Study of the antifungal effects of nanoemulsion and essential oils of Trachyspermum ammi on the Aspergillus niger and the survey of its antioxidant effects on shelf life of hamburger

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Hamburger is one of the most sensitive protein foods that can be a proper environment for the growth of bacteria, yeasts and fungi. Hence, the potential risk of food poisoning and possibility of contamination of this product is high. In the present study, the antifungal effects of Trachyspermum ammi essential oils and nanoemulsion of essential oils on the hamburgers that contaminated with Aspergillus niger were compared with MIC (Minimum Inhibitance Concentration) and MFC (Minimum Fungicidal Concentration) that was determined by microdilution method. Based on the results of the tests, essential oil and nanoemulsion had an inhibitory effect on the growth of the fungal species tested on the hamburger in all days of the experiment, and the essential oil of nanoemulsion significantly increased the antifungal effect of the essential oil. (P<0.05) In the TBARS test, it was shown that the essential oil and nano-azaance reduced the TBA index in this test, which indicates the antioxidant effect in the hamburger. There was no significant difference between essential oil and nano-essential oils in the test.

Keywords: Aspergillus niger, Trachyspermum ammi, Nanoemulsion of essential oil, Hamburger, antioxidant
Investigation of TruMDR\textsubscript{2} gene expression of \textit{Trichophyton rubrum} in response to terbinafine and nanoterbinafine

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\textit{Trichophyton rubrum} is one of the most common causes of dermatophytosis. Increasing the expression of the TruMDR\textsubscript{2} gene, which codes efflux pumps, results in resistance to \textit{T. rubrum} versus terbinafine. Researching on new antifungal agents that can reduce the expression of this gene leading to decreases resistance to terbinafine is undeniable. The purpose of this study was to evaluate the expression of TruMDR\textsubscript{2} gene on clinical isolates of \textit{T. rubrum} against terbinafine and nanoterbinafine. In this study, two isolates of \textit{T. rubrum} isolated from the onychomycosis lesions were identified by phenotyping and genotyping, and the anti-fungal susceptibility testing of terbinafine and nano-terbinafine was done by Broth microdilution according to the CLSI method. Then gene expression of TruMDR\textsubscript{2} in two distinct isolates were investigated in sub MIC concentrations of terbinafine and nano-terbinafine. The results showed that in the presence of sub-MIC concentrations of terbinafine, the expression of the gene was 16/222 and 18/636, while the expression of the gene was in the sub MIC concentrations of nanoterbinafine 7/913 and 9/190. According to the findings of this study, the expression of TruMDR\textsubscript{2} gene expression in both two isolates was lower increasing in present of sub MIC concentration of nano terbinafine in compared to terbinafine.

\textbf{Keywords:} TruMDR\textsubscript{2} gene, \textit{Trichophyton rubrum}, Terbinafine, Nanoterbinafine
Study of the effect of supplement of soy isoflavone on the healing process of cutaneous wound in ovariectomized cats

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Sterilization surgery in dogs and cats is a common surgical procedure in veterinary medicine, which can be done in two ways: Ovariohysterectomy (OHE) and Ovariectomy (OVE). Since some diets in cats contain lots of Genistein and Daidzein, studying of the effect of soy isoflavone on the wound healing process is essential. In this study, 10 cats of the DSH, 1 year old, were used. OVE was done by midline approach. After surgery, cats divided into two groups including isoflavone and placebo. The isoflavone group received 50 mg of oral isoflavone daily. In the control group, placebo was used. After 14 and 28 days, biopsy of the surgical wound was taken for histopathological examination to evaluate the amount of collagen, angiogenesis and fibroblasts. Based on the findings, On Day 14 after injury, wound micrographs showed that there was no significant difference between treatment and control groups (P ≥ 0.05). Furthermore, on day 28 after the injury, the healing rate in the treatment group was higher than control group significantly (P≤0.05). In summary, results of this study showed that the application of supplement of soy isoflavone could improve the healing process of cutaneous wound in ovariectomized cats.

Keywords: Soy isoflavone, Ovariectomy, Wound, Cat
Prevalence of *salmonella* serotypes in livestock feedstuff and their antibiotic resistance to antibiotics widely used in the Iranian health centers

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Salmonellosis is an important zoonotic disease that the most of *salmonella* infection in humans result from the ingestion of contaminated food. In recent years, resistance of *salmonella* to commonly used antimicrobials is increasing and has emerged as a global problem. The purpose of this study was to determine the prevalence of *salmonella* serotypes in livestock feedstuff and their antibiotics resistance rate to antibacterial agents widely used in the Iranian health centers. To achieve this, fifty samples from livestock feedstuff were collected randomly from different parts of Ardabil city for identification of *salmonella*. The antibiotic resistance rate of isolates was determined using Kirby-Bauer method. Out of 50 samples examined, *Salmonella* was isolated from 4 samples (8%). The result of serotyping was Enteritidis (50%), Muenchen (25%) and Unknown (25%). Multiple resistance was observed among isolates. The highest resistance was to Tetracycline (100%), Sulfamethoxazole + trimethoprim (100%), Cotrimoxazole (100%), Amicycin (100%), Chloramphenicol (66.7%), Amoxicillin (66.7%), Doxycycline (33.4%), Florfenicol (33.4%) and Enrofloxacin (33.4%). All isolated were sensitive to Ciprofloxacin. The highest resistance rate was found against most prevalent drugs in poultry and animal industry, reinforcing this hypothesis that wide usage of drugs in the livestock feedstuff results in vast drug resistant bacteria.

**Keywords:** *Salmonella*, Serotyping, Livestock feedstuff, Antibiotic resistance
The Effect of Aerobic Exercise on Hematological Factors in Antidote Production Horses

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Iran is one of the most exclusive antidote producers within the Middle East. Blood serum production of high quality treatment and fewer side effects have a significant impact on public health. This may only be attainable if eutherian and animal health are to be provided. The employment of sports activities as a nonpharmacological method will play a crucial role in maintaining and improving the health of the livestock. The purpose of this study was to investigate the result of aerobic exercises on hematological factors in antidote production horses. Sixteen horses were arbitrarily divided into two groups of venom and venom + training group for 22 weeks within the antidote production cycle. The exercise protocol consisted of three sessions of aerobic exercise per week, with moderate intensity. Blood samples at three different times: Before the beginning of the protocol, end of the 11-week period and therefore the end of the 22-week period were collected through the jugular vein and evaluated by repeated measures of variance analysis. The results showed that almost all of the measured factors reduced the number of red blood cells, hemoglobin, hematocrit, platelet count and white blood cells, neutrophils, monocytes, eosinophils and MCV in each groups, whereas the number of lymphocytes, MCH and MCHC increased (P <0.05). In sum, the results of this study showed that physical activity and venom are each factors influencing hematological factors, Although most of the results were influenced by the effect of the venom, the impact level within the venom + training group was less than that of the venom group.

Keywords: Aerobic exercise, Hematological factors, Horse, Antidote.
Comparison of ocular microflora in New Zealand white, Angora and Dutch Rabbits

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One of the important ocular tests in case of ophthalmic infection and corneal ulcer is microbial culture. In the present study ocular microflora of Newzealand white, angora, and Dutch rabbits were evaluated. 96 rabbits from three different breeds (32 of each breed) were studied. All animals enrolled in the study after complete physical and ophthalmic examination. Ophthalmic examination was including slit lamp biomicroscopy, ophthalmoscopy, measurement of intraocular pressure, measurement of tear production, corneal dye with fluorescein. For microbiologic evaluation, sterile swabs were used for sampling from the cornea and lower conjunctival fornix. The culture was initiated immediately after sampling. After 48 hours of incubation, the growth of bacteria was observed, and then differential and biochemistry tests were performed. Results of microbiological culture revealed the difference in bacteria species, especially in gram-negative ones. More eyes with positive bacterial culture were observed in Dutch rabbits. No significant differences were reported in gram-positive bacteria population. Common isolated ocular microflora of rabbits is gram-positive. Clinical significant differences in isolated bacteria and species were observed.

Keywords: Microbiology, Rabbit, New Zealand, Angora, Dutch
Anatomical and Histological study of the Small intestine in See-see
*(Ammoperdixgriseogularis)*

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The importance of anatomical and histological studies of the small intestine in birds is for autopsy examinations and pathological changes in infectious and metabolic diseases. The aim of this study was to investigate the morphometric and morphological features of small intestine in See-see. See-see is a kind of partridge that can be found in large areas of Iran. For this research, 7 male and 7 female partridges were randomly selected. Moreover, for histological study, tissue samples were obtained from 3 males and 3 females and were stained with hematoxylin and eosin. The small intestine in See-see contained 61% of the length of the gastrointestinal tract and consisted of 3 distinct sections of the duodenum, the jejunum and the ileum. The duodenum was a U-shaped ring and the jejunum had 4 to 5 small loops. Histologically, the small intestine has many villi in order to create maximum surface to absorb food and goblet cells were observed in all three sections. Although the number of cells and the height of the villi were diverse in different parts of intestine. The submucosa was also a thin layer in all sections and was with no lymphoid structure. The results show that the anatomical and histological structures of duodenum, jejunum and ileum in see-see, despite the slight differences in histomorphology, is similar to birds.

**Keywords: Anatomy, Histology, Small intestine, See-see.**
Evaluation of the effects of celecoxib on mouse lymphoma cells (EL4)
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Lymphoma is one of the most common tumors in most species of the mouse. On the other hand, biologic, histopathologic and epidemiological characteristics of mouse lymphoma are similar to lymphoma in humans. Hence, tumor lymphoma in mice can be a suitable model for the biological study of human cancers.

The objective of the present study was to evaluate the apoptotic and cytotoxic effects of celecoxib on mouse lymphoma tumor cells (EL4) using Annexin/PI and MTT assays. The results of MTT showed a dose and time-dependent inhibition of EL4 cells by celecoxib and 50% inhibition of cell survival at 20 μm of celecoxib. In addition, the percentage of cells with apoptosis increased after 48 hours exposure to IC50 concentration (50% survival of the exposed cells) of celecoxib. Based on the obtained results, it seems that celecoxib can be used as an adjunct therapy along with other compounds used to treat lymphoma in mice and probably in human medicine.

Keywords: Celecoxib, Apoptosis, EL4 cell line, Mouse, Lymphoma