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Comparative study of red blood cell abnormalities in the Caspian trout (*Salmo trutta caspius*), rainbow trout (*Oncorhynchus mykiss*) and their triploid hybrids

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Abstract

Since the shape and size of red blood cells are very important in physiological aspects of animals sciences, specially in respirations and nutrient transportation, this study was conducted to survey the changes in shape and size of red blood cell (abnormalities) in rainbow trout (*Oncorhynchus mykiss*), the Caspian trout (*Salmo trutta caspius*) and their triploid hybrids (*Oncorhynchus mykiss* ♀ × *Salmo trutta caspius* ♂). Triploidy was induced in eggs using 10-min heat shock at 28°C following 10-min post fertilization. The accuracy of ploidy induction was determined by comparison the cell size. The results from comparison of rainbow trout, caspian trout and their triploid hybrids showed that in all aspects of red blood cells such as large and small axes of nucleus and cell, axis of nucleus and cell, volume and area of nucleus except volume of cell, there is not significant differences between rainbow trout and caspian trout ($p>0.05$) but triploidy leads to a significant increase in all mentioned characters in triploid hybrids as compared to caspian trout and rainbow trout ($p<0.05$). The morphological abnormalities in the red triploid cells were noticeably higher than diploids. The most abundant types of abnormalities include poikilocytosis, macrocytosis, and incomplete cytoplasmic cells. Triploid hybrids have many alterations of hematological factors that these alterations may affect stress ful responses, immunology, health conditions, growth, and survival triploid.

Keywords: Blood, Cell, Abnormal, Incomplete cytoplasmic

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The Effect of using *Spirulina* Algae extract (*Spirulina platensis*) and mimosa (*Acacia mearnsii*) on Siberian Sturgeon (*Acipenser baerii*) skin tanning

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Abstract

Increasing exploitation of aquatic resources for optimal use of fisheries wastes like fish's skin and production of by-products of its, has appropriated various activities to itself that can refer to supplying the leather from aquatics' skin. In this research the effect of using *Spirulina* and *Mimosa* extracts on the process of leather production from *Acipenser baerii*'s skin was studied. Treatments included treatment A (tanning with methanolic extract of *Spirulina*), treatment B (tanning with watery extract of *Spirulina*) and treatment C (tanning with *Mimosa*). The experiments to investigate the quality of produced leather included tensile strength, stitching strength, abrasion stability, color stability, thermal resistance and adhesion stability. In treatment A, the skin became worn out after tanning process and by performing thermal test, the appearance of the skin wrinkled and had visible changes that indicated the lack of tanning power of the algae's methanolic extract. In treatment B, due to the absence of the decay in appearance after tanning process, the sample was tasted under the thermal resistance test for more investigation of tanning power of the extract, which like the skin A, the appearance of the skin completely changed, and tissue shrinkage occurred in the heat. The best quality was observed in treatment C. Due to the great tanning power of *Mimosa* the skin got out of normal state and turned into leather. This treatment was first subjected to thermal test in order to ensure complete tanning and then the mentioned experiments were carried out to check the quality of produced leather.

Keywords: *Spirulina platensis*, *Mimosa*, *Acipenser baerii*, tanning, leather

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The Survey of the possibility of the Seagrass (*Ruppia maritima*) extension in Gomishan Shrimp Culture Site (Golestan Province)

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Abstract

Sampling of *Ruppia maritima* were done from Caspian Sea coast and channel of Gomishan shrimp culture site in Golestan province in summer 2016. Identification of species performed by internal references and confirmation of scientific name done in relation to foreign experts. Distribution of this species is very extensive in tropical and semi tropical area of brakish waters, marine waters in sea and oceans. The density of this species usually is very abundant in Caspian sea coasts as well. This species belonged to Kingdom of plantae, phylum of Tracheophyta, Class of Angiosperm, Order of najadales, Family of ruppiaceae, Genus of *Ruppia* and species of *maritima*. This species grow on muddy and muddy-sandy substrates with rhizoid. Although this species is part of important primary producers in sea, from the point of view of economic is not importance. it is appropriate shelter and nursery area for is important and commercial aquatic in zone. As a result, it importance from the point of view of ecological. whereas, this species may be disturbed in shrimp culture ponds and also little studies have performed in this case, therefore, in this research in addition to introducing this species, prevent ways of extension of that be mentioned in zone.

Keywords: Seagrass, *Ruppia maritima*, Site of Gomishan Shrimp

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The effects of different levels of raffinose on growth performance and mucosal immune parameters in common carp (*Cyprinus carpio*) fingerlings

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Abstract

In this research, the effect of dietary prebiotic raffinose was investigated on the growth performance and mucosal immune parameters of common carp (*Cyprinus carpio*) fingerlings. Carps (average weight of 6.25 ± 0.09 g) were fed diets containing various levels of prebiotic raffinose include 0 (control), 1, 2 and 4 g/kg for 8 weeks. Each treatment was repeated in triplicates. At the end of the experiment, sampling of mucus and evaluation of growth parameters were performed. The results of the study showed that mucus total immunoglobulin level in raffinose fed fish showed significant increase as compared to control group ($P < 0.05$) and the highest amount was recorded in 4 g raffinose treatment. Lysozyme activity showed non-significant elevation in prebiotics treatments compared with control group ($P < 0.05$). In addition, supplementation of diet with different levels of raffinose had no significant effect on growth parameters (final weight, weight gain, and specific growth factor), food conversion ratio and survival ($P < 0.05$). Although administration of raffinose had no effect on growth parameters, considering the results administration of 2 or 4 g/kg raffinose is recommended for elevation of some mucosal immune parameters in common carp.

Keywords: Prebiotic, Raffinose, Lysozyme Activity, Total Immunoglobulin, Common Carp (*Cyprinus carpio*)

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Investigation of immunological characteristics of rainbow trout in Gomishan saltwater ponds with those reared in freshwater

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Abstract

The aim of this study was to compare immune responses of rainbow trout in saltwater earthen ponds in Gomishan shrimp culture sites and freshwater fiberglass tanks. To the end, 10000 fish were distributed in a three-ha earthen pond and 150 fish in three fiberglass tanks (2000L). Blood samples were taken after 3 months. There was no significant difference in water temperature, dissolved oxygen and pH between the pond and tanks ($P>0.05$); however, water salinity and ammonia was higher in the pond compared to the tanks ($P<0.05$). There was no significant difference in serum albumin between the treatments ($P>0.05$); however, fish in the pond had significantly lower serum protein, globulin, lysozyme, complement and total immunoglobulin compared to the fish reared in the tanks ($P<0.05$). The results showed that the fish in the earthen pond had weaker immune responses compared to those reared in freshwater, which might be due to increase in water salinity and ammonia.

Keywords: Trout, Earthen pond, Immune, Saltwater

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Study of benthic of Haraz river under the influence of rainbow trout farm

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Abstract

Recognition and review of sources of surface water is very important, specially about rivers and stream, in order to apply optimized management. About this research, sampling was performed seasonally by surber sampler with 3 replications in 4 stations farm before and after of fish breeding farm. In the laboratory, clustered bands were examined qualitatively and quantitatively in the genus or species. The results of the study showed the presence of 11 categories or macrobenthic orders belonging to 19 families. The most impact of was on the Ephemeroptera, Trichoptera and Plecoptera and has reduced population growth at the station 3 (outlet). On contrary, the population of the Chironomidae family, which is a kind of benthos invertebrates resistant to population, has increased in the output station. In the further research process and with the getting away from farm, resistant to population species was reduced.

Keywords: Pollution, Frequency, Benthose

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Study and comparison of physicochemical parameters on water quality of Roein river in Esfarayen in summer and winter

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Abstract

The present study was carried out in Roein River of Esfarain, North of Khorasan Province, to investigate the effect of salmon farm wastewater on water quality indices. Sampling was carried out in two warm and cold seasons from July 2016 to March 2017 by measuring of some water physicochemical parameters including temperature, PH, EC, BOD₅, TDS, NO₃, PO₄ and NH as well as total microbial load. According to the results of this study, the parameters of NH, BOD₅, PO₄ and microbial load after reaching their maximum level at the second station, had a decreasing trend, which according to the expected chart, with increasing distance from the fourth station they will reach their initial value. NO and PH were similar to the same, with this difference that their maximum value was at the second station, and then fell to their initial value. It means the river has a positive impact on the reduction of the above-mentioned physicochemical factors. The TDS and EC, though the process of modifying was incremental, it did not seem to be a limiting factor by looking at their changes in their magnitude, even at a distance from the fourth station. Temperature was the only factor that its changes did not correlate with the river and it was 100% dependent on the temperature of the environment, which increased in summer and decreased in winter, and based on the results, it was found that the decrease in temperature was greater than its increase and the increase in the distance from the farm has had a negative impact on it.

Keywords: North Khorasan province, Fish Farm effluent, Esfarain, Roein

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