Effects of Fasting on Growth Patterns, Body Chemical Composition and Non-Specific Immune Parameters in Two Weights of Yellow Fin Seabream, *Acanthopagrus latus*, Houttyn, 1782

Paria Akbary[1]*

1. Assistant Professor of Fisheries Group, Marine Sciences Faculty, Chabahar Maritime University, Chabahar, Iran

Received date: 05-Aug.-2015 Accepted date: 28-Apr.-2016

Abstract

The present study investigated effects of starvation on growth, body chemical composition and non-specific immune parameters in yellow fin seabream. In this study, 120 fish with a mean length of 8.05± 0.98 cm and weight of 7.46± 1.07 g (was referred as size A) and 120 fish with a mean length of 11.05 ± 0.86 cm and weight of 18.01± 3.07 g (was referred size B) were used with each size was comprised of those fed and starved with three replicates (20 fish per replicate) in a 60- L plastic tanks. The specimens were sampled at 10, 20 and 30 days of food deprivation. The results showed that in starved group of size A, specific growth ratio (SGR), condition factor (CF), final weight, increased weight gain (IWG), hepatic- somatic index (HSI), decreased significantly ($P<0.05$), whereas no significant difference was detected in those parameters (except for HSI and CF) and proximate composition between starved and fed groups of size B. In size A, crude lipid in the whole body of starved group decreased significantly and crude protein and moisture increased significantly compared to those in the fed group. No significant difference was found in survival of each size between fed and starved groups at any sampling time throughout the experiment. Lysozyme activity increased significantly in the starved group of each size from day 20 onwards. The present results indicated that in size A of yellowfin seabream, both growth performance and carcass quality of the starved group decreased significantly compared to those of the fed group.

Key words: Food Deprivation, Size, Specific Growth Ratio, Hepatic Somatic Index, Lysozyme, *Acanthopagrus latus*

* Correspondng author Tel.: 0543127234 Fax: 05435324513 Email: paria.akbary@gmail.com

Effects of Various Sodium and Potassium Concentrations Mediums on Na/K-Atpase Activity and Condition Indices at Different Larval Stages of *Macrobrachium rosenbergii*

Kamran Rezaei Tavabe[1]*, Gholamreza Rafiee[2]

1. Assistant Professor, Fisheries Department, Natural Resources Faculty, University of Tehran
2. Professor, Fisheries Department, Natural Resources Faculty, University of Tehran

Received date: 03-Jan.-2016 Accepted date: 02-May-2016

Abstract

Macrobrachium rosenbergii lifecycle is unique so that the adults thrive in freshwater and larval development requires brackish water environments near to estuaries as close as possible to larval body isosmotic for minimum Na/K-ATPase activity and maximum ATP storage. Osmoregulation system at early larval stages is not formed and larval osmoregulation is mainly attributed to Na/K-ATPase activity. The present study aimed to evaluate effects of various sodium and potassium concentrations on Na/K-ATPase activity, larval condition index (LCI) and survival rate of *M. rosenbergii* at 1st, 4th, 7th and 11th larval stages. Triplicate treatments of Sodium (2000, 3000, 4000 and 5000 ppm) and potassium (100, 150, 200 and 250 ppm) were prepared separately in tanks (100-L) and initial larvae density was fixed 200 larvae L^{-1}. The treatments were set up at 12 ppt salinity based on New artificial brackish water composition. To adjust desired concentrations of sodium and potassium for the treatments, their soluble salts, including NaCl and KCl, were used. The results indicated that evaluation of the freshwater prawn larval quality according to Na/K-ATPase activity is a better index than LCI and survival rate. The results also showed that isotonic condition and minimum Na/K-ATPase activity at 1st and 4th larval stages and 7th and 11th stages occurred respectively in 4000 and 3000 ppm sodium treatments but this index for potassium treatments was 150 ppm for the all larval stages.

Keywords: Freshwater Prawn, Na/K-ATPase Activity, Larval Condition Index, Osmoregulation, Isotonic

* Corresponding author Tel.: +989177070166 Email: krtavabe@ut.ac.ir

Effects of Dietary Calcium Chloride and Glutamine on Growth Parameters and Carcass Composition in *Cyprinus carpio*

Valiollah Jafari[1], Sheyda Goli[2]*, Goli Nouri[3]

1. Associate professor, Gorgan University of Agricultural Sciences and Natural Resources, Gorgan, Iran
2. PhD student, Gorgan University of Agricultural Sciences and Natural Resources, Gorgan, Iran
3. MSc of Fisheries, Gorgan University of Agricultural Sciences and Natural Resources, Gorgan, Iran

Received date: 12-Sep.-2015 Accepted date: 13-Nov.-2015

Abstract

Dietary food stimulants decrease feeding time and wasted food. In the present study, effects of adding calcium chloride and free amino acids glutamine to diet on food intake, growth performance and carcass composition of common carp were investigated. The examined food samples were 9.0 mM calcium chloride, 1.0 mM amino acid glutamine 9.0 mM calcium chloride and 1.0 mM glutamine amino acid and the control treatments. Each were performed with three replicates. The results demonstrated that these feed additives changed growth parameters in carp. The highest increase in weight gain and body weight percentage were found in the treatment of glutamine and then combined treatment being different significantly with those of the control group ($P \leq 0.05$). The highest daily growth rate and the lowest feed conversion ratio were found in amino acid glutamine treatment which was not different significantly from those of the control ($P \geq 0.05$). According to the results, these amino acids can used as food stimulants in diet of common carp.

Keywords: Common Carp, Food Stimulant, Free Amino Acid, Glutamine, Calcium Chloride

* Corresponding author Email: golisheyda@gmail.com

Identification of Benthic Population Structure in the Abgarmeh Saleh Abad River, the Ilam Province

Mehran Javaheri Baboli[1], Mohammad Velayatzadeh[2]*, Elham Mohammadzadeh[3]

1. Department of Fisheries, Ahvaz Branch, Islamic Azad University, Ahvaz, Iran
2. Young Researchers and Elite Club, Ahvaz Branch, Islamic Azad University, Ahvaz, Iran
3. Department of Fisheries, Faculty of Natural Resources and Agriculture, Islamic Azad University, Ahvaz Branch, Iran

Received date: 18-Oct.-2013 Accepted date: 30-Apr.-2016

Abstract

Aquatic invertebrates are the major group of freshwater animals in aquatic ecosystems in terms of biology and food chain. This study was conducted to identify benthic communities in four stations of the Abgarmeh River (Saleh Abad, the Ilam Province) during 2007-2008. In this study Eighteen families of benthose such as Naididae, Tubificidae, Lumbricidae, Erpobdellidae, Gammaridae, Haliplidae, Corixidae, Gerridae, Perlidae, Ecdyonuridae and 12 genera of four class leeches, crustaceans, aquatic insects and oligochaeta were identified including Diptera with 19.64% and leeches (Hirudinea) with 4.04% having the highest and lowest frequencies during the study period, respectively. The highest frequency was recorded in December with 86 samples/cm^2 and the lowest frequency with 42 samples/cm^2 in April. Diptera had the highest frequency in the first, second and third stations while odanata in the fourth station. 620 specimens were identified, belonged to seven orders, of them diptera with 26.61 had the highest frequency among the aquatic insects. In general, the diptera had the highest frequency and Plecoptera and Trichoptera the lowest abundance throughout the year in the Abgarmeh River.

Keywords: Aquatic Invertebrates, Benthic, Diptera, Abgarmeh River, Ilam Province

* Corresponding author Email: mv.5908@gmail.com

The Possibility of Partial Replacement of Olive Pomace with Some Dietary Items of Rainbow Trout (*Oncorhynchus mykiss* Walbaum, 1792)

Majidreza Khoshkholgh[1]*, Majid Mosapour Shajani[1], Mohammad Mohammadi Baresari[1]

1. Fisheries Department, Faculty of Natural Resources, University of Guilan, Sowmeh Sara, P.O. Box 1144, Guilan, Iran

Received date: 05-Nov.-2015 Accepted date: 09-May-2016

Abstract

This study investigated effects of different levels of dietary olive oil pomace on body composition, growth performance, hematological factors and sensory analysis of rainbow trout. Six practical diet containing 0 (control), 2, 4, 6, 8 and 10% olive pomace were formulated and supplied to fish with an average body weight of 184.7 g being allocated randomly to rectangular concrete ponds. Water flow was 10 L S^{-1}. Temperature and pH were 10±3°C and 6.8-7.9, respectively. Fish were fed by hand ad libitum three times a day. At the end of the experiment, eviscerates and beheaded body composition and growth performance were not affected by difference levels of olive pomace ($P > 0.05$). However, hematological parameters were significantly affected by increasing olive oil pomace ($P<0.05$). The findings of this study suggested that a maximum of 8% level of olive oil pomace is the best optimum growth, body composition and hematological factors for rainbow trout.

Keywords: Rainbow Trout, Olive Pomace, Body Composition, Growth Performance, Hematological Parameter, Sensory Analysis

* Corresponding author Tel.: 09113312934 Email: majidreza@guilan.ac.ir

Effects of Dietary L-Carnitine Supplementation on Growth Pattern, Body Chemical Composition, Body Fatty Acid Profile and Insulin Liked Factor- 1 (IGF-1) of Yellowfin Seabream, *Acanthopagrus latus*, Houttyn, 1782

Paria Akbary[1]*

1. Assistant Professor of Fisheries Group, Marine Sciences Faculty, Chabahar Maritime University, Chabahar, Iran

Received date: 19-Aug.-2015 Accepted date: 21-Sep.-2016

Abstract

L- carnitine has been recognized as a new and important dietary supplementation, essential for human and animal nutrition. This study was conducted to evaluate the use of dietary l- carnitine supplementation and its effects on the growth (body final weight, daily growth rate (DGR), feed efficiency (FE), feed conversion ratio (FCR), daily feed intake (DFI), protein efficiency ratio (PER), lipid efficiency ratio (LPE), protein productive value (PPV), lipid productive value (LPV), body compositions (crude protein, crude lipid, ash and moisture), body fatty acid profile and IGF-1 activity in yellowfin seabream. In this study, a number of 240 fish with a mean weight of 3.23± 0.46 g were randomly allocated into four groups (three replicates, 20 fish per tank) in 60-L plastic tanks and fed with four experimental diets having carnitine with the concentrations 0, 400, 800, and 1200 mg kg^{-1} diet (referred as C0, C400, C 800 and C1200 respectively). After 9 weeks of the feeding trial, there was a significant increase in growth performance (except for DGR), carcass quality (crude protein and crude lipid), muscle fatty acid and IGF-1 activity in the fish fed C800 diet compared to those fed the other diets. Also a positive correlation was detected between plasma IGF-1 activity and DGR except for C1200 diet. The diet containing 800 mg kg^{-1} dietary L-carnitine can have marked effects on growth yield, carcass quality, IGF-1 activity and lipid metabolism of yellowfin seabream

Keywords: *Acanthopagrus latus*, L-carnitine, Lipid Metabolism, Growth Performance, Carcass Quality, IGF-1 activity

* Corresponding author Tel.: +985431272340 Email: paria.akbary@gmail.com

The Effects of Ecological Factors of Salinity and Temperature on Intensive Culture of *Acartia tonsa* from the Caspian Sea

Fateme Shakeri[1], Mohammad Ali Nematollahi[2]*, Arash Javanshir[2], Abolghasem Roohi[3]

1 MSc of Aquaculture, Department of Fisheries, Faculty of Natural Resources, University of Tehran, Iran
2 Associate Professor, Department of Fisheries, Faculty of Natural Resources, University of Tehran, Iran
3 Assistant Professor, Iranian Fisheries Research Organization Ecological Research Caspian Sea, Sari, Iran

Received date: 16-Jan.-2016 Accepted date: 29-Jun.-2016

Abstract

The present study carried out an *in vitro* experiment on effects of salinity and temperature on *Acartia tonsa* life cycle from Caspian Sea. During the experiment, temperature and salinity ranged 25, 27, 29 ± 1 °C and 12‰ and 17‰, respectively within a period of 60 days. Spawning rate was measured using mesh size of 100 µ planktonic net from surface to 10 m depth. Early results show that nauplii arrive to adult stage during 8-10 days. Significant differences in nauplii and copepodites stage were found also in different salinities and temperatures. High survival and spawning rate were also found in 17 ‰ and 29 °C ($P < 0.05$). Our investigations showed that in *in vitro* reproduction of *A. tonsa* in the Caspian Sea water with 1-8 eggs per each female may be feasible compared to 17-50 eggs in natural conditions.

Keywords: Caspian Sea, Copepods, *Acartia tonsa*, Salinity, Temperature, Life Cycle

* Corresponding author Tel.: +9826322245909 Email: malahi@ut.ac.ir

Using Discriminant Analysis to Examine Ecological Effects of Rainbow Trout Farms Wastewater on Benthic Community Structure, a Case Study with the Gamasiab River

Lima Tayebi[1], Hadi Poorbagher[2]*, Hamid Farahmand[3], Gholamreza Rafiee[3], Alireza Mirvaghefi[3]

1. PhD Graduate, Department of Fisheries, Faculty of Natural Resources, University of Tehran, Karaj, Iran
2. Associate professor, Department of Fisheries, Faculty of Natural Resources, University of Tehran, Karaj, Iran
3. Professor, Department of Fisheries, Faculty of Natural Resources, University of Tehran, Karaj, Iran

Received date: 17-Feb.-2015 Accepted date: 19-May-2015

Abstract

The Gamasiab River has one of the highest discharge in the western Iran receiving wastewater of trout frames. The present study investigated effects of wastewater using bioassessment of benthic organisms. The benthos were sampled over four seasons using a surber sampler on four stations, upstream, on the farm outlet, 500 and 1000 m down the farm outlet. 5454 benthic fauna were identified that were belonged to 11 orders, 22 families and 25 genera. The ephemeropterids had the highest abundance belonged to four families and six genera. Over all seasons, macroinvertebrates abundance and EPT percentage decreased on the inlet. The taxonomic richness decreased over the spring and autumn and increased in the summer, which was not significant statistically. The Shannon-Weiner diversity index showed no significant changes in most sampling stations. Based on the Hilsinhoff biotic index, the water quality in the sampling stations were very good, good and suitable. Using the discriminant analysis, the outlet of the farm had the highest difference with the sampling stations in the upstream area, and the benthic structure had the highest difference with the samples collected in other seasons. A negative correlation was detected between Shannon-Weiner and EPT/Chir when the sampling stations were examined, and a positive correlation when sampling times (seasons) were examined using discriminant analysis. In conclusion, the water quality improved 1 km downstream of the farm but the benthic structures were not fully recovered.

Keywords: Trout Farm Wastewater, Rainbow Trout, Macroinvertebrates, Gamasiab River, Biotic Indices

* Corresponding author Tel.: +982632223044 Email: poorbagher@ut.ac.ir

Effects of Different Levels of Meal and Alcoholic Extract of Alfalfa (*Medicago sativa*) on Growth Performance, Nutrition, Carcass Biochemical and Some Serum Biochemical Parameters in Common Carp (*Cyprinus carpio*)

Zahra Falamarzi[1], Seyed Mohammad Mousavi[2*], Mohammad Zakeri[3], Nasim Zanguee[3]

1. MSc Student of Aquaculture, Department of Fisheries, Faculty of Marine Natural Resources, Khorramshahr University of Marine Science and Technology, Khorramshahr, Iran
2. Associate Professor, Department of Fisheries, Faculty of Marine Natural Resources, Khorramshahr University of Marine Science and Technology, Khorramshahr, Iran
3. Assistant Professor, Department of Fisheries, Faculty of Marine Natural Resources, Khorramshahr University of Marine Science and Technology, Khorramshahr, Iran

Received date: 13-Nov.-2015 Accepted date: 20-May-2016

Abstract

This research was conducted to evaluate alteration of growth performance, nutrition, carcass and some serum biochemical parameters of common carp fed the diets supplemented by different levels of meal and alcoholic extract of alfalfa (*Medicago sativa*). In this research, 300 fish (mean weight: 20.4 ± 0.19 g and mean length: 11.78 ± 0.64 cm) were fed by nine nutritional diets for 8 weeks. Nutritional treatments were four treatment groups which had increasing levels of alfalfa meal (3, 6, 9 and 12 percent), four treatment groups with increasing levels of alfalfa extract (1, 2, 3 and 4 percent) and one control group (without any meal or extract). Based on the results, adding 9 percent of alfalfa meal and 4 percent alcoholic extract to the diets of examined fish, increased significantly weight gain (WG), body weight gain percent (BWG%), daily growth ratio (DGR), specific growth ratio (SGR), condition factor (CF), hepato somatic index (HIS), and viscero somatic index (VSI), feed efficiency ratio (FER), protein efficiency ratio (PER), carcass protein and lipid and blood serum levels of total protein (TP), globulin (GLUB), glucose (GLUC) and phosphorus (PHOS) in comparison with the control group ($P<0.05$). On the other hand, those treatments, indicated a significantly-decreasing trend in feed conversion ratio (FCR), intraperitoneal fat ratio (IFR), carcass moisture, triglyceride (TG), cholesterol (CHOL), in comparison with the control group ($P<0.05$). There was not any significant difference between experimental treatments for relative length gut (RLG), total feed intake (TFI), and carcass carbohydrate and ash and serum albumin (ALB) and calcium (Ca) levels ($P>0.05$). Based on the results and calculation of economical index, the most economic and the best treatment was 4% of alcoholic extract and 9 % of alfalfa meal for diets of *Cyprinus carpio*.

Keywords: Alfalfa, Growth Performance, Nutrition, Carcass Biochemical, Serum Biochemical Parameters, Common Carp

* Corresponding author Tel.: 09166112522 Email: seied1356@yahoo.com

Effect of Different Levels of Dietary Niacin on the Gut and Liver Histology and Some Liver Enzymes Activity of Juveniles Common Carp (*Cyprinus carpio*)

Kheyri Mohammadi[1], Hamid Mohammadiazarm[2], Amirparviz Salati[2], Ebrahim Rajabzadeh[2]

1. Department of Fisheries, Faculty of Marine Natural Resources, Khorramshar University of Marine Science and Technology, Khorramshar, Khouzestan, Iran
2. Assistant Professor, Department of Fisheries, Faculty of Marine Natural Resources, Khorramshar University of Marine Science and Technology, Khorramshar, Khouzestan, Iran

Received date: 17-Mar.-2016 Accepted date: 05-Jul.-2016

Abstract

This experiment was conducted to examine effects of different levels of niacin on the gut and liver histology and also some activity of the liver enzymes in the blood serum of Common carp. A control diet (containing 30 mg niacin kg^{-1} commercial diet) and four other diets were prepared which had 50, 70, 90 and 110 mg niacin per kg of commercial diet, added by spraying. Fish with initial average weight of 35 g were allocated to 15 circular 300-L tanks at a density of 12 fish per tank and fed the experimental diets to satiation three times a day for 50 days. The result showed that, the activity of the liver enzymes containing alanine aminotransferase and aspartate aminotransferase decreased with increase of niacin but it was not significantly different ($P > 0.05$). Also, the increase of niacin induced a significant increase ($P < 0.05$) in epithelial length of intestine, with the highest value was found in the treatment 90 mg niacin kg^{-1} diet (1280.10 ± 40.93 micrometer), compared with that of the control (308.98 ± 32.42 micrometer). On the other hand, epithelial thickness of intestine decreased significantly ($P < 0.05$), that the lowest value was in treatment of 90 mg niacin kg^{-1} diet (49.49 ± 1.05 micrometer), compared with that of the control (111.27 ± 2.79 micrometer). Based on this study, lipid vacuole decreased in anterior intestine and liver by different levels of niacin. According to these results, addition of 90 mg niacin kg^{-1} diet is recommended for juveniles of Common carp.

Keywords: Niacin, Histology, Liver, Enzyme, Enterocyte, Common Carp

Diversity and Genetic Structure of *Capoeta trutta* (Heckel, 1843) Populations in the Kurdistan Province using Inter Simple Sequence Repeat Markers

Behroz Mirzaei[1], Ebrahim Alizadeh Doughikollaee[2], Barzan Bahrami Kamangar[3]*, Ali Arshadi[4]

1. Msc of Fisheries, Department of Fisheries, Faculty of Natural Resources, University of Zabol, Zabol, Iran
2. Associate Professor, Department of Fisheries, Faculty of Natural Resources, University of Zabol, Zabol, Iran
3. Assistant Professor, Department of fisheries, Faculty of Natural Resources, University of Kurdistan, Sanandaj, Iran
4. Assistant Professor, Department of Fisheries, Faculty of Natural Resources, University of Zabol, Zabol, Iran

Received date: 12-Dec.-2015 Accepted date: 06-Sep.-2016

Abstract

Inter Simple Sequence Repeat (ISSR) analysis was performed to evaluate genetic diversity and genetic structure of six *Capoeta trutta* populations from two main watersheds in the Kurdistan province. Fish samples were caught from the Choman, Shooei, Garmab Rivers in the Choman watershed and from the Gheshlagh, Gavarood, Sirvan Rivers in the Sirvan watershed. From six used dinucleotide primers, three ((AG)9C, (GA)9C and (AC)9T)) generated discernible bands. Fifty six clear and repeatable bands were generated throughout six populations. The percentages of polymorphism were 80.00, 82.98, 82.61, 85.71, 79.60 and 80.49 within the Sirvan, Gavarood, Gheshlagh, Choman, Garmab and Shooei populations, respectively. The average values of heterozygosites were determined as moderate to high within the studied populations. The intrapopulation genetic diversity indices were significantly higher in the Choman population than others. The analysis of molecular variance revealed 89 percent variation within populations whereas only 11 percent between populations. Population comparisons based on fixation index (Fst) revealed low to moderate differentiation between six studied populations. However there was no significant differentiation between populations as testified by exact test. The results showed that environmental conditions to maintain genetic diversity of *Capoeta trutta* populations in two watersheds are moderate.

Keywords: Genetic Diversity, Genetic Structure, ISSR Markers, *Capoeta trutta*, Kurdistan

* Corresponding author Email: bbkamangar@uok.ac.ir