correlation Analysis