Effects of ZnO nanoparticles and Zn ions on gill histopathology of rainbow trout (*Oncorhynchusmykiss*)

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The purpose of this study was to the effect of ZnO NPs and Zn ions on gill histopathology of rainbow trout (*Oncorhynchusmykiss*). In this study, 60 rainbow trout were used. Moreover, two non-lethal concentrations of ZnO NPs and Zn ions included 0.5 mg L^{-1} and 0.05 µg L^{-1} with the control group (no chemicals) were used. After 14 days of exposure to these materials, gill tissue samples were taken. In order to study classical histological, samples prepared by hematoxylin - eosin staining and by optical microscopy slides were photographed. The most important damages caused on the gill tissue are including curvature secondary lamella, hypertrophy, increased mucus secretion, aneurism, hyperplasia, and finally necrosis. The levels of damages on exposed to Zn NPs were higher than Zn ions; and severity of tissue damage in 0.5 mg L^{-1} was higher than 0.05 µg g^{-1}. According to results, we can say that NPs can impact and damage the fish's gill tissue, so it is necessary to pay attention when using these NPs done more and release it into the environment be avoided.

***Keywords**: Zn NPs, Zn ion, Rainbow trout, Gill, Pathology*

Genomic identification of *Campylobacter fetus* and *Leptospira introgans* in aborted sheep fetuses in the selected provinces of Iran by PCR

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Abortion causes significant economic losses to the livestock investment of a country and reduces fertility and production. Infectious agents are responsible a part of the sheep abortions and often, they are contagious and zoonosis, so they are also considered in terms of public health. *Campylobacter fetus* and *Leptospira introgans* are some of the infectious agents of ovine abortion worldwide and economic and hygienic losses resulting from them are significant. Due to the importance of Campylobacterial and leptospiral sheep abortions, in this study 98 samples from abomasal contents of aborted sheep fetuses in Isfahan, Chaharmahal va Bakhtiari and Khorasan Razavi provinces were investigated for *Campylobacter fetus* subspecies fetus and *Leptospira introgans* by PCR.

Results showed that the infection with *Campylobacter fetus* in the samples studied was 4.9% and any samples weren't found to be infected with Leptospira. The results of this study showed that *campylobacter fetus* might be involved in the incidence of a part of sheep abortions.

According to different diagnostic methods of the Leptospira, it seems that any diagnostic procedure has some weaknesses and using only a test is one can't certainly report that the presence of this agent is negative. Therefore, it is recommended to several methods to be used simultaneously in order to compare the results of several methods and achieve accurate diagnosis.

Keywords: *PCR, Abortion, Campylobacter fetus, Leptospira introgans*

Geographic Determination of *Theileria ovis* in goat in Tehran Province using molecular method

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Theileria ovis is one of the benign hemoprotozoal agents in sheep and goat in tropical and subtropical regions which is transmitted by ixodid ticks. This study was carried out on 400 randomly selected healthy goats for determining the distribution of *T. ovis*. After preparing the blood smears, they were examined staining by Giemsa method for microscopic studies. In order to molecular diagnosis, DNA was extracted from blood samples. Subsequently, the genomic DNA from piroplasms was first extracted and then amplified with the primer pair using hyper variable region V4 of 18S rRNA for simultaneous differentiation of *Theileria* and *Babesia*. Differential diagnosis of *Theileria ovis* from *T. annulata* and *T. lestoquardi* was performed using Semi-nested PCR technique on the PCR products with primers specific derived from hyper variable region V4 of 18S rRNA, P2, P3 for *T. ovis* and with primers specific derived from *ms1-2* gene for *T. lestoquardi* (P4, P6) and *T. annulata* (P5, P6). The results of microscopic examinations showed that 1.7 % (7/400) were positive for the presence of *T. ovis* in comparison to *T. ovis* which were 6% (24/400) in Semi-nested PCR. The results of present study revealed that *T. ovis* is detectable in goats without any clinical manifestation. Therefore, the goats can be served as reservoirs of the infection for ticks and transmission agents of this parasite to the sheep.

Keywords: *Theileria, Semi-nested PCR, Goat, Tehran province*

Experimental study on histopathologic changes and tissue tropism of 793/B serotype of Infectious bronchitis in broiler chickens

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Avian infectious bronchitis is an important pathogen in poultry industry, which commonly induces respiratory diseases, with tropism to other organs based on strains. The aim of this study was to investigate the tissue lesions and tropism of avian infectious bronchitis virus strain 793/B in experimentally infected broiler chickens. In this study, tissue lesions and dissemination of 793/B serotypes of IBV in different organs of broiler chickens was studied. Ninety-one-day-old chicks were divided randomly into two groups (45chicks per group). At the age of 10 days old the chicks in group1 were inoculated intraocularly with 10^3EID_{50} of the 793/B isolate, and group2 was kept as control. The samples from various tissues were collected at 2 till 16 days' post-inoculation (PI) for virus detection and histopathology. The chicks of infected group exhibited depression at 2 to 8 days PI. The IBV virus was detected in the cloaca and kidney through the study, in trachea virus was detected on days 2 to 8 and in lung samples on 2-6 days PI. In trachea virus causes deciliation, epithelium hyperplasia, mononuclear and heterophils infiltration. Lung tissue was hyperemic, hemorrhagic, and edema and fibrinous exudate with mononuclear infiltrations was seen. In kidney tissue hyperemia and hemorrhage with necrosis of tubules was recorded. The results of this study indicated that the 793/B serotype of IBV cannot cause mortality, clinical signs or gross lesions in infected chickens.

Keywords: *Histopathology, Dissemination, Infectious Bronchitis Virus, 793/B serotype*

Histopathological alterations of the liver, kidney, intestine and gills of farmed rainbow trout (*OncorhynchusMykiss*) fed a diet containing 1% powder of *Aloe vera* extract

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Despite the increasing use of Aloe vera in aquaculture, toxicity and possible side effects have not been studied in rainbow trout. The aim of this study was to investigate the possibility of some tissue change in farmed rainbow trout *(Oncorhynchusmykiss)* fed with feed containing 1% of hydro-alcoholic extract of *Aloe vera*. Six hundred pieces' healthy fish, average means 13 grams were randomly allocate into 2 groups, including *Aloe vera* extract-treated (1%) and control (placebo 1%), each of triplicates. Their feed has been previously prepared. At the end of the tenth week, 2 fish pieces was caught in each replicate. After anesthesia, the fish were autopsied. The liver, intestine, kidney and gills of fishes were removed. Specimens were fixed in 10% formalin, stained by using Hematoxylin and Eosin (H&E). Finally, prepared tissues were evaluated by optical microscopy. The results were no shown any changes in intestinal histology in the *Aloe vera extract*-treated group. However, melanomacrophage centers development was observed in liver and kidney in some fish's *Aloe vera* extract-treated. Such limited tissue changes were natural reaction of studied tissues to the foreign matter (xenobiotics). Some of the gill specimens in both groups showed epithelial cells hyperplasia in primary gill lamella, which is no related to medicinal treatment. It was possibility concern to environmental conditions and water quality. Based on the above findings, it seems that the selected dose of *Aloe vera* extract has not been detrimental to vital organs of fish in this research study.

***Keywords**: Rainbow trout, Aloe vera, Histopathology*

Optimization of PCR Conditions for CHD-W and CHD-Z for Sex identification in the canary

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Bird species are considered sexually monomorphic, so in many bird species, the sex identification is very difficult especially in young birds. Since male canary is more important in warbling, sex identification of canary before puberty is important financially. Molecular genetic techniques can be use for sex identification of animals. Genes on the sex chromosomes are unique because of their sex-specific inheritance. PCR method based on chromo helicase DNA binding protein genes (CHD-Z and CHD-W) has been explained for sex identification in canary. The aim of the present study was to optimize of the PCR conditions for CHD-Z for sex identification in the canary. In this study genomic DNA was extracted from feather bulb of 24 canaries (old and young) of canary. PCR reaction was performed by a set of primers designed on the basis of the sequence of the CHD-W gene and optimized conditions was determined as follow: 94°C, 5min for initial denaturation then 35 cycle of 94°C for 60 sec, 58°C for 35sec, 72°C for 50sec, and a final 72°C for 5min. This study showed optimized PCR can be used for sex identification of canary with high accuracy. Therefore, it is the best method for this purpose.

Keywords: *Canary, Sex identification, PCR*

Study of effect of olive oil on re-epithelialization of epithelial tissue in excision wound healing model in rats

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Olive oil has been used for medical purposes. It has beneficial effects on cardiovascular and metabolic diseases, inflammatory and autoimmune diseases. The objective of this study was to find out the efficacy of topical administration of olive oil on dermal wound healing in rats. After creating full-thickness skin wounds on the back of 60 male Wistar rats, rats randomly divided into six groups, as control, sham, treatment and standard. Control group was intact. Sham group received eucerin as vehicle. Treated group received the olive oil at doses 2, 5 and 10%, dissolved in eucerin. Standard group were treated with phenytoin ointment 1%. Wound healing rats were calculated on days 3, 7, 11, 14, 18 and 21 post-wounding and the wound tissues were harvested at 3, 7, 14 and 21 days for histological studies. All of rats were sacrificed, and the skin around incision area was dissected and stained by Masson's trichrome methods for tissue analysis. The results indicated a significant decrease in the diameter of wound in the treated and standard groups comparing to the control groups. A significant increase in the rate of re-epithelialization was observed at 14 days in the treated and standard groups compared to the control group. The results demonstrate that olive oil significantly accelerates cutaneous wound healing and its effect may be due to the increased re-epithelialization. It was concluded that it can be considered as a therapeutic agent for wound healing.

Keywords: *Olive oil; Full-thickness skin wounds; Rat*