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## Effect of Burma Padauk (*Plerocarpus indicus*), Rain Tree (*Samanea saman* (Jacg.) Merr.) and Siamese Rough Bush (*Streblus asper*) Leaves as Fiber Sources in Total Mixed Ration on *in vitro* Fermentation

S. Chumpawadee and O. Pimpa

The objective of this study was emphasized on effect of leaves as fiber sources in total mixed ration on *in vitro* fermentation using *in vitro* gas production technique. The experimental was designed in CRD with five replicates per treatment. The fiber sources in total mixed ration were corn cob (control group), Burma padauk leaves, rain tree leaves and Siamese rough bush leaves. The results showed that the kinetic of gas production and digestibility were statistical significantly differences among treatment ($p<0.05$). The corn cop as fiber source in total mixed ration gave the highest potential of extent of gas production. However, highest rate of gas production and digestibility were observed in the Siamese rough bush leaves as fiber source. Ruminal fermentation end-products consisted of ammonia nitrogen and volatile fatty acid were significantly differences among treatments ($p<0.05$). All treatment means were within the normal range. The pH values were relatively stable at 7.0-7.3. The results demonstrated that Burma padauk leaves, rain tree leaves and Siamese rough bush leaves can be used as fiber sources in total mixed ration. Importantly, leaves are abundant and available for feeding the ruminants in dry season. *(Asian Journal of Animal and Veterinary Advances 4 (1): 1-8, 2009; **doi:** 10.3923/ajava.2009.1.8)*

## The Effect of Human Chorionic Gonadotropin on the Reproduction Performance in Lory Sheep Synchronized with Different Doses of Pregnant Mare Serum Gonadotrophin Outside the Breeding Season

M.M. Moeini, F. Alipour and A. Moghadam

Two experiments performed to determine the effects of different doses of PMSG and subsequent hCG treatment on the reproductive performance in estrus-induced mature Lory ewes. In first experiment 192 Lory anestrous ewes were divided into two groups and after synchronization with progestagen sponge (Fluorogestone acetate, 40 mg FGA) the ewes in first group ($T_1$) were injected 400IU PMSG and in second group ($T_2$) were injected 600 IU PMSG intramuscularly at sponge removal time. At insemination time (AI) time, ewes divided into 4 subgroups; $T_1$

and $T_2h$ were injected 200 IU hCG and $T_1C$ and $T_2C$ were kept as the controls. In second experiment the effect of supplementing hCG at AI time or 12 days after AI were measured on the reproductive performance using 374 estrus-induced mature Lory ewes. After synchronization with progestagen sponge, all ewes were injected 400IU PMSG. The ewes then, were randomly divided into three groups: the ewes in ($h_0$) were injected 200 IU hCG at AI time, ($h_{12}$) were injected 200 IU hCG at day 12 after mating time and (C) were kept as the control group. Serums progesterone P4 concentrations were measured in days 12, 14 and 16 after AI in both experiments. The result of 1st experiment indicated that single lambs in $T_1h$ subgroup had higher weight compared with $T_1C$ subgroup at birth day ($p<0.05$). The prolificacy were higher in hCG treated groups compared with control ($p<0.05$). However, fertility did not differ significantly among subgroups. Mean weight of single lambs born was increased in $T_1h$ compared with $T_1C$ and $T_1h$ subgroup had higher P4 concentration compared with $T_1C$ subgroup ($p<0.05$). In Experiment 2; in comparison with control, the hCG increased prolificacy in $h_0$ treatment ($p<0.05$). Mean weight of lambs born was significantly increased in $h_0$ and $h_{12}$ groups compared with control. The hCG increased P4 concentration in $h_0$ and $h_{12}$ group and the $h_{12}$ had higher P4 concentration compare with other groups ($p<0.05$). It can be concluded that hCG injection at AI time increased progesterone concentrations and subsequent could improve reproductive performance in Lory ewes but there were no differences between the ewes treated with 400 or 600 IU PMSG. *(Asian Journal of Animal and Veterinary Advances 4 (1): 9-15, 2009;* ***doi****: 10.3923/ajava.2009.9.15)*

## Effects of Corticosterone Intake as Stress-Alternative Hormone on Broiler Chickens: Performance and Blood Parameters

T. Vahdatpour, K. Nazer Adl, Y. Ebrahim Nezhad, N. Mahery Sis, S.R. Riyazi and S. Vahdatpour

This study was conduced to determine effects of blood corticosterone (CS) increasing on some physiological parameters and performance of boiler chickens. To avoid treatment of birds with various forms of stress with administration of CS a model was developed to study of mimicked stress in chickens. Total 180 one-day old chicks of the cobb-500 strain from male sex were placed in 12 pens. CS at 4 levels (0, 10, 20 and 30 mg $L^{-1}$) in drinking water was provided *ad libitum* between 1 to 49 days of age. Continuous intake of CS for 49 days caused increasing in serum glucose, cholesterol, triglycerides, high and low density lipoprotein and mortality. Final body weight, total feed intake and abdominal fat deposition were decreased, whereas feed conversion ratio was constant. The

relative weights of major immunobiological organs including spleen, thymus and bursa of fabricius were decreased ($p<0.05$). Numerically, weights of selected visceral organs especially liver were elevation in all groups that received higher levels of CS. Therefore, it seems that CS intake is an alternative tool and useful test for assess the effects of physical, psychological and physiological stress in researches on broiler chickens. *(Asian Journal of Animal and Veterinary Advances 4 (1): 16-21, 2009; **doi:** 10.3923/ajava.2009.16.21)*

## Changing of Cell Wall Fractions of Kermes Oak (*Quercus coccifera* L.) in a Vegetation Period and theirs Importance for Pure Hair Goat (*Capra hircus* L.) Breeding in West Mediterranean Region of Turkey

Ahmet Tolunay,Veysel Ayhan and Elif Adiyaman

This study was investigated the change occurring depending on the vegetation period in the Neutral Detergent Fiber (NDF), Acid Detergent Fiber (ADF), Acid Detergent Lignin (ADL), cellulose (CE) and hemicellulose (HEM) of feed fiber characteristics in samples taken in five periods from kermes oak (*Quercus coccifera* L.). According to the results of the research, the values obtained in the analysis conducted on the dry matter based the samples taken on May 15, June 15, July 15, August 15 and September 15, 2008 have been as follows: NDF values - 44.36, 56.05, 58.58, 59.83 and 60.71%; ADF values - 31.14, 39.94, 43.24, 47.49 and 48.03%; ADL values - 14.07, 19.37, 20.02, 24.33 and 24.35%; CE values - 17.06, 20.57, 23.22, 23.16 and 23.68% and HEM values - 13.22, 16.10, 15.33, 12.67 and 12.67% ($p<0.05$). The period when the kermes oak is best in terms of the quality of the feed is the month of June because the quality of the feed increases along with the increase in the NDF value. *(Asian Journal of Animal and Veterinary Advances 4 (1): 22-27, 2009; **doi:** 10.3923/ajava.2009.22.27)*

## The Effect of Ambient Temperature on Thyroid Hormones Concentration and Histopathological Changes of Thyroid Gland in Cattle in Tabriz, Iran

A.P.R. Saber, M.T. Jalali, D. Mohjeri, A.A. Akhoole, H.Z.N. Teymourluei, M. Nouri and S. Garachorlo

To identify the thyroid histological and hormonal changes in response to ambient temperature variations, thyroid glands and blood samples were randomly collected

from 800 indigenous corss-breed cattle of both sex and different age groups from municipal Tabriz slaughter house. The extent of fluctuations in triiodothyronine ($T_3$), thyroxin ($T_4$), $T_3$ uptake and thyroid histopathological lesions were scrutinized in 2 months in year 2007, viz., February (the coldest month) and August (the hottest month). A marked decline was discernable in $T_3$, $T_4$ and $T_3$ uptake in August compared to February. Out of 800 pairs of thyroid glands, 120 (15%) had lesions in which histopathological changes were categorized as follicular atrophy (2.5%), Paranchymal cyst (1.38%), colloid goiter (3.39%), follicular cell hyperplasia (0.27%), thyroid fibrosis(0.635%), focal hyperplastic goiter (0.88%), diffuse hyperplastic goiter additional paranchymal cyst (0.63%). Mean of thyroidal parameters for $T_4$, $T_3$ and $T_3$ uptake was lower in lesioned group ($p<0.01$). The frequency of lesioned thyroid was higher in summer than winter ($p<0.001$). The result of this study showed that high ambient temperature has profound effect on thyroid function, secretion and pathological changes in cattle. *(Asian Journal of Animal and Veterinary Advances 4 (1): 28-33, 2009;* ***doi:*** *10.3923/ajava.2009.28.33)*

## Effect of Oestrus Synchronisation and Body Condition on Reproduction of Anoestrous Ouled Djellal Ewes

T. Madani, F. Chouia and K. Abbas

The objective of this study was to determine the effects of progestagen treatment administrated alone or coupled to an injection of eCG to synchronize oestrus on sheep reproductive traits during the anoestrus season under extensive management conditions of Algeria. Two flocks differing by level of body condition score were used. Fertility rates of treated groups, when compared to control groups, were higher for ewes matted at lean body condition (0.45-0.47 versus 0.10), whereas ewes matted at moderate body condition recorded higher performance during first estrus (0.37-0.45 versus 0.10) and comparable fertility rate for all mating period. Higher prolificacy rates were performed in synchronized groups of poor body condition (1.38 versus 1.00) when compared to control group. For moderate body condition flock, if progesterone and eCG treated ewes performed higher level of litter size than do control ewes (1.54 versus 1.20) for first estrus, prolificacy rate was similar between all groups for all mating period. Extra lambs weaned were significant for lean body condition synchronized groups (0.45) and for moderate body condition progestagen-gonadotropin treated group (0.33). Results indicated that it is possible to increase extra lambs weaned in anestrous Ouled Djellal ewes after artificially induced oestrus. *(Asian Journal of Animal and Veterinary Advances 4 (1): 34-40, 2009;* ***doi:*** *10.3923/ajava.2009.34.40)*

## Investigation of the Effects of Carrying Heavy Load on Prooxidation/ Antioxidant Status and Vitamin $D_3$ in Healthy Horses

E. Ceylan, S. Dede, Y. Değer and I. Yörük

The aim of the study was to investigate the effect of carrying heavy load for a long time on lipid peroxidation (MDA: malondialdehyde), $NO_2$ (nitrite), $NO_3$(nitrate), antioxidants (GSH: reduced glutathione, retinol, α-tocopherol) and vitamin $D_3$ in healthy horses. Blood samples from seventeen native 3-5 years age and 450-500 kg live weight Anatolian horses carried a load which comprised at least 30% of their body weight and for 4 h on mountainous terrain (hard working) were evaluated. Blood samples were collected in the morning before the animals started to carrying load and immediately after they finished carrying (working). It is observed that the level of MDA, $NO_2$ and $NO_3$ increased significantly ($p<0.05$) after working. While GSH concentration, increased after working; levels of retinol, α-tocopherol and vitamin $D_3$ levels decreased significantly ($p<0.05$). On the other hand, the vitamin $D_3$ levels were affected by hard working as other lipid soluble vitamins. There were a correlation between the physiological response to hard-working and some oxidant markers in healthy-hard working horses. These observations provide evidence that hard-working increases oxygen consumption and cause a disturbance of intracellular pro-oxidant-antioxidant homeostasis. *(Asian Journal of Animal and Veterinary Advances 4 (1): 41-46, 2009;* ***doi:*** *10.3923/ajava.2009.41.46)*

## The Case Report of Taillessness in Iranian Female Calf (A Congenital Abnormality)

Alireza Lotfi and Habib Aghdam Shahryar

The aim of this study, is case report of taillessness abnormality in Iranian calves. Taillessness syndrome can be a lethal attribute in animals. In a village in the suburbs of Tabriz, a Northwestern city in Iran, a tailless calf was born. During the examinations and observations, no problem in digestion and faeces excretion was noticed and the calf had a normal growth. There was a small excrescence on the back of the calf where the tail grows. In this recent case, there was no rectal adhesion. The aforementioned calf was born through the Artificial Insemination (AI) of a native female cow with a Holstein bull. The cow is completely healthy

and in her previous parturitions, it has given birth to several healthy calves. Comparing this case with the other reported abnormalities reveals that this anomaly is rare and the probability of its occurrence in female calves of dairy cattle is twice the probability of occurrence in male calves. Most scientific reports have shown that tail abnormalities occur when a native cattle is inseminated with a pure breed cattle such as Holstein. Future study about genetical reasons of Taillessness in native calves may help to solving of this problem, especially in Iranian hybrid (Holstein-native) cattle. *(Asian Journal of Animal and Veterinary Advances 4 (1): 47-51, 2009; **doi**: 10.3923/ajava.2009.47.51)*

## General Performance of Growing Shami Kids Fed High Energy and Protected Methionine

M. Abdelrahman

This experiment was carried out to evaluate the effect of high dietary energy and protected methionine (Smartamine)™ on the growth, feed intake and efficiency and mineral concentrations in blood serum and tissues of shami kids during finishing stage. Fifteen growing shami kids (3 to 4 month old) were distributed equally to three treatments groups as follow: Control (NRC requirements); $T_1$ (High energy 3.0 Mcal ME $kg^{-1}$) and $T_2$ (high energy 3.0 Mcal ME $kg^{-1}$ and 5 g/head/day methionine as Smartamine). Treatment causes a significant change ($p<0.05$) on monthly and overall weight gain. Feeding shami kids high energy significantly increased weight gain, lower feed intake and consequently improve feed conversion. A significantly lower concentrate and alfalfa hay intake were reported in Shami kids fed high energy and protected methionine ($T_2$) when compared with kids from the control and $T_1$. Moreover, dressing and tissues percentages were not significantly affected ($p>0.05$) by treatment, except testicales which was significantly reduced in kids from $T_2$. Magnesium and Cu concentrations in meat were significantly increased ($p<0.05$) in kids fed high energy and methionine when compared with the control. On the other hand, the inorganic matter percentages were significantly reduced with feeding high energy ($T_1$) and high energy with methionine ($T_2$) when compared with the control group. In conclusion, feeding shami kid during the finishing period with high levels of energy improves the total weight gain and total feed conversion. Furthermore, methionine supplementation as Smartamine didn't affect shami kids performance, which means the energy requirements by Shami kids during finishing period is above the recommended levels in NRC for goats. *(Asian Journal of Animal and Veterinary Advances 4 (2): 52-59, 2009; **doi**: 10.3923/ajava.2009.52.59)*

## Effect of Herd Size on Sustainability of Dairy Production

V. Demircan and T. Binici

Data obtained by conducting a survey on 132 dairy farms selected by the stratified random sampling method was used to assess effect of farm size on Cultural Energy (CE) expenditure of dairy cattle production. Dairy cattle farms were divided into three groups according to farm size. Accordingly farm groups were assigned as group 1 (farms that had 1-2 lactating cows, 53 farms), group 2 (farms that had 3-5 lactating cows, 51 farms) and group 3 (farms that had more than 5 lactating cows, 28 farms). Total cultural energy expended included cultural energy expended on feed, dairy operations, transportation, machinery and equipment. Cultural energy expended on feed was similar for farm groups ($p>0.05$) and it constituted more than half of the total cultural energy. As farm size increased cultural energy required producing a kg of milk decreased and group 3 had lower CE requirement than other farm groups ($p<0.05$). Cultural energy expended (Mcal) per Mcal protein energy output was lowest for group 3 ($p<0.05$). Efficiency defined as Mcal input/Mcal output was better for group 3 and differed from other farm groups ($p<0.05$). Results show that as farm size increases efficiency of converting cultural energy into milk increases. Thus in order to be more sustainable in dairying farm size should be increased without interfering cattle performance. *(Asian Journal of Animal and Veterinary Advances 4 (2): 60-65, 2009;* ***doi:*** *10.3923/ajava.2009.60.65)*

## Transcriptional Profiling of Spleen Lymphocyte in Fowl Typhoid of Broilers

H.K. Lim, K. Choi, P.K. Mandal, O. Baatartsogt, C.H. Lee, J.H. Lee and H.B. Kim

This study was carried out to investigate the differentially expressed genome between *S. gallinarum* infected and uninfected control in the spleen lymphocytes of Ross broiler chicks using microarray analysis. GeneChip Chicken Genome Array containing 32,773 transcripts corresponding to over 28,000 chicken genes for simultaneous expression was used. The signal intensity of each gene was normalized and expressed in fold change. A large numbers of genes were found with differential expression majority of which are still unknown in chicken genome. Thirty one known genes were found to have differential expression of which, 25 were up-regulated and 5 were down regulated. Majority of the up-regulated

genes belong to immune response system *viz.*, IL8, IL1B, IL10, IL18, IL17A, IL15, transferrin, IFNg, TLR2, TNFRSF1b, TNFRSF15 and the down regulated genes were B-FIV, B-LA, SDF1, B-LBI, belonging to MHC-I and II and CD1d. To validate the expression of these genes RT-PCR was done using primers of 12 selected genes' with total mRNA isolated from spleen lymphocytes which has confirmed the similar pattern of expression of all the genes as in microarray. The findings in this study have lead to the identification of novel genes which may be useful in further studies to understand the patho-physiology of fowl typhoid towards development of diagnostics and therapeutics. *(Asian Journal of Animal and Veterinary Advances 4 (2): 66-75, 2009;* ***doi:*** *10.3923/ajava.2009.66.75)*

## Influence of Two Sources of Cereals (Corn or Barley), in Free Choice Feeding on Diet Selection, Milk Production Indices and Gaseous Products ($CH_4$ and $CO_2$) in Lactating Sheep

Sabri Yurtseven and Irfan Öztürk

This study was performed to evaluate the effect of different cereal source in choice feeding systems on performance and on emission of carbon dioxide ($CO_2$) and enteric methane ($CH_4$) in dairy Awassi ewes. Total 16 dairy ewes were divided into two groups: the corn based free choice (CFC) group received feed ingredients separately (corn, wheat bran, soybean meal (SBM), cottonseed meal (CSM) and alfalfa hay) and the barley based free choice group (BFC) group received barley instead of corn as carbon hydrate source. The results showed no significant differences ($p>0.05$) between treatments in live weight, live weight gain, milk yield, milk composition and $CO_2$ production. However, the results of $CH_4$ measurement indicated significant differences between groups in the amounts of $CH_4$ produced. The ewes in the CFC group produced less $CH_4$ than the ewes that received the BFC system (CFC: 21.82; BFC: 38.34 g/day/sheep). The results indicate that the CFC system modified ruminal fermentation and affected the Volatile Fatty Acid (VFA) components and levels in ruminal fluid. In ewes on the CFC system, the level of propionate was greatly increased (CFC: 19.77 vs. BFC: 14.53%) and the level of acetate decreased (CFC: 68.34 vs. BFC: 75.58%). Butyrate level was not changed relative to the total VFA components. There were no significant differences in ruminal pH level between treatments. The results indicate that the CFC system has a potential mitigating effect on enteric emission of $CH_4$ but not $CO_2$. *(Asian Journal of Animal and Veterinary Advances 4 (2): 76-85, 2009;* ***doi:*** *10.3923/ajava.2009.76.85)*

## Effects of Green Tea on Mineral Levels of Liver and Testis of Guinea Pigs Electromagnetic Field Emitted by Mobil Phones

D. Kiliçalp, S. Dede, Y. Deger and L. Aslan

It was reported that the effects of green tea on the mineral levels of testis and liver of Guinea pigs exposed to a 900 MHz electromagnetic field. Four experimental groups labeled as controls (Group A), irradiated (Group B), irradiated receiving green tea extract (Group C) and green tea only (Group D) were formed with seven randomly chosen animals of both sexes in each group. After exposure for one month, the animals were sacrificed by decapitation and testis and liver samples were collected for biochemical analysis. In female Guinea pigs irradiation with and without green tea as well as green tea alone caused significant changes of the iron levels in liver, but no significant changes of manganese, copper, zinc and the copper/zinc ratio. In males, irradiation caused significant increases of manganese and a decrease of the iron levels in liver and of manganese, copper, zinc in testis. Combined with green tea, electromagnetic radiation resulted in changes of manganese, iron, copper and copper/zinc ratio in liver and of manganese only in testis. Green tea alone changed the levels of hepatic iron, zinc and copper/zinc ratio and of testicular concentrations of iron and zinc. The highest levels of copper were found in the liver tissue of the irradiated animals that were also treated with green tea. From present findings we can state that testis tissue is more sensitive to electromagnetic radiation than liver tissue, showing greater changes in trace mineral metabolism. Green tea brings the trace element levels to near normal values; supporting the idea that green tea as a supplement has a protective effect against the damaging effects of electromagnetic radiation. *(Asian Journal of Animal and Veterinary Advances 4 (2): 86-92, 2009;* ***doi:*** *10.3923/ajava.2009.86.92)*

## Detection of Avian Influenza Virus Antigen in Chicken Tissues Following Intranasal Inoculation

Mohammad Mehdi Hadipour

To understanding the pathogenicity of H9N2 in broiler chickens, the tissue distribution of viral antigen following intranasal (IN) inoculation of this subtype was studied. Eighteen 3-week-old chickens were inoculated with $10^6 EID_{50}$ per bird with H9N2 avian influenza virus. Then on days 1, 2, 4, 6, 8 and 11 post-inoculation (PI) samples of the trachea, lung, liver, pancreas, spleen, thymus, duodenum, kidney, brain and bursa of Fabricius were collected for immunofluorescence study. The AIV antigen was detected in the trachea, lung and

kidney of inoculated chickens using indirect immunofluorescence technique. The results indicated that the H9N2 avian influenza virus is epitheliotropic in chicken. After IN inoculation it has tissue tropism for trachea, lung (pneumotropic) and kidney (nephrotropic). *(Asian Journal of Animal and Veterinary Advances 4 (2): 93-98, 2009;* ***doi:*** *10.3923/ajava.2009.93.98)*

## The Effects of Different Vegetation Periods on Chemical Composition of Kermes Oak (*Quercus coccifera* L.)

V. Ayhan, A. Tolunay and E. Adiyaman

This study investigates the effect of different vegetation periods on the chemical composition of kermes oak. Five different vegetation periods from May through September 2008 were taken into consideration for this purpose. Throughout these periods, values for dry matter, crude protein, crude lipid, crude fiber, nitrogen-free extracts, crude ash and metabolizable energy were measured. The chemical composition of kermes oak underwent statistically significant changes in connection with the vegetation period ($p<0.05$). During the May, June, July, August and September periods, the natural dry matter content of kermes oak was found to be 43.26, 53.83, 56.85, 57.35 and 57.95%, respectively. During the same periods, values for crude protein with respect to dry matter were 1.27, 1.20, 1.29, 1.47 and 1.59%, respectively, values for crude lipid were 4.37, 3.95, 3.47, 2.69 and 3.73%, respectively, values for crude fiber were 20.88, 30.91, 35.53, 37.21 and 37.08%, respectively, values for nitrogen free extracts were 69.48, 59.98, 55.45, 55.57 and 54.35%, respectively, values for crude ash were 3.99, 3.95, 4.22, 3.05 and 3.25%, respectively and values for metabolizable energy were 3191.65, 3149.65, 3129.35, 3119.92 and 3124.15 kcal $kg^{-1}$, respectively. In conclusion, it was determined that the chemical composition of kermes oak underwent changes in connection with the vegetation period and that, in particular, as the vegetation period advanced, the crude fiber content increased and nitrogen-free extracts decreased. *(Asian Journal of Animal and Veterinary Advances 4 (2): 99-103, 2009;* ***doi:*** *10.3923/ajava.2009.99.103)*

## Determination and Comparison of Nutritional Indices in Commercial Silkworm Hybrids during Various Instars

Alireza Seidavi

The aim of the present study was generate data on *Bombyx mori* feeding and nutritional indices and characteristics during 1st-5th larval instars and comparison

of these parameters among eight commercial hybrids. All insect rearing and experiments were done under special laboratory conditions. The several parameters such as quantity of food consumed, fecal matter excreted and larval growth was determined based on fresh (wet) and dry weight. The experiment was set in a completely randomized design. Also, evaluation index value and sub-ordinate function value were calculated for nutritional indices. From obtained results, gain for total instars (1-5 instars) was maximal in 104×103 (0.67 g DM/larva) and minimum in 151×154 (0.56 g DM/larva). In all the hybrids, ingested food for total larval duration was observed to be above 5.8 g DM/larva. Highest food consumption was recorded in 31×32 (6.31 g DM/larva) followed by 32×31 (6.30 g DM/larva) and 104×103 (6.22 g DM/larva), whereas lowest was recorded in 151×154 (5.80 g DM/larva) followed by 154×151 (5.82 g DM/larva). ECI for total instars (1-5 instars) was maximal in 151×154 (10.35) and minimum in 153×154 (8.37). In all larval duration, approximate digestibility was observed to be above 0.47. Highest AD was recorded in 154×151 (0.507) followed by 153×154 (0.505) and 31×32 (0.504), whereas lowest was recorded in 104×103 (0.475) followed by 103×104 (0.476). After evaluation by both the statistical methods (evaluation index method and sub-ordinate function method), hybrids of 31×32, 104×103 and 32×31 were identified as potential hybrids for further development at distribution between farmers. *(Asian Journal of Animal and Veterinary Advances, 4 (3): 104-113, 2009;* ***doi:*** *10.3923/ajava.2009.104.113)*

## Seroprevalence of Q Fever in Cattle and Sheep in the East of Turkey

Ebubekir Ceylan, Mustafa Berktas, Ihsan Keleş and Zahit Ağaoğlu

The present study was carried out to determine the seroprevalence of antibodies to *C. burnetii* in cattle and sheep in the east of Turkey. Serum samples collected randomly from 92 cattle and 92 sheep were examined by ELISA (Vircell-SL, Spain) to detect IgG antibodies against *C. burnetii* phase II antigen. Seropositivity was observed in 16.3% of the cattle and in 5.4% of the sheep. Coxiellosis has an important seropositivity in both cattle and sheep and it can cause serious health problem in humans living in Eastern Turkey. *(Asian Journal of Animal and Veterinary Advances, 4 (3): 114-121, 2009;* ***doi:*** *10.3923/ajava.2009.114.121)*

## Modeling Lactation Curves of Turkish Saanen and Bornova Goats

Çiğdem Takma, Yavuz Akbaş and Turgay Taskin

Lactation curves of 23 Bornova (25% White German×25% Maltase×50% Anglo-Nubian crossbreed) and 37 Turkish Saanen dairy goats were estimated in this study. Individual 427 test-day milk yields were recorded monthly from lambing to drying off. The Wood (WD) and Cobby and Le Du (CL) models were applied to estimate lactation curve parameters of the two breeds. The WD model had greater a parameter (average milk yield at the beginning of the lactation) than CL model. The difference between breeds was significant ($p<0.05$) for the b parameter related to slope up to peak yield. The two models estimated significantly different pattern of the decline in milk production. Coefficient of determination values ($R^2$) of the models were high and ranged from 0.83 to 0.91. The CL model showed better performance than WD model. Lactation curve characteristics including Peak Yield (PY), Time to Peak Yield (TPY), Total Milk Yields (TMY) and Persistency (P) were also estimated using WD, CL and Fleischmann (FL) methods. WD and CL models forecasted higher PY and earlier TPY in comparison with the FL. TMY and P from two models were lower than those from FL. The effect of breed was significant ($p<0.05$) on TPY. Correlation coefficients among lactation curve characteristics were ranged from -0.29 to 0.78. The results suggest that CL model was better for the fitting of the test-day milk yields of Turkish Saanen and Bornova goats. *(Asian Journal of Animal and Veterinary Advances, 4 (3): 122-129, 2009;* ***doi:*** *10.3923/ajava.2009.122.129)*

## Allelic Frequencies of a *Sac*II RFLP at Exon 7 of the β-lactoglobulin Gene in Turkish Hair Goat Breed

C. Elmaci, Y. Oner and M. Koyuncu

Polymorphism in the exon 7 to the 3' flanking region of β-lactoglobulin (β-lg) gene in Turkish hair goat populations were investigated. The study was carried out including 233 hair goats using PCR-RFLP. Digestion of amplification product with *Sac*II restriction enzyme revealed two alleles namely $S_1$ and $S_2$ (which was produced by a single nucleotide substitution) and three genotypes ($S_1S_1$, $S_1S_2$ and $S_2S_2$) in the studied population. The genotypic frequencies of $S_1S_1$ and $S_1S_2$ were almost equal. $S_2S_2$ genotype was found to be lower than other genotypes

($S_1S_1$ and $S_1S_2$) in the studied population. The allele frequencies of $S_1$ and $S_2$ at β-lg locus were 0.67 and 0.33 in hair goat population, respectively. Deviation from Hardy-Weinberg equilibrium was not detected. *(Asian Journal of Animal and Veterinary Advances, 4 (3): 130-133, 2009;* ***doi:*** *10.3923/ajava.2009.130.133)*

## The Efficacy of Moxidectin Against Gastrointestinal Nematode Infections in Goats

C. Ragbetli, E. Ceylan and P. Tanritanir

The aim of this study was to examine the efficacy of moxidectin treatment on goats naturally infected with gastrointestinal nematodes in Van region, Turkey. Two hundred and forty goats infected with gasterointestinal parasites were treated with 0.2 mg $kg^{-1}$ moxidectin (Cydectin, Abfar), subcutaneously. Ten randomly selected goats were not treated and allocated as a control group. Faecal samples were examined for gastrointestinal parasites qualitatively and quantitatively (EPG) in 0th, 7th and 14th days of treatment. Larvae of the parasite species of *Ostertagia*, *Haemonchus*, *Nematodirus* and *Trichostrongylus* were detected in the coprocultures of the infected animals performed before treatment. It was observed that moxidectin was 100% effective against the gastrointestinal ematodes. *(Asian Journal of Animal and Veterinary Advances, 4 (3): 134-138, 2009;* ***doi:*** *10.3923/ajava.2009.134.138)*

## Effects of Dietary Ascorbic Acid Supplementation on Growth Performance, Carcass, Bone Quality and Blood Parameters in Broilers During Natural Summer Temperature

Y. Konca, F. Kirkpinar, S. Mert and S. Yurtseven

This experiment was conducted to determine dietary supplementation of ascorbic acid (ASA) on the performance, carcass, bone traits and, some serum indices of broilers. A total of 180 day-old chicks were distributed into 3 treatment groups with 6 replicate containing 10 chicks each. The experimental diets were: (1) control, no dietary ASA supplementation (ASA0), (2) dietary ASA supplementation 150 mg $kg^{-1}$ (ASA150) of diet and (3) 300 mg $kg^{-1}$ of diet (ASA300). The experiment was lasted up to 42 days of age. Dietary ASA did not affect body weight and gain and feed conversion ratio but quadratically changed daily feed intake of broilers at 21-42 and 0-42 days of age ($p<0.05$). The carcass

and parts yields, dry matter, crude protein and pH of meat and bone traits were not affected ($p>0.05$) but crude fat and thigh meat colour were linearly changed ($p<0.05$) by the dietary supplement. Dietary ASA supplementation quadratically changed the serum alanine aminotransferase and linearly decreased aspartate amino transferase ($p<0.05$) but did not affect other serum constituents. To conclude, dietary ASA supplementation have some beneficial effects on broiler meat composition and colour and serum AST and ALT levels during natural summer temperature. *(Asian Journal of Animal and Veterinary Advances, 4 (3): 139-147, 2009;* ***doi:*** *10.3923/ajava.2009.139.147)*

## Biomarkers Identified by Proteomic Study of Spleen Lymphocyte from Broilers Infected with *Salmonella gallinarum* after Feeding Korean Mistletoe (*Viscum album coloratum)*

Hyun-Kyung So, P.K. Mandal, O. Baatartsogt, Hee-Kyong Lim, Chi-Ho Lee, Jun-Heon Lee and Kangduk Choi

To find the alternative for antibiotic this study was carried out to investigate the differentially expressed proteome between *Salmonella gallinarum* infected and uninfected control in the spleen lymphocytes of ROS broiler chicks fed with Korean mistletoe using proteomic approach. Total four protein spots were detected with differential expression from the chicken spleen lymphocyte in 2DE gels after silver staining. These proteins were characterized by MALDI-TOF MS and MS/MS. Two known proteins were up-regulated *viz.*, Fatty Acid Binding Protein (FABP) and MRP-126 and 2 proteins were down regulated *viz.*, ribosomal protein12, pyruvate kinase. In this experimental fowl typhoid infection in broilers fed with Korean mistletoe through proteomics approach significant differential expression of four proteins were found which appears to be candidate molecules for fowl typhoid. *(Asian Journal of Animal and Veterinary Advances, 4 (3): 148-159, 2009;* ***doi:*** *10.3923/ajava.2009.148.159)*

## Effects of Microbial Phytase on Animal Performance, Amount of Phosphorus Excreted and Blood Parameters in Broiler Fed Low Non-Phytate Phosphorus Diets

N. Tugba Bingol, M. Akif Karsli, D. Bolat, I. Akca and T. Levendoglu

The aim of the current study was to evaluate the effects of a microbial phytase on broiler performance, mineral retention and mineral excretion in broilers fed corn-soybean meal-barley based diet with low available phosphorus level. A total

of 300 one day-old Ross 308 broilers were allotted into 5 treatment groups consisted of 4 subgroups. This basal diet (negative control) was supplemented with enzyme (Rovabio; control). Then, control diet was supplemented with 500 g $ton^{-1}$ microbial phytase (Rovaphos; 500 g phytase), 1000 g $ton^{-1}$ microbial phytase (1000 g phytase) and 1500 g $ton^{-1}$ microbial phytase (1500 g phytase). Body weight of broiler fed low available phosphorus diets supplemented with phytase were significantly higher ($p<0.05$) compared with broilers fed low available phosphorus diet without phytase throughout the experiment starting from second week of experiment. Broilers fed negative control diet had significantly less carcass weights compared with other groups ($p<0.05$). Addition of phytase linearly increased serum P levels and decreased amount of P excreted in feces. It can be concluded that dietary available phosphorus can be reduced up to 30% in broiler diet with 1000 g phytase/ton supplementation without affecting animal performance. *(Asian Journal of Animal and Veterinary Advances, 4 (3): 160-166, 2009;* ***doi:*** *10.3923/ajava.2009.160.166)*

## Determination of Silage Quality, Herbage and Hay Yield of Different Triticale Cultivars

B. Kara, V. Ayhan, Z. Akman and E. Adiyaman

This study was carried out to determine silage quality, herbage and hay yield of different triticale cultivars (Tacettinbey, Tatlicak-97 and Karma-2000). In the research, besides herbage and hay yield of triticale cultivars, dry matter, organic matter, crude protein, crude lipid, crude fiber, nitrogen-free extract and crude ash, silage pH, flieg point, metabolizable energy and physical quality of triticale silage were examined. Among the cultivars, while the highest herbage yield (22860 kg $ha^{-1}$), hay yield (14270 kg $ha^{-1}$), dry matter (43.4%), crude protein content (8.3%), crude lipid (2.91%), crude fiber (27.1%), flieg point (127.8) and the best pH value (4.1) were observed in Karma-2000 cultivar, physical characteristics such as smell, structure and color of the cultivars were similar among cultivars. *(Asian Journal of Animal and Veterinary Advances, 4 (3): 167-171, 2009;* ***doi:*** *10.3923/ajava.2009.167.171)*

## The Significance of Vasoactive Intestinal Peptide in the Treatment of *Schistosoma mansoni*-Infected Diabetic Mice

Osama M. Ahmed and Gamal Allam

The effect of Vasoactive Intestinal Peptide (VIP) on Insulin Dependent Diabetes Mellitus (IDDM) and schistosomiasis together in combination has not been

previously investigated. To assess its efficacy in such condition, VIP was administered to *Schistosoma mansoni*-infected streptozotocin-induced diabetic (ID) mice at a dose level of 41.6 ng $kg^{-1}$ b.wt., 3 times/week, for 8 consecutive weeks starting from the 1st week of infection. The administration of VIP to ID mice induced a potential amelioration of serum glucose, insulin and C-peptide levels indicating the insulinogenic effect of this peptide. VIP also produced a significant decrease of hepatic granuloma volume and worm fecundity in the ID mice without affecting worm burden. The granuloma volume was found to be lower in the ID mice as compared to that of the infected non-diabetic ones. VIP administration produced marked decreases of the elevated liver collagen, serum carbohydrate antigen (CA.19.9) and liver alpha fetoprotein (AFP) content of ID mice as well as it succeeded, at least partially, to alleviate the altered liver enzyme activities. It also successfully increased the anti-inflammatory cytokine, IL-10 and decreased the elevated pro-inflammatory chemokines, IL-12 and TNF-α level in the serum of ID mice. These changes in cytokines explain the decrease in hepatic granuloma volume and reflect the anti-inflammatory effects of VIP. The increased oxidative stress markers and perturbed antioxidant defense system were profoundly improved in the ID mice treated with VIP. In conclusion, the VIP may have anti-hyperglycemic and insulinotropic effects, decrease liver and intestinal egg count and ameliorate liver pathologic deteriorations via its immunomodulatory effects on cytokines released from macrophages and T helper cells in addition to its improvement effect on the antioxidant defense system of the infected diabetic mice. *(Asian Journal of Animal and Veterinary Advances 4 (4): 172-190, 2009;* ***doi:*** *10.3923/ajava.2009.172.190)*

## Evaluation of a Mixture of Thiopental-Guafinesine-Metedomidine and Sevoflurane Anesthesia in Horses

N. Atasoy, N. Mercan, C. Atalay, E. Bayram and A. Taş

The anesthetic and cardiopulmonary effects of a combination of continuous intravenous infusion using a mixture of 6 g $L^{-1}$ thiopental-75 g $L^{-1}$ guafinesine-3 mg $L^{-1}$ metedomidine (0.30 mL/kg/h) and Oxygen-Sevoflurane (OS) anesthesia (TGM-OS anesthesia) in horses were evaluated. The concentration of sevoflurane (Sevo) required maintaining surgical anesthesia was around 1.5% in TGM-OS and 3.3% in OS anesthesia. Mean Arterial Blood Pressure (MABP) was maintained at around 77 mm Hg under TGM-OS anesthesia, while dobutamine (0.43±0.13 μg $kg^{-1}$) infusion was necessary to maintain MABP at 60 mmHg under OS

anesthesia. No apparent complication was observed during and after anesthesia in all cases. Recovery from anesthesia under TGM-OS anesthesia was very calm and smooth. The times required for the horse to return both sternal and standing position in group under TGM-OS anesthesia tended to be shorter than group under OS anesthesia which statistical differences were $p<0.05$ and $p<0.01$, respectively. Thiopental Guafinesine-Metedomidine and Oxygen-Sevoflurane anesthesia (TGM-OS anesthesia) may be useful for prolonged equine anesthesia because of its minimal cardiopulmonary effects and good recovery from anesthesia. *(Asian Journal of Animal and Veterinary Advances 4 (4): 191-199, 2009;* ***doi:*** *10.3923/ajava.2009.191.199)*

## *In situ* Rumen Degradability, *in vitro* Digestibility and *in vitro* Gas Production of Full Fat Canola Seeds

U. Kilic and A.V. Garipoglu

The objective of this study was to determine the chemical composition, *in vitro* gas production, *in vitro* digestibility and *in situ* rumen degradability of canola hybrids. In the study, canola seeds of four different hybrids (Bristol, Eurol, Capitol and Licrown), which were obtained from the Institute of Karadeniz Agricultural Research in Samsun, Turkiye were used. Two rams aged 2 years with permanent ruminal fistulated were used in gas production and *in situ* nylon bag techniques. All of the feedstuffs were incubated for 3, 6, 9, 12, 24, 48, 72 and 96 h in *in vitro* incubations for gas production. Feedstuffs were incubated for 48 h in nylon bag technique. The results of the present study suggested that there were no differences among the hybrids in terms of feed value. All of the hybrids had low *in vitro* gas production values due to their high fat contents. Licrown variety had the lowest production level up to 48 h of the incubation, but there were no differences after 24 h of the incubation ($p>0.05$). There were not significant differences among the hybrids in terms of estimated parameters except for gas production rate (c). The gas production rate of Licrown was significantly ($p<0.05$) lower than that of Bristol. While, *in vitro* enzyme digestibility Dry Matter Digestibility (DMD), Organic Matter Digestibility (OMD) and Metabolisable Energy (ME)) was not different among the hybrids ($p>0.05$), rumen degradabilities Dry Matter Degradability ($DMD_{48}$), Organic Matter Degradability ($OMD_{48}$) and Crude krotein Degradability ($CPD_{48}$) were significantly different ($p<0.01$). *(Asian Journal of Animal and Veterinary Advances 4 (4): 200-208, 2009;* ***doi:*** *10.3923/ajava.2009.200.208)*

## Comparative Study of Fatty Acid Composition of Golden Mullet Fillet and Roe Oil (*Liza aurata* Risso, 1810)

Masoud Hedayatifard

In the present study, the fatty acid compositions of golden mullet fillet and roe oil were determined. Palmitic acid (C16:0) was the dominant saturated fatty acid in golden mullet fillet and roe oil with 14.39 and 6.45%, respectively. The major unsaturated fatty acids of golden mullet fillet oil, were detected as palmitoleic acid (C16:1, 17.32%), oleic acid (C18:1, 17.09%) and α-linolenic acid (C18:3, 8.72%). The most abundant unsaturated fatty acids of roe oil were determined as palmitoleic (C16:1, 21.33%), oleic (C18:1, 19.51%), α-linolenic (C18:3, 7.34%), Linoleic acid (C18:2, 6.77%) and docasahexaenoic acid (C22:6, 6.35%). The total unsaturated fatty acids of roe oil (68.59%) were higher than that of golden mullet fillet oil (56.37%). Amounts of ω-3 unsaturated fatty acids in the roe and fillet oil were 19.52 and 14.51%, respectively. Furthermore, the total amounts of eicosapentaenoic acid (C20:5) and docasahexaenoic acid (C22: 6) of roe oil were nearly 2 times higher than those of the golden mullet fillet. Further, the lipid percentage and the amounts of C14:0, C16:0, C18:2, C18:3, C20:5 and C22:6 fatty acids differed significantly ($p<0.05$) between fillet and roe oil. In addition, significant differences were observed among ω-3 and ω-6 series between both fillet and roe oil. *(Asian Journal of Animal and Veterinary Advances 4 (4): 209-213, 2009;* ***doi:*** *10.3923/ajava.2009.209.213)*

## Carcass Characteristics and Economic Benefits of Weaner Rabbits Fed Cassava Tuber Meals

J.S. Ekpo, I.P. Solomon, L.J. Isaac, K.O. Ekpo and O.O. Leo

An eleven-week research was conducted to evaluate the carcass characteristic and economics of production of rabbit fed cassava peel meal, peeled cassava tuber meal and composite cassava tuber meal diets. Twenty-four weaner rabbits of mixed strains and sexes aged 6 to 7 weeks randomly allotted to four dietary treatments replicated two times each with 3 rabbits per replicate in a completely randomized design. The parameters studied were final live-weights, dressed weight, dressing percentage, internal organs weights, feed cost (N $kg^{-1}$), total feed cost (N), feed cost (N $kg^{-1}$ gain) and relative cost advantage (%). There was no significant difference ($p>0.05$) in the final live weights, dressed weights, dressing percentage and in most of the internal organs measured. However, economic of

production data indicated lowest cost per weight gain (N $kg^{-1}$) by the rabbits fed composite cassava tuber meal, while highest cost per weight gain was recorded in the rabbits fed the control diet (maize meal). *(Asian Journal of Animal and Veterinary Advances 4 (4): 214-218, 2009;* ***doi:*** *10.3923/ajava.2009.214.218)*

## The Effect of Delayed Ensiling and Application of an Organic Acid-based Additives on the Fermentation of Corn Silage

S. Arbabi, T. Ghoorchi and S. Hasani

The main objective of this study was to determine the effects of organic acid-based additives on the fermentation and delayed ensiling of corn silage. Prolonged exposure to air can adversely affect the silage fermentation process. To investigate a possible method to overcome this problem, we found that when a buffered propionic acid-based additive, is applied to chopped, whole-plant corn exposed to air before ensiling, it will affect the subsequent fermentation. Chopped whole plant corn mixed with 4 different additives consist of propionic acid in addition to control treatment without any additive. Additives were: (1) propionic acid, (2) propionic acid (85%)+formic acid (15%), (3) calcium propionate and (4) propionic acid (80%)+formic acid (15%)+ammonia (5%). The 10 g $kg^{-1}$ dry matter of each additives mixed with chopped corn forage in 3 different times (0 (immediately), 24, 48 h). Silages were assessed by the method of appearance evaluation and DM, pH evaluation. CP, NDF, ADF, TVFA, WSC, so that, the aerobic stability and DM degradation of each treatment were determined after 60 days. Silages that exposed to air for 24 h, before ensiling had better appearance quality than two other delaying time (0 and 48 h) in Filg's method and whole additives in this experiment had good effects on appearance quality in comparison with control group. All of silages containing buffered propionic acid-based additive, in method of DM, pH evaluation, were good and very good. These silages had lower ($p<0.05$) pH than control ones. Amount of dry matter of control silage which ensiled immediately was lower than other treated silages. NDF in control silages (without additive) was more than that in treated silages and amount of CP and TVFA increased with addition of additives especially those containing propionic acid (85%)+formic acid (15%) ($p<0.05$). WSC in control silage that wilted 48 h before ensiling was more than other samples ($p<0.05$). Buffered propionic acid-based additives increased aerobic stability in treated silages in comparison with untreated ones. Degradation of DM (*in situ*) for untreated silages that delayed ensiled was lower. Application of the additive containing propionic acid (80%)+ formic acid (15%)+ammonia (5%) resulted in

highest degradation of dry matter among experimental additives. Generally, treatment with propionic acid-based additives prevented a decrease in DM degradation (*in vitro*). *(Asian Journal of Animal and Veterinary Advances 4 (5): 219-227, 2009;* ***doi:*** *10.3923/ajava.2009.219.227)*

## The Effects of Different Caponization Age on Growth Performance and Blood Parameters in Male Tibetan Chicken

Yonggang Shao, Changxin Wu, Junying Li and Chunjiang Zhao

In this experiment, forty triplets consisting of full-sib Tibetan Chicken cockerels were divided equally into two trial groups. In each group, the triplets were randomly assigned to caponization, sham treatment and intact groups. The birds of the two trials were caponized or sham-operated at either 6 weeks of age (early) or 18 weeks of age (late) and slaughtered at 24 weeks of age. The birds in the early caponization group showed significant increases in terms of intermuscular fat deposits, subcutaneous fat thickness, liver weight, triacylglycerol concentration ($p<0.05$) and abdominal fat weight ($p<0.01$) at 24 weeks of age compared with the intact and sham groups, while later caponization resulted in significant increase in liver weight, abdominal fat weight, total cholesterol and triacylglycerol concentrations ($p<0.05$). In both trials, the capons exhibited lower leg muscle weight than did the intact ($p<0.05$). There were no significant effects on breast muscle weight on either the early or late caponization group. We concluded that late caponization accelerates the rate of fat deposition within the abdominal cavity compared to other areas after sexual maturity. Present results also suggest that the role of androgen on the growth of breast muscle is different from that on leg muscle in Tibetan Chicken cockerels. It seemed that the positive effects of androgen were reflected only on leg muscle growth. *(Asian Journal of Animal and Veterinary Advances 4 (5): 228-236, 2009;* ***doi:*** *10.3923/ajava.2009.228.236)*

## DNA Polymorphism of Indigenous Chickens in Jordan

Raed M. Al-Atiyat

DNA polymorphism of four indigenous chicken ecotypes was assessed in Jordan using Random Amplified Polymorphic DNA (RAPD) markers. Ten RAPD markers showed high genetic polymorphism values in the 4 ecotypes located in the Northern, Eastern, Western and Southern provinces of Jordan. The effective number of alleles per locus ranged from 1.47 to 1.7 (mean 1.65). The expected heterozygosity varied from 0.28 to 0.41 (mean 0.39) and Shannon's index from

0.42 to 0.60 (mean 0.58). The Western ecotype showed higher levels of effective allele number, expected heterozygosity and Shannon's index than the others. The genetic similarity between the Northern, Eastern and Western ecotypes ranged from 0.95 to 0.97, while it ranged from 0.69 to 0.85 between the Southern ecotype and the others. The largest genetic distance was found between the Northern and Southern ecotypes (0.37), whereas the smallest (0.04) was between the Northern and Eastern ecotypes. The Southern ecotype was found to be the most genetically distant among all ecotypes. Based on the results, the RAPD markers were effective in detecting genetic diversity in the chicken ecotypes, representing valuable results for genetic conservation purposes. *(Asian Journal of Animal and Veterinary Advances 4 (5): 237-244, 2009;* ***doi:*** *10.3923/ajava.2009.237.244)*

## Effects of Lameness, Stage of Lactation and Body Condition Scoreon Some Blood Parameters in Holstein Cows

E. Yaylak, Ç. Yenisey and K. Seyrek

Effects of lameness, stage of lactation and body condition score on serum AST and ALT activities as well as serum total protein, triglyceride, cholesterol and albumin concentrations in cows was investigated in the present study. Fifty six pure Holstein cows were included in this study. AST, ALT and cholesterol levels were significantly altered by stages of lactation ($p<0.05$). Total protein, triglyceride, AST, ALT, cholesterol and albumin levels were low at early stages of lactation and dry periods; in the course of time, their concentrations increased. However, in late stages of lactation, serum total protein, triglyceride, AST, ALT, cholesterol and albumin levels declined. No significant alterations were detected in the blood parameters of lame cows. However, AST, ALT and albumin levels were low in cows with a lameness score of 4. Likewise, blood parameters were not affected by body condition. Triglyceride, AST, cholesterol and albumin levels are high in cows with higher body conditions ($\geq 2.75$). *(Asian Journal of Animal and Veterinary Advances 4 (5): 245-251, 2009;* ***doi:*** *10.3923/ajava.2009.245.251)*

## Genetic Polymorphisms of α-lactalbumin and β-lactoglobulin in South Anatolian and East Anatolian Red Cattle

H. Yardibi, G. Turkay, A. Mengi, F. Kaygısız and K. Oztabak

The objective of the present study was to determine the genotype and allele frequencies for alpha-lactalbumin (α-LA) ve β-lactoglobulin (β-LG) that are

claimed to be associated with milk production traits in cattle in South Anatolian Red (SAR) and East Anatolian Red (EAR) cattle. In this study, 40 cattle for each of SAR and EAR were used. Genomic DNA samples were isolated by using standard salt-out method. After Polymerase Chain Reaction (PCR), α-LA and β-LG genes were digested with *Msp*I and *Rsa*I (R5), *Ava*I (R3), *Msp*I (R1), *Sau*3A (R2) restriction enzymes, respectively. As a result, SAR and EAR cattle breeds have the lower allel frequencies for α-LA and β-LG gene than high-yielding European dairy cattle breeds. Because of that reason we may claim that applying the selection programs for developing the allels belonging to both genes may contribute to the trials to improve the production parameters in SAR and EAR breed bovines. *(Asian Journal of Animal and Veterinary Advances 4 (5): 252-257, 2009;* ***doi:*** *10.3923/ajava.2009.252.257)*

## PCR-Based Detection of *Yersinia ruckeri* Infection in Rainbow Trout Fish

M.R. Roozbahani, M. Bandehpour, A. Haghighi- Khiabanian-Asl, H. Abdollahi and B. Kazemi

The aim of this study was designing a diagnostic kit for yersiniosis in the trout fish in Iran. Colonies of *Yersinia ruckeri* were collected from culture medium and a suspension was prepared in a lysing solution. DNA was extracted through a boiling and phenol chloroform method. Two primer sets targeting bacterial 16S rRNA and trout 18S rRNA. Polymerase chain reaction products were separated by gel electrophoresis. Among 20 suspected samples tested two samples were positive for both host and bacterial PCRs indicating the positive *Y. ruckeri* infection and remaining 18 samples were negative for pathogen. The performance of PCR reactions in negative samples were confirmed from amplification of internal control reactions targeting host. A PCR based diagnostic kit with an internal control was prepared for detection of *Yersinia ruckeri* in rainbow trout fish. *(Asian Journal of Animal and Veterinary Advances 4 (5): 258-262, 2009;* ***doi:*** *10.3923/ajava.2009.258.262)*

## *Neospora caninum* Antibodies and its Consequences for Reproductive Characteristics in Wandering Sows from Senegal, West Africa

A.R. Kamga-Waladjo, G. Chatagnon, S.N. Bakou, H. Boly, P.E.H. Diop and D. Tainturier

The aim of this study was to assay *Neospora canimum* antibodies and assess their consequences in terms of reproductive characteristics in wandering sows from

Senegal, West Africa. Sera of 60 sows were assayed for antibodies against *N. caninum*. The associations between serostatus and reproductive characteristics were assessed over a period of 3 years (2006-2008). The 58.3% of sera were positive to *N. caninum* antibodies. Some reproductive disorders as age of sow at first birth, annual number of deliveries and stillbirths were significantly associated with serostatus of *N. caninum* ($p<0.05$). Results of this preliminary study indicate a higher prevalence of *N. caninum* in wandering sows from Senegal and there appeared to be an association between reproductive disorders and seropositivity. Thus, neosporosis may explain the lower reproductive performance in species from Africa. This has to be taken in account in epidemiology and impact of this new disease in African sows. *(Asian Journal of Animal and Veterinary Advances 4 (5): 263-266, 2009;* ***doi:*** *10.3923/ajava.2009.263.266)*

## Cellular and Humoral Immune Responses and Antigen Recognition in Sprague-Dawley Rats Experimentally Infected with *Brucella abortus* Biotype 1

M.M. Khatun, M.A. Islam, B.K. Baek and S.I. Lee

The study was undertaken to investigate the cellular and humoral immune responses as well as antigen recognition in the acute and sub-acute stages of *Brucella abortus* biotype 1 infection in Sprague-Dawley (SD) rats. The SD rats were infected intraperitoneally with $1\times10^{10}$ colony forming unit (cfu) of *B. abortus* biotype 1 Korean bovine isolate. The cellular and humoral immune responses were measured at 0, 3, 7, 14, 21, 28, 35, 42, 60, 90 and 120 days after infection against Crude Brucella Protein (CBP) by Lymphocyte Proliferation Assay (LPA) and Indirect Enzyme-linked Immunosorbent Assay (IELISA). The experimentally infected rats developed specific lymphoproliferative and humoral immune response within 1 week post infection. A significant increase in the proliferative response to CBP was recorded on day 28 post infection. *Brucella abortus* specific IgG responses were initiated in SD rats at 3 days after infection. The highest IgG antibody titers were recorded at 35 days after infection and then the titer gradually decreased until the end of the experiment. Recognition of immunodominant antigens in CBP of *B. abortus* was performed by Western Blot (WB) assay using infected rat sera collected at 0, 3, 7, 14, 21, 28, 35, 42, 60, 90 and 120 days after infection. Western blot assay of the sera using CBP antigens revealed a wide array of protein bands between molecular weight of 19 and 125 kDa. Proteins of 125, 105, 82, 66, 54, 46, 32, 24, 22, 21 and 19 kDa were frequently recognized by the sera of infected rats during the experiment. The 82, 46, 32, 24, 22, 21 and 19 kDa proteins were intensely recognized during the course of infection. These

antigens should be considered useful for the diagnostic of *B. abortus* infection. *(Asian Journal of Animal and Veterinary Advances 4 (6): 267-277, 2009;* ***doi:*** *10.3923/ajava.2009.267.277)*

## Effect of Different Feeding Method on Methane and Carbon Dioxide Emissions Milk Yield and Composition of Lactating Awassi Sheep

Sabri Yurtseven, Mehmet Cetin, Irfan Öztürk, Abdullah Can, Mustafa Boga, Tekin Şahin and Hüseyin Turkoglu

This study was performed to evaluate the effect of different feeding systems (choice feeding and conventional system) on performance and emission of carbon dioxide ($CO_2$) and enteric methane ($CH_4$) in dairy Awassi ewes. One chamber was equipped with gas analyzers to measure $CH_4$ and $CO_2$ for 23 h $day^{-1}$. In total, 16 ewes were used. The ewes were divided into two groups: the Free Choice (FC) group received feed ingredients separately and the Total Mixed Ration (TMR) group received a standard mixed concentrate: forage diet in a ratio of 60:40. The results showed no significant differences between treatments in performance parameters. However, the results of $CH_4$ and $CO_2$ measurement indicated significant differences between groups in the amounts of $CH_4$ and $CO_2$ produced per kg dry matter intake. The ewes in the FC group produced less $CH_4$ per animal than the ewes that received the TMR system. In ewes on the FC system, the level of propionate was greatly increased relative to the total VFA components. There were no significant differences in ruminal pH and acetate level between treatments. The results indicate that the FC system may be a potential mitigating effect on enteric emission of $CH_4$ and $CO_2$. *(Asian Journal of Animal and Veterinary Advances 4 (6): 278-287, 2009;* ***doi:*** *10.3923/ajava.2009.278.287)*

## Isoflavone Aglycone from Fermented Soy Pulp Prevents Osteoporosis in Ovariectomized Rats

Go-Eun Hong, P.K. Mandal, Chang-Won Pyun, K. Choi, Soo-Ki Kim, Kyu-Ho Han, M. Fukushima, Ho-Chul Shin and Chi-Ho Lee

This study was done to investigate the effects of fermented soy pulp on the osteoporosis in ovariectomized rats. Sprague-Dawley female rats were randomly assigned to four groups as Sham Control (SC), Ovariectomized Control (OC), Ovariectomized and Soy Pulp (OSP) fed and Ovariectomized and Fermented Soy Pulp (OFSP) fed. All rats were fed on purified diets, supplemented with non-

fermented and fermented soy pulp on basic diet for 7 weeks. It was observed that isoflavone aglycone was very high in soy pulp fermented for 12 h in comparison to non-fermented soy pulp. Body weight of the rats increased significantly ($p<0.05$) in comparison to other groups. Atrophy of uterus in OFSP group was significantly ($p<0.05$) prevented in comparison to OC group. The concentration of estradiol in OFSP group was higher than those of OC and OSP groups. The bone density in OFSP group was significantly ($p<0.05$) higher than those of OC and OSP groups. The histopathology indicated that OFSP group has better retarded the progress of osteoporosis than other groups. The results showed that isoflavone from the fermented soy pulp has prevented the osteoporosis in ovariectomized rats must be due to its estradiol like function. It is expected that the fermented soy pulp might serve as a functional food in osteoporosis of postmenopausal women. *(Asian Journal of Animal and Veterinary Advances 4 (6): 288-296, 2009;* ***doi:*** *10.3923/ajava.2009.288.296)*

## Gross Sign, Histopathology and Polymerase Chain Reaction Observations of White Spot Syndrome Virus in Shrimp Specific Pathogen Free *Litopeneaus vannamei* in Iran

M. Afsharnasab, R. Mortezaei, V. Yegane and B. Kazemi

The importation of *Litopenaeus vannamei* to Iran from Hawaii was initiated when Iranian shrimp culture was first affected by WSSV in 2004. The main reason for the importation of *L. vannamei* to Iran was the disease susceptibility and mass mortality of the indigenous species (*P. indicus*) when faced with the first outbreak of WSSV. During the two years of study, it was found out that culturists in Iran preferred cultured *L. vannamei* than the local species (*P. indicus*). In 2008, mass mortality occurred in farmed *L. vannamei* in Khuzestan Province South of Iran. Two hundred shrimps with white spot on the carapace and body were collected and preserved in Davidson fixative for histopathology. A part of samples collected were also preserved in 95% ethyl alcohol for Polymerase Chain Reaction (PCR) technique. Two pair primers from VP24 WSSV genome was identified and used for PCR while identified one pair primer for 18SrRNA gene of shrimp was used as house keeping gene in PCR reaction in both positive and negative PCR reaction. Grossly, the samples showed white spot in the cuticle and body surface and red color on the appendages. Histopathologically, all tissue except hepatopancreas showed the intranuclear Cowdry type-A inclusion bodies. PCR studies using designated primer revealed a band of 414 bp from WSSV and 809 bp of shrimp DNA fragments in positive samples. The negative samples showed just 809 bp. This is the first report of White Spot Syndrome Virus (WSSV) in farmed *L. vannamei* in Iran. *(Asian Journal of Animal and Veterinary Advances 4 (6): 297-305, 2009;* ***doi:*** *10.3923/ajava.2009.297.305)*

## Comparison of Electroanesthesia with Chemical Anesthesia (MS222 and Clove Oil) in Rainbow Trout (*Oncorhynchus mykiss*) using Plasma Cortisol and Glucose Responses as Physiological Stress Indicators

A. Sattari, S.S. Mirzargar, A. Abrishamifar, R. Lourakzadegan A. Bahonar, H.E. Mousavi and A. Niasari

This study investigates Alternating Current (AC) electroanesthesia of rainbow trout (*Oncorhynchus mykiss*) in comparison with MS222 and clove oil, using plasma cortisol and glucose concentrations as stress assessment indicators. A microcontroller-based apparatus was designed and constructed to allow a programmable voltage-time Pulse-Width Modulated (PWM) electrical wave application through 19×20 cm submersible electrodes for 91sec in a 33 cm long tank to induce loss of equilibrium and immobility with recovery after 52±27 sec. Recovery after 660±102 sec was observed in MS222-anesthetized fish (after induction for 720±72 sec) and a recovery time of 546±102 sec was observed in clove oil-anesthetized fish (after induction for 144±42 sec) both are significantly longer recovery times in comparison with electroanesthesia ($p<0.001$). Using direct enzyme-linked immunosorbant assay (ELISA) for cortisol and enzymatic colorimetric assay for glucose assessments at 0, 1, 6, 12 h after each anesthesia, the anesthetics indicated similar trend of cortisol responses during 12 h of investigation. The dilatory trend of glucose changes and response derived from anesthetics and electricity and its surge at 6 h after anesthesia ($p<0.05$) confirmed glucose as a second order indicator of stress responses. Electroanesthesia is a fast, economic, eco-friendly and safe anesthetic method provides desirable trout immobility for aquaculture activities. *(Asian Journal of Animal and Veterinary Advances 4 (6): 306-313, 2009;* ***doi:*** *10.3923/ajava.2009.306.313)*

## Automation of Flock Management and Establishment of Decision Support Systems for Small Ruminant Production

H. Önder, M. Akif Çam and E. Soydan

This study is carried out to automate the small ruminant (sheep and goat) records and to use these records more effectively for animal breeding. It was aimed to calculate breeding values for animals by using this software. Additionally, it was aimed to calculate breeding values in terms of milk yield for male animals by using progeny testing (average offspring yield) which otherwise could not be measured by direct methods. Decision support systems, which help to decision making for flock owners and animal breeding persons, have been enhanced by using this software. Decision support systems such as determining of animals to be sold

because of old age, determining of offspring that they have unknown father, accurately determining of yields of animals, health managements, determining of culling animals from flock were put into service of user as a tool. Appropriate software SURPRO V1.0 was written by use of Visual basic 6.0 and MsAccess was used as database with this objective in mind. *(Asian Journal of Animal and Veterinary Advances 4 (6): 314-319, 2009;* ***doi:*** *10.3923/ajava.2009.314.319)*

## Anti-Inflammatory Activities of Diethyl-Ether Extracts of *Helichrysum plicatum* DC. and *Tanacetum balsamita* L. in Rats

M. Karaca, H. Özbek, H.A. Akkan, M. Tütüncü, F. Özgökce, A. Him and B. Bakir

The aim of this study was to investigate anti-inflammatory activity of the diethyl ether extract of *Tanacetum balsamita* L. subsp. (TB) and *Helichrysum plicatum* DC. subsp. (HP) in carrageenan-induced inflammation in rats. Lambda carrageenan (0.05 mL) was injected into the subplantar region of the right hind paw to induce inflammation. Control group and the reference group were administered isotonic saline solution and indomethacin, respectively. TB extract was injected in doses of 25, 50 and 100 mg $kg^{-1}$ in the groups TB-25, TB-50 and TB-100, respectively. HP-25 HP-50 and HP-100 groups were injected HP extract in doses of 25, 50 and 100 mg $kg^{-1}$. Before the injections and 3 h after the injections the volume of right hind-paw of rats was measured using a plethysmometer. TB and HP had anti-inflammatory effects matching to that of the reference agent at all doses. It was found that reduction in the inflammation was 95.21% with indomethacin, 51.93% with TB-25, 52.55% with TB-50, 61.51% with TB-100, 70.73% with HP-25, 73.15% with HP-50 and 82.90% with HP-100. Median effective dose ($ED_{50}$) value of TB and HP were found to be 81.484 and 73.030 mg $kg^{-1}$, respectively. The results showed that *Tanacetum balsamita* L. subsp. and *Helichrysum plicatum* DC. subsp. had a significant anti-inflammatory activity. *(Asian Journal of Animal and Veterinary Advances 4 (6): 320-325, 2009;* ***doi:*** *10.3923/ajava.2009.320.325)*

## Effects of 5 h Wetting of Sun-Dried Cassava Tuber Meal on the Hydrocyanide Content and Dietary Value of the Meal for Laying Hens

G.E. Enyenihi, A.B.I. Udedibie, M.J. Akpan, O.L. Obasi and I.P. Solomon

The efficacy of wetting sun-dried cassava tuber meal as a method of reducing its hydrocyanide (HCN) content and improving its nutritive value for laying hens was investigated. Cassava tubers were peeled, chopped into pieces, sun-dried and then

milled. Part of the Sun-dried Cassava Tuber Meal (SCTM) was soaked in water at the rate of 5 parts of water to 4 parts of the meal, thinly spread on the floor for 5 h and then taken out and sun-dried again. The Raw Cassava Tuber Meal (RCTM), Sun-dried Cassava Tuber Meal (SCTM) and Wetted Sun-dried Cassava Tuber Meal (WSCTM) were analyzed for HCN content. Five diets were made such that diet 1 (control) contained no cassava tuber meal; in diets 2 and 3, 50% of the maize in diet 1 was replaced with SCTM and WSCTM, respectively, while in diets 4 and 5, 100% of the maize was replaced with SCTM and WSCTM, respectively. Each diet was fed to a group of 24 laying hens for 12 weeks. At the end of the feeding trial, 4 birds were randomly selected from each group and used for determination of internal organ weights and haematological indices. Raw cassava tuber meal contained 800 ppm HCN, SCTM contained 50 ppm HCN while WSCTM contained 10 ppm HCN. The group on 100% WSCTM diet consumed significantly ($p<0.05$) less feed, gained least body weight and recorded least hen-day egg production, possibly due to very powdery nature of the diet. Egg weight and feed conversion ratio were not affected by the treatments ($p>0.05$). Egg quality indices were also not affected by the treatments ($p>0.05$). Internal organ weights were not affected by the treatments ($p>0.05$) but the birds on cassava diets recorded significantly ($p<0.05$) more abdominal fat. The birds on cassava diets also recorded significantly ($p<0.05$) less WBC and PCV values relative to the control group. *(Asian Journal of Animal and Veterinary Advances 4 (6): 326-331, 2009; **doi:** 10.3923/ajava.2009.326.331)*

## The Seroprevalence of Ovine Toxoplasmosis in Fars Province, Southern Iran

Q. Asgari, D. Mehrabani, M. Moazzeni, F. Akrami-Mohajeri, M. Kalantari, M.H. Motazedian and G.R. Hatam

This study determines the prevalence of ovine toxoplasmosis in Shiraz, Southern Iran. From April 2004 to May 2005, serum samples of 603 sheep were randomly collected in 18 Cities of Fars Province, Southern Iran and tested for toxoplasmosis using Indirect Fluorescent Antibody Technique (IFAT). The prevalence of toxoplasmosis was 26.5%, while the rate of seropositivities in 1/100, 1/200, 1/400 and 1/800 dilutions were 17.7, 2.8, 4.3 and 1.7%, respectively. The highest prevalence was in Abadeh (56.7%) and Nourabad (44.3%) cities and the lowest was determined Arsanjan (4.2%) whereas no infection was determined in Fasa. Considering the high prevalence of toxoplasmosis in sheep in our region, control measures need to be undertaken to prevent transmission of the infection to other animals and man by health and veterinary authorities. Therefore, it seems that standardization of techniques, hygienic standards in sheep breeding especially in cities with more migrating domestic animals and environmental health

education for veterinary personnel are required to prevent human infection. *(Asian Journal of Animal and Veterinary Advances 4 (6): 332-336, 2009;* ***doi:*** *10.3923/ajava.2009.332.336)*

## The Effects of Replacing Soybean Meal with Different Levels of Rapeseed Meal on Egg Quality Characteristics of Commercial Laying Hens

1S.R. Riyazi, Y. Ebrahimnezhad, K. Nazeradl, N. Maheri-Sis, R. Salamatdust and T. Vahdatpour

One hundred and forty four of Hy-line (W-36) laying hens from the age of 44 to 56 weeks were used to evaluate the effects of replacing different levels of rapeseed meal with soybean meal on egg quality characteristics of commercial laying hens. The rapeseed meal was replaced with soybean meal at the levels of 0 (control), 5, 10 and 15% for 12 weeks. Hens were distributed in multi-observational completely randomized block design with 4 treatments, three replicates and 12 hens in each replicate. The parameters used to assess were haugh unit, shell thickness, shell weight, shell strength and yolk index. Results showed that addition of 10% rapeseed meal in diets increased ($p<0.05$) eggshell weight. With increasing of rapeseed meal level in diets, yolk index had showed decline ($p<0.05$). No specific trend was observed on the effect of rapeseed meal on haugh unit, shell thickness and shell strength, however these parameters were higher in groups that fed 10% rapeseed meal. We did not observe any health problems of the hens during the experiment. *(Asian Journal of Animal and Veterinary Advances 4 (6): 337-341, 2009;* ***doi:*** *10.3923/ajava.2009.337.341)*

## Incidence Rate of Varroaris in Honey Bee Colonies of Eastern Azarbaijan Province, Northwestern Iran

R. Jamshidi, M. Yousefkhani and A.R. Lotfi

The aim of this study is to come to a conclusion on the seasonal existence of varroaris in the apiaries of Eastern Azerbaijan Province, Northwestern Iran and comparing the spread rate of varroaris in this region with other regions (reported in similar studies). Among 942 apiaries under study (located in 10 regions in the province) in one year, 217 apiaries were infected by varroaris. Varroaris was witnessed to be found in its lowest rate in June (7.72%) and its peak was recorded to be in March (44%). Parasitic infection in the apiaries in the area in the months of honey production, during summer and fall demonstrated an increasing procedure in a way that in the months: July, August, September and October, the

percentage of infected apiaries was, respectively 9.76, 26.82, 32.92 and 40%. In January, February and March the peak of infection witnessed was, respectively: 33.33, 34.66 and 44%. It is proposed that the rate of varroaris infection is higher in cold regions such as Eastern Azarbaijan Province comparing to warm climates and its incidence and spread in the cold seasons (fall and winter) is more than warm and hot seasons (spring and summer). *(Asian Journal of Animal and Veterinary Advances 4 (6): 342-345, 2009;* ***doi:*** *10.3923/ajava.2009.342.345)*

## *Neospora caninum* and *Toxoplasma gondii* in Lion (*Panthera leo*) from Senegal, West Africa

A.R. Kamga-Waladjo, O.B. Gbati, P. Kone, R.A. Lapo, E. Dombou, G. Chatagnon, S.N. Bakou, P.E.H. Diop, L.J. Pangui, D. Tainturier and J.A. Akakpo

The prevalence of antibodies to *Neospora caninum* and *Toxoplasma gondii* were investigated in seven lions (*Panthera leo*) from Hann's zoo of Dakar-Senegal. Seven sera samples were examined for antibodies against *Neospora caninum* (*Neospora caninum* antibodies test kit, cELISA) and *Toxoplasma gondii* (ID Screen® Toxoplasmosis Indirect ELISA). All sera were positives to *Neospora caninum* antibodies whereas 3 for 7 (42.86%) were positives to *Toxoplasma gondii*. Serological results indicate a common exposure to *Neospora caninum* and *Toxoplasma gondii* among lions (*Panthera leo*) from zoo in Senegal. *(Asian Journal of Animal and Veterinary Advances 4 (6): 346-349, 2009;* ***doi:*** *10.3923/ajava.2009.346.349)*

## Reproductive Biology and Histological Studies in Abu Mullet, *Liza abu* in the Water of the Khozestan Province

M. Chelemal, S. Jamili and I. Sharifpour

To study the reproductive biology of *Liza abu*, 360 samples of this species were collected during the period from February 2007 to January 2008. Reproductive characteristics of *Liza abu* showed that sex ratio is 1: 2.7 male to female, respectively. This means that females predominate males. Monthly variation in GSI of both sexes were quiet apparent. Maximum values were recorded in March (10.26 and 11.51% for males and females, respectively) and reached to the minimum levels in August (0.42 and 1.15% for males and females, respectively). These cyclic changes in GSI indices are considered as a proof that maturation season is started from January and spawning occurs in April. The maturity stages

of male and female *Liza abu* are separated to 6 different successive stages. These stages in female are immature, resting, developing, developed, spawning (ripe) and post spawning. The testes maturation classified to virgin (immature), maturing virgin, maturing virgin, developing, developed, ripe and spent. The ova diameter ranged from 16.02 to 470.3 μ. It can be classified into transparent eggs ranging from 16.02 to 106.97 μ in diameter and yolked egg ranging from 126.82 to 470.3 μ in diameter. *(Journal of Fisheries and Aquatic Science 4 (1): 1-11, 2009; **doi:** 10.3923/jfas.2009.1.11)*

## Distribution of Fish Assemblages in Two Floodplain Lakes of North 24-Parganas in West Bengal, India

D.K. Mondal and A. Kaviraj

Assemblage of fish and their seasonal variation in two floodplain lakes in the Bongaon subdivision of the north 24-parganas district of West Bengal in India was investigated during the period 2004 to 2006. These lakes are locally called as baur. Forty nine species belonging to 23 families were recorded from these two baurs. Cyprinidae was the most dominant family with eleven species. Overall species composition of the two baurs almost resembled each other. But average number of species in a month significantly varied between the baurs. Species richness and the total number of individuals caught per each sampling varied significantly between seasons. *Amblypharyngodon mola* (Cyprinidae) and *Gudusia chapra* (Clupeidae) were the most abundant among the eighteen frequently available species from these two baurs. But more than fifty percent of the species were sparsely available. *(Journal of Fisheries and Aquatic Science 4 (1): 12-21, 2009; **doi:** 10.3923/jfas.2009.12.21)*

## Increasing in Growth of *Rutilus frisii kutum* Larvae with Using Slurry (Fermented Organic Manure)in Yosefpoor Propagation and Rearing Center (Iran)

M. Fallahi Kapoorchali, S.M. Reza Fatemi, G. Vosoghy, M. Matinfar and M. Sharifian

The main objective of this study is to investigate the effect of slurry on larval growth in comparison with common methods; thus, cow manure was fermented under anaerobic conditions for 40 days. Then the following two treatments were examined: concentrated food as common method and slurry as the new method. To study, the two treatments and each with three replications, 6 ponds were selected, each measuring 1.7 ha with depth of 1.7 m. The larvae population density

was 1.7 m $ha^{-1}$. The results showed that the mean weight and length, in slurry treatments were 77.16±25.3664 mg and 22.03±2.31 mm and in control treatment were 63.13±17.8552 mg and 19.6±2.296 mm, respectively. Condition factor was found to be 0.9 for slurry and 0.8 for control treatment. During culture period some other factors such as DWG (Daily Weight Gain), DLG (Daily Length Gain), CF (Condition Factor) and SGR (Specific Growth factor Rate) were measured. In comparison with control group, all parameters had higher values in slurry treatment. The statistical analysis indicated that there is a significant difference ($p<0.001$) for parameters of length and weight for both treatments in the first week of culture and also there was a significant difference ($p<0.05$) for the items in the 2nd week too. The obtained results showed that the slurry, due to high concentration of nutrients, had more effect on growth and increased the abundance of zooplanktons, which are the main food of larvae in early stages of life cycle. *(Journal of Fisheries and Aquatic Science 4 (1): 22-31, 2009;* ***doi:*** *10.3923/jfas.2009.22.31)*

## Patterns of Reproduction and Spawning of the *Scomberomorus commerson* in the Coastal Waters of Iran

M.S. Sadeghi, F. Kaymaram, S. Jamili, M.R. Fatemi and M.S. Mortazavi

Patterns of reproduction and spawning were studied for the king fish (*Scomberomorus commerson*) in the Persian Gulf (Hormozgan province). During one year of sampling, 599 fish were collected from different landing sites along the Persian Gulf. Analysis of the reproductive stages and gonadosomatic index revealed a single yearly reproductive cycle beginning in March and ending with a single spawning period in August-September. The mean length at first maturity (Lm 50%) for females was 75 cm. The sex ratio was M/F = 0.97 in the samples. *(Journal of Fisheries and Aquatic Science 4 (1): 32-40, 2009;* ***doi:*** *10.3923/jfas.2009.32.40)*

## The Influence of Photoperiod in Farming Beluga Sturgeon (*Huso huso*): Evaluation by Growth and Health Parameters in Serum

F. Askarian and A. Kousha

Data on the concentrations of some blood constituents of reared Beluga sturgeon, *Huso huso*, including Serum cortisol, glucose, triglyceride, cholesterol, osmolality, $Na^+$, $K^+$, $Ca^{2+}$, ALP that reared under different light regimes were measured. The light regimes were consist of natural photoperiod (NP), continuous dark (0L:24D),

continuous light (24L:0D) and long day regime (16L:8D) and tested on 4 group of 30 one year old reared Beluga for 6 month which sampled four times during the experiment. No significant difference in serum cortisol and ALP levels was found between treatments ($p>0.05$). Elevations of serum cortisol, glucose, cholestrol and triglyceride concentrations were reported in continues dark regime. Increase of serum osmolality, $Na^+$, $K^+$ and decrease of $Ca^{2+}$ were also associated with increase of cortisol levels. Results are compared with the few data available in condroestean fish and with those on teleosts. *(Journal of Fisheries and Aquatic Science 4 (1): 41-49, 2009; **doi:** 10.3923/jfas.2009.41.49)*

## Preservative Effect of Quanats Water to Reduce Lead Acetate Toxicity ($LC_{50}$, 96 h) on *Capoeta fusca*

Arash Omidi, Sohrab Mazloomi and Homayoon Farhangfar

This study was conducted to determine the acute toxicity of lead acetate on *Capoeta fusca*. A total of 580 fishes with mean length of 12.28±0.14 cm and mean weight of 16.64±0.52 g. were divided into 15 control and treatment groups of fish. The fish were kept in 20 L aquariums and the procedure designed in static condition according to the Organization Economic Cooperation and Development (OECD) method. Mortality rate was recorded in 96 h and lead acetate $LC_{50}$ was calculated by standard statistical method. $LC_{50}$ of 10.992, 10.594, 9.338 and 7.575 mg $L^{-1}$ were determined at 24, 48, 72 and 96 h post exposing respectively. In addition, minimum and maximum lethal concentrations of lead were determined as 4 and 12.5 mg $L^{-1}$ and MAC was 0.7575 mg $L^{-1}$. Lead acetate in soft water (Hardness 10 mg $L^{-1}$) was highly toxic for fish but in hard water (Hardness: 310 mg $L^{-1}$) had a little toxicity. High trend of lead for interaction with minerals such as calcium and carbonates is the major reason of this phenomenon. Lead toxicity is decreased with increase of water hardness and this is the cause of fish tolerance against some heavy metals pollution in natural environment. Lead intoxicated fish showed abnormal behaviors, restless and rapid circling. *(Journal of Fisheries and Aquatic Science 4 (1): 50-56, 2009; **doi:** 10.3923/jfas.2009.50.56)*

## Feeding and Spawning of *Sphyraena jello* in the North-West of Persian Gulf

S.A. Hosseini, S. Jamili, T. Valinassab, G. Vosoghi and S.M.R. Fatemi

This study, being conducted in 2006-2007, attempts to investigate its biological habit and characteristics in Iran's water of the Persian Gulf. For the sampling purpose, three major landings namely Bushehr, Deylam and Genaveh were

selected to obtain samples from commercial catches. The sampling is composed of 655 males and 515 females during a twelve month period. By studying the feeding through the counting method, it is revealed that, *Liza subviridis* characterized by 42.8% and *Sepia pharaonis* by 8.4% made the highest and lowest stomach content, respectively. The findings showed that male fish in smaller size will mature sooner than females specimen but this sex ratio or proportion was not significantly different except during October and September. Such a difference between male and female in different months could be originated from longer residing of female group in spawning ground compared to male group. The earlier spawning lasted during September-October and there was a peak of spawning in feeding in August. The lowest fat proportion for both male and female genders was reported 0.10 and 0.11, respectively in October; but the highest level of condition factor was reported to be 0.59 and 0.63 during November and June. *(Journal of Fisheries and Aquatic Science 4 (1): 57-62, 2009;* ***doi:*** *10.3923/jfas.2009.57.62)*

## Detection of Genetic Variation in the Wild Populations of Indian Major Carps Using Random Amplified Polymorphic DNA Fingerprinting

Sameer R. Phale, Shivkumar Chauhan, Yogesh V. Bhute and Vidya V. Baile

Genetic variations in wild populations of Indian Major Carps (IMCs) from six geographically isolated locations of Central India Rivers were examined using Randomly Amplified Polymorphic DNA (RAPD). Thirty six specimens of each species from each location were collected. Genomic DNA was isolated from the liver tissues. Out of twenty RAPD primers used, thirteen were found to be scorable on agarose gel, of which 83.33% were polymorphic for *Labeo rohita*, 80.0% for *Cirrhinus mrigala* and 75.0% for *Catla catla*. A total of 576 RAPD bands were amplified. Dendrogram generated for species-specific genetic evaluation revealed that *C. catla* was genetically dissimilar from *L. rohita* and *C. mrigala*. The present investigation is the first report on wild varieties of IMCs while the available data on farmed varieties suggest that *C. catla* and *C. mrigala* are more genetically similar to each other than to *L. rohita*. This study also revealed high intra-specific genetic variation in the wild populations of IMCs. To conclude, the present study suggest high levels of genetic variation and population differentiation required for dynamic evolution and RAPD assay therefore may have potential use for establishing genetic relationship, genome specificity and phylogeny among wild species of IMCs. *(Journal of Fisheries and Aquatic Science 4 (1): 63-70, 2009;* ***doi:*** *10.3923/jfas.2009.63.70)*

## Influence of 17-Alpha Methyl Testosterone on Masculinization and Growth in Tilapia (*Oreochromis mossambicus*)

M. Marjani, S. Jamili, P.G. Mostafavi, M. Ramin and A. Mashinchian

In the present study, effect of different dose rates of synthetic androgen 17-alpha Methyl Testosterone (MT) i.e., 50, 75 and 100 mg of hormone in per kg of feed, on sex reversal and growth performance of Mozambique tilapia was evaluated. MT was administrated orally by using pellet dry starter and Ethanol Alcohol, diet to tilapia fry for 21 days in glass aquaria. The fry were also kept for 2 weeks after feeding to monitor its growth performance. At the end of the experiment the sex ratio was determined by examining the gonads after dissecting the fish. Growth performance was monitored by recording the morphometric characteristics. Wet body weight and total length of fish on start of feeding end of feeding and two weeks after feeding were measured. The results of the present study showed that all MT receiving treatment showed a significantly higher male proportion than the control experiment. Dose rate of 75 mg $kg^{-1}$ MT of feed resulted in maximum male population (98.09%) with 1.91% sterilized fish. The dose rate of 75 mg $kg^{-1}$ MT gave the maximum gain in body weight i.e., 11.8 g, which is 1.2 times greater than the control. *(Journal of Fisheries and Aquatic Science 4 (1): 71-74, 2009;* ***doi:*** *10.3923/jfas.2009.71.74)*

## Trophic Seasonal Behavior of the Icthyofauna of Camaronera Lagoon, Veracruz

Carbajal-Fajardo Zuleica Shareet, Franco-López Jonathan, Héctor Barrera Escorcia, Luis Gerardo Abarca Arenas, Carlos Bedia Sánchez, Ángel Moran Silva and Horacio Vázquez-López

The objective of this study was to analyze the seasonal behavior of the icthyofauna, considering the trophic relationships between the species that live in Camaronera Lagoon, their food composition, diversity and trophic amplitude, as of the captures obtained in Camaronera Lagoon inlet during February-June, 2000. We realized seasonal tables of the fish species and items of identified foods. The data were grouped in diurnal and nocturnal samplings in order to know the abundance, specific richness, evenness and McNaughton's community dominance index. The amplitude of the niche was calculated as of Levin's standardized index. Costello's graphic method was used to evaluate the preference and feeding behavior of any given type. The families with more species were *Cichlidae*, *Eleotridae* and *Gobiidae*. The most representative species regarding biomass and abundance

were *Gambusia affinis*, *Petenia splendida*, *Cathorops melanopus*, *Diapterus auratus* and *Bathygobius soporator*. *(Journal of Fisheries and Aquatic Science 4 (2): 75-89, 2009;* ***doi:*** *10.3923/jfas.2009.75.89)*

## Using Reefcheck Monitoring Database to Develop the Coral Reef Index of Biological Integrity

Hai Yen T Nguyen, Ole Pedersen, Kou Ikejima, Kengo Sunada and Satoru Oishi

The coral reef indices of biological integrity was constituted based on the reef check monitoring data. Seventy six minimally disturbed sites and 72 maximally disturbed sites in shallow water and 39 minimally disturbed sites and 37 maximally disturbed sites in deep water were classified based on the high-end and low-end percentages and ratios of hard coral, dead coral and fleshy algae. A total of 52 candidate metrics was identified and compiled. Eight and four metrics were finally selected to constitute the shallow and deep water coral reef indices respectively. The rating curve was applied for each metric to identify two lower $a_i$ and upper $b_i$ threshold values. A set of scores 1, 3 and 5 was used to score and narrate individual metric values. Each metric value at a site presented a poor, moderated or good condition of reefs. The index was calculated by averaging all selected metric scores. The overall site classification efficiencies were of 65.97 and 66.13% for shallow and deep waters, respectively. Importantly, the strong negative correlation between indices and dynamite fishing -0.286 ($p<0.01$) and number of yacht within 1 km -0.185 ($p<0.05$) in shallow water and with poison fishing -0.279 ($p<0.05$) and coral damaged by other factors -0.283 ($p<0.05$) in deep water indicated that coral reef indices were sensitive responses to stressors and can be capable to use as the coral reef biological monitoring tool. *(Journal of Fisheries and Aquatic Science 4 (2): 90-102, 2009;* ***doi:*** *10.3923/jfas.2009.90.102)*

## Evaluation of Antifungal Activity of New Combined Essential Oils in Comparison with Malachite Green on Hatching Rate in Rainbow Trout (*Oncorhynchus mykiss*) Eggs

S.M. Mousavi, S.S. Mirzargar, H. Ebrahim Zadeh Mousavi, R. Omid Baigi, A. Khosravi, A. Bahonar and M.R. Ahmadi

The aim of this study was introducing a new herbal constitution for malachite green in hatcheries. In this study, antifungal activities of a new Combination of Essential Oils (CEO) from the herbs; *Thymus vulgaris*, *Salvia officinalis*, *Eucalyptus*

*globulus* and *Mentha piperita* in *Oncorhynchus mykiss* eggs and its effects on hatching rate in comparison with malachite green (a specific treatment for the control of saprolegniasis) were studied. After fertilization, eggs were transferred to incubators and then treated with five concentration of the combined essential oils with concentrations: 10, 50, 100, 150 and 200 ppm, respectively and malachite green (1 ppm) using constant flow treatment method for incubation period. One incubator was as control without any treatment The water quality factors were controlled over the study period. In the end of hatching rate, the mold infection and hatching rate were calculated. The hatching percentage in five treatment groups of CEO were 69.99% at 10 ppm, 63.61% at 50 ppm, 62.1% at 100 ppm, 60.53% at 150 ppm, 54.63% at 200 ppm, 60%. 83 at 1 ppm of malachite green group and 53.48% in control group, respectively. The results revealed significant antifungal effects of the combined essential oils in comparison with malachite green on fish eggs so that it could decrease mold infection and increase hatching rate on concentration 10 ppm ($p<0.05$). This indicated that this combination of essential oils may be a promising antifungal agent in aquaculture. *(Journal of Fisheries and Aquatic Science 4 (2): 103-110, 2009; **doi:** 10.3923/jfas.2009.103.110)*

## Length-Weight Relationship of *Sphyraena obtusata* Cuvier, 1829 (Pisces: Perciformes) from the Jaffna Lagoon, Sri Lanka

K. Sivashanthini, G. Gayathri and K. Gajapathy

The present study was carried out to gain some knowledge on length-weight relationship parameters, growth pattern and difference between the growth parameters of male and female *Sphyraena obtusata*. The knowledge of length-weight relationship has numerous practical applications in fishery biology. Such a mathematical equation enables conversion of one parameter in to another as is often required during monitoring field measurements. Length-weight regression equations were derived for male and female *Sphyraena obtusata* collected from the Jaffna lagoon, Sri Lanka. Regression coefficients were estimated by using the logarithms of the total lengths and the corresponding weights. The curvilinear relationships of length-weight relationships for male and female were $W = 0.0117*L^{2.898}$ and $W = 0.0138*L^{2.843}$, respectively. Covariance analysis for length-weight relationships of males and females revealed that there is no significant difference ($p>0.05$) between male and female and hence a common formulae of $W = 0.0133*TL^{2.857}$ was derived for *S. obtusata*. The 'b' values 2.898 and 2.843 obtained for male and female, respectively indicate that the fish follows the cube law and its growth is negative allometry. *(Journal of Fisheries and Aquatic Science 4 (2): 111-116, 2009; **doi:** 10.3923/jfas.2009.111.116)*

## Effect of Rearing Systems (Mono- and Poly-Culture) on the Performance of Freshwater Prawn (*M. rosenbergii*) Juveniles

M.S. El-Sherif and A.M. Ali Mervat

This study was carried out to investigate the effect of mono and polyculture of freshwater prawn with Nile tilapia fry on growth performance and survival rate. Freshwater prawn-juveniles, (*M. rosenbergii*) averaging (0.30±0.02 g) in weight [Trial 1 (monoculture)] were cultured for 90 days, with different stocking densities (50, 100, 150 and 200 prawn $m^{-2}$) using 12 circular fiberglass tanks (0.36 $m^2$ and 0.6 m in water depth). Prawns were fed manufactured diet contained 35% protein. Water exchange occurred daily with 20% of water size. Growth measurements of prawn were recorded at 15 days intervals. The results showed that growth performance was significantly ($p \leq 0.05$) decreased with increasing the stocking density. Survival rate was inversely related to stocking density, since there were significant differences among the four densities, while the difference between stocking density of 50 and 100 prawn $m^{-2}$ was not significant. The food conversion ratio FCR increased with increasing the stocking densities, since the fourth density (200 prawn $m^{-2}$) was significantly higher than that achieved in the first one (50 prawn $m^{-2}$). Prawn juveniles, of average weight 0.30±0.02 g [Trial 2 (Poly culture)]were stocked (as declared in Trial 1) in poly culture with Nile tilapia fry (average weight 0.3±0.03 g) at stocking density 12 fish per $m^2$ for each treatment, for 90 days. Growth measurements of prawns and fish were recorded at 15 days intervals. Results showed that growth performance for fish and prawn were significantly ($p \leq 0.05$) decreased with increasing of the stocking density of prawn. Survival rate was inversely related to stocking densities, since, there were significant differences among the four treatments. Also, the food conversion ratio FCR for fish and prawn increased with increasing stocking density, since, the differences were significant among the four stocking densities. Therefore, polyculture system is more suitable at stocking density of 100% prawn $m^{-2}$ for optimum growth and survival rate than of monoculture. *(Journal of Fisheries and Aquatic Science 4 (3): 117-128, 2009;* ***doi:*** *10.3923/jfas.2009.117.128)*

## Causes and Mitigations on Trap Ghost Fishing in Oman: Scientific Approach to Local Fishers' Perception

Hussein S. Al-Masroori, H. Al-Oufi and Paul McShane

This study aims to investigate the ghost fishing problem in Sultanate of Oman. The questionnaire survey on trap ghost fishing in Oman provided information on rates

of trap loss, the financial cost to fishers, the cause of trap loss and the circumstances leading to non recovery of fish traps. Each trap fisher in the Omani fishery owned and fished on average 20.4 traps per fishing day and each trap had a mean useful lifetime of 5.7 months. The study revealed that a total of 15,390 traps or 18 traps per fisher are lost every year in the study area. Once lost, these traps remain functional and on average continue to ghost fish for a period of 3.1 months per year. The three main causes of trap loss were gear interference, theft and/or vandalism, and collisions with boats and ships. Economic losses resulting from ghost fishing by traps was estimated to be 1,011,594 O.R. (US$ 2.63 million), equivalent to 2.1% of the total landing value of the Omani fishery in 2006. To reduce ghost fishing it is recommended that traps be better marked, that they be equipped with timed-release or degradable sections or panels, and that openings be included in the traps for the release of sub legal size fish. Conflicts with other fishing vessels and other types of gear could be reduced by implementing a zonation policy. *(Journal of Fisheries and Aquatic Science 4 (3): 129-135, 2009;* ***doi:*** *10.3923/jfas.2009.129.135)*

## The Fluctuation of Coralline Fish Larvae of Khark and Kharko (Persian Gulf)

G.H. Vosoghi, M.R. Fatemi, S. Jamili, A.R. Nikoyan and M. Rabbaniha

This study was undertaken due to identification, abundance and diversity, temporal and spatial fluctuation of coralline fish larvae in Khark and Kharko Islands water. Khark and Kharko Islands are the last Northern point for fringing coral reefs in Iranian side of the Persian Gulf. These Coralline habitats are the Protected Area and Wildlife Refugees with the total area of 2400 ha which located in the territory of Bushehr Province. This research carried out during 2006-2007 with monthly sampling from 9 stations, which selected around Islands inshore waters with maximum depth of 20 m. Sampling was conducted using by Bongo-Net plankton sampler with 500 μ of mesh size. Totally 494 specimens from: 22 coralline fish larva families were identified in studied area, such as pelagic and demersal fishes. The results was shown that coral reef diversity in coral reefs (Khark and Kharko Islands) is more than other habitats such as estuary and river mouth, creeks, mangrove forest sites and off shore water of the Persian Gulf and Oman Sea Iranian side. The pick of fish larvae abundance family were estimated in spring. *(Journal of Fisheries and Aquatic Science 4 (3): 136-142, 2009;* ***doi:*** *10.3923/jfas.2009.136.142)*

## Reproductive Biology of the Japanese Threadfin Bream, *Nemipterus japonicus*, in the Northern of Persian Gulf

M. Kerdgari, T. Valinassab, S. Jamili, M.R. Fatemi and F. Kaymaram

Since the *N. japonicus* comprises the most abundant commercial fish in the Persian Gulf, an evaluation of the stock status of this species is needed. Reproductive biology of *Nemipterus japonicus* in the northern part of Persian Gulf is described, based on 595 specimens collected between November 2006 and October 2007. Length range of females was 11.0-26.3 cm FL and their weight range was 21.7-325.65 g. Males ranged from 9.4-27.3 cm FL and 14.04-351.89 g in weight. The relationship between Body Weight (BW) and Fork Length (FL) for all individuals was estimated as $BW = 0.0181 \times FL^{3.0001}$ ($r^2 = 0.9797$, n = 503). The overall sex ratio was estimated as M: F = 1.0: 2.6. The length at 50% maturity was estimated to be 19.1 cm for females and 19.6 cm for males. The smallest size at first maturity was 9.4 cm for males and 11.0 cm for females. The spawning behavior was investigated based on macroscopic observations of gonads and determination of gonadosomatic index. The maximum GSI values were recorded in April (2.70%) and September (0.45%) for females and males, respectively. Spawning occurs in spring and autumn seasons. *(Journal of Fisheries and Aquatic Science 4 (3): 143-149, 2009; **doi:** 10.3923/jfas.2009.143.149)*

## Effects of Pollutants on Some Aquatic Organisms in Temsah Lake in Egypt

M.S. El-Sherif, M.T. Ahmed, M.A. El-Danasoury and Nagwa H.K. El-Nwishy

Temsah lake is considered one of the wild life features in Egypt in general and in the Suez Canal region in particular. Through field experiment, concentrations of some pesticides which are used around the area, were monitored in the tissues of some birds of prey (wild birds), some species of algae, fish and crustaceans. The results obtained revealed: (1) The presence of some Organochlorines (OC) in the tissues of many of the tested birds represented in (DDE, Heptachlore, HCH, Dicofole). (2) The presence of high residues of Organophosphorus (OP) pesticides represented in malathion and diazinon in most of the tested birds. But they were not detected with high levels in any of fish, crustaceans or algae. (3) The presence of high concentrations of (OC) compounds in the tissues of algae, crab, mullet and some birds (moorhen-cormorant and gulls). Meanwhile, none of those compounds was detected in the water samples. (4) The presence of high levels of all detected pesticides in the tissues of crab makes it the very acceptable

bioindicator to mirror the pollution of the lake, then followed by algae. (5) Pollutants can be transferred through the food chain which causes biomagnification of them in the bodies of the higher organisms in the food chain. It could be concluded that implementation of the environmental management practices in Lake Temsah is still needed to protect these ecosystems from more pollutions which could affect human health and environment. *(Journal of Fisheries and Aquatic Science, 4 (3): 150-160, 2009;* ***doi:*** *10.3923/jfas.2009.150.160)*

## Population Genetic Structure of Pikeperch (*Sander lucioperca* Linnaeus, 1758) in the Southwest Caspian Sea Using Microsatellite Markers

M. Gharibkhani, M. Pourkazemi, M. Soltani, S. Rezvani and L. Azizzadeh

The aims of this study were to analysis the population genetic structure and genetic diversity among and between populations of *Sander lucioperca* based on microsatellite markers. For this purpose, 149 samples of adult pikeperch from three regions of Southwest Caspian Sea (Talesh Coasts, Anzali Wetland and Chaboksar Coasts) were collected. DNA was extracted and using 13 pairs of microsatellite primers, Polymerase Chain Reaction (PCR) was conducted. DNA bands were analysed using Biocapt and GenAlex software package. Out of 13 microsatellite primers, 11 loci were produced, in which 6 of them were polymorphic and 5 monomorphic. Analysis revealed that the average number of alleles per locus and observed heterozygosities were not statistically significant ($p>0.05$) for all 3 populations. The $F_{ST}$ value between populations was low but significant ($p<0.01$), suggesting that the 3 populations are genetically differentiated. Deviation from Hardy-Weinberg equilibrium was obvious in most cases, mostly due to the deficiency of heterozygosities. The highest genetic distance was between Anzali Wetland and Chaboksar Coast populations. The data generated in this study provide useful information on the genetic variation and differentiation in populations of Southwest Caspian Sea pikeperch. *(Journal of Fisheries and Aquatic Science, 4 (3) 161- 168, 2009;* ***doi:*** *10.3923/jfas.2009.161.168)*

## Evaluation of Diazinon Toxicity on Nile Tilapia Fish (*O. niloticus*)

M.S. El-Sherif, M.T. Ahmed, M.A. El-Danasoury and Nagwa H.K. El-Nwishy

Diazinon was used in the laboratorial study to investigate its biochemical effect on tilapia as it is the most popular fish in Egypt. Two hundred and twenty appeared

40±2 g adult male Nile tilapia were reared in glass aquaria of 60 L capacity, provided with a good air supply and dechlorinated tap water, Fish were maintained under suitable condition for the fish growth. Results of the study are summarized as follow: (1) The bioassay test revealed that the $LC_{50}$ for tilapia after 96 h of exposure was 2.8 ppm, (2) Fish was very excited after being exposed to lethal concentrations of diazinon (5, 10, 200 ppm) for 96 h. Meanwhile, fish exposed to sublethal concentrations of diazinon for 30 days didn't cause mortality to fish and (3) Exposing fish to 0.28 and 1.87 ppm for 30 days caused the following changes: (A) A reduction in total protein content in muscles up to 13.69 and 21.5% for 0.28 and 1.87 ppm, respectively, (B) A reduction in total protein content in blood serum up to 22.23 and 24.32% for 0.28 and 1.87 ppm, respectively and (c) 52, 27 and 6.8 kDa proteins were not scanned in the treated or the recovered samples in both treatments, a slight reduction in the 33.55, 31.72, 24.31 and 20.8 kDa proteins in both treatments, (4) Exposing the treated fish to 7 days of recovery in un poisoned water caused the following changes: (A) A recovery in total protein content in muscles up to 95.59 and 90.58% for 0.28 and 1.87 ppm, respectively, (B) A recovery in total protein content in blood serum up to 89.36 and 95.14% for 0.28 and 1.87 ppm, respectively and (C) 52.27 and 6.8 kDa proteins were still not scanned after recovery of both treatments. A slight increase in the rest of affected proteins after recovery of both treatments was recorded. Therefore, it can be emphasized for good environmental administration of the water bodies to save human health and environment from the dangerous pesticides. *(Journal of Fisheries and Aquatic Science 4 (4): 169-177, 2009;* ***doi:*** *10.3923/jfas.2009.169.177)*

## Protective Effect of Antioxidant Medicinal Herbs, Rosemary and Parsley, on Subacute Aflatoxicosis in *Oreochromis niloticus*

Manal Ibrahim El-Barbary and Ahmed Ismail Mehrim

The object of this study was to conduct the ability of two medicinal herbs, namely rosemary and parsley, for amelioration of aflatoxicosis in *Oreochromis niloticus*. Two herbs' extracts at three concentrations of either (0, 2 and 4 g $kg^{-1}$ b.wt. divided into 2 doses at the start and the $6^{th}$ day of the experiment) and three concentrations of aflatoxin $B_1$, ($AFB_1$ 0, 9 and 18 mg $kg^{-1}$ b.wt. as a single intraperitoneal administration) were tested either individually or in combination. The herbs and $AFB_1$ were dissolved in Dimethylsulphoxide (DMSO 25%) and injected to fish groups. Sixteen groups of fish were investigated in this study, where A group (control) was injected with saline 0.89%, group B injected with DMSO

(control solvent), groups $F_1$ and $F_2$ were injected with $AFB_1$ alone (9 and 18 mg $kg^{-1}$ b. wt., respectively), $R_1$ and $R_2$ groups were injected with rosemary alone (2 and 4 g $kg^{-1}$ b. wt., respectively), groups $F_1R_1$, $F_1R_2$, $F_2R_1$ and $F_2R_2$ were injected with $AFB_1$ + rosemary, while groups $P_1$ and $P_2$ were injected with parsley alone (2 and 4 g $kg^{-1}$ b. wt., respectively); however, $F_1P_1$, $F_1P_2$, $F_2P_1$ and $F_2P_2$ groups were injected with $AFB_1$ + parsley. At the 12$^{th}$ day of the experiment, blood and liver samples were taken from each group. The results indicated that the $AFB_1$ injected groups revealed a significant increase in mortality rate (MR%) compared with $AFB_1$-not injected, group $F_2$ was the highest while $F_1R_1$ and $F_1P_1$ were the lowest in MR% among all $AFB_1$ injected fish groups. Also, $AFB_1$ led to reduction of haemoglobin (Hb), total protein (TP) and globulin (GL) concentrations and increase in activity of aspartate aminotransferase (AST) and alanine aminotransferase (ALT). These alterations were significantly ameliorated when fish were injected with herbs' extracts. $AFB_1$ residues showed that the herbs level of 2 g $kg^{-1}$ b.wt. have higher potency of reducing the $AFB_1$ residues than the level of 4 g $kg^{-1}$ b.wt. in case of $AFB_1$ level 9 mg $kg^{-1}$ b.wt. While, in case of $AFB_1$ level 18 mg $kg^{-1}$ b.wt., the groups $F_2$ and $F_2P_1$ showed absence of $AFB_1$ residues. Microscopically, $AFB_1$ presented histopathological changes in hepatopancrease which increased in severity with increasing $AFB_1$ level. These lesions may become less severer in all fish groups injected with $AFB_1$ combined with herbs' extracts especially with the lowest levels of herbs' extracts and $AFB_1$. So, this study concluded that either of rosemary or parsley was found to be safe and successful in protection from aflatoxicosis, particularly at the low level. *(Journal of Fisheries and Aquatic Science 4 (4): 178-190, 2009; **doi:** 10.3923/jfas.2009.178.190)*

## Accumulation of Lipofuscin and Preliminary Estimation of Age-Structure in Wild Mud Crab (*Scylla paramamosain*) Population in Tropical Mangrove Swamps, Thailand

Md. Sherazul Islam and Hisashi Kurokura

The age structure of wild mud crab (*Scylla paramamosain*) was explored using autofluorescent age pigment, lipofuscin. Samples were collected from the mangrove swamp area in Pak Phanang mangrove swamps, Thailand. The carapace width-frequency distribution did not show any distinct modes of the sample population, whereas lipofuscin concentration showed positive correlation with carapace width. Lipofuscin concentration in the Olfactory Lobe Cell Mass (OLCM) of the brain was measured using image analysis of fluorescent

micrographs. The lipofuscin concentration (% of area fraction) ranged from 0.06 to 0.26 with the formation of three regularly-spaced modes developed by modal analysis that could be regarded as distinct age classes. Strong correlation was found between lipofuscin concentration and modes observed in the lipofuscin concentration histogram ($R^2 = 0.99$) and the lipofuscin accumulation rate was almost constant (0.08% of area fraction) in each year. Although, existence of wide size ranged population in a lipofuscin concentration mode, the analysis suggested that *S. paramamosain* live in the mangrove ecosystem at best of $2^+$ year class. *(Journal of Fisheries and Aquatic Science 4 (4): 191-202, 2009;* ***doi:*** *10.3923/jfas.2009.191.202)*

## Effects of Different Protein and Energy Levels on Growth Performance of Caspian Brown Trout, *Salmo trutta caspius* (Kessler, 1877)

Hamid Ramezani

The objective of this study is to assess the effects of protein and energy levels of diet on fish performance and growth efficiency of Caspian brown trout in order to develop optimum protein and energy level during the preparation of diet for this species. Fish were fed with six experimental diets containing three protein levels (45, 50 and 55%) and two energy levels (3.5 and 4 kcal $g^{-1}$) according to a 3×2 factorial design. The diet was assigned to 18 tanks with 50 fish each, with three replicates for each diet. The experiment was conducted for 8 weeks with Caspian brown trout with an initial body weight of around 7 g. Protein content of diet influenced feed conversion ratio ($p<0.05$) and specific growth rate statistically ($p = 0.052$). Caspian brown trout demonstrated a better feed conversion ratio and a larger specific growth rate at lower protein levels (45 and 50%) in comparison to high protein level (55%). Protein efficiency ratio improved by a decrease in protein content of the diet ($p<0.05$), but energy content of diets does not affect any growth related parameter such as feed conversion ratio, specific growth rate and protein efficiency ratio. There was also no interaction between protein and energy levels in the growth related parameters, suggesting the effect of protein on the growth parameters in Caspian brown trout did not depend on energy levels of diet. In conclusion diet containing 50% protein can support the maximum growth and protein sparing by the use of high-energy diet did not occurred in this study. *(Journal of Fisheries and Aquatic Science, 4 (4): 203-209, 2009;* ***doi:*** *10.3923/jfas.2009.203.209)*

## First Remarks on Abalone Biology (*Haliotis pustulata*) on the Northern Coast of Aden Gulf, Yemen

A.M. Ali, A.A. Basmidi, M.Sh. Aideed and Al-Quffail A. Saeed

Abalone has been exploited by humans around the ocean coasts of the world. On contrary, it is still neglected in the Gulf of Aden. This study is a first attempt to explore the biological and ecological status of the absolutely unexploited abalone *Haliotis pustulata* in the Aden Gulf, Yemen. Between Jan 2004 and June 2006, about 700 abalones were collected and analyzed from Intertidal and sublittoral zones along 6 sites of Hadhramout coast. It is revealed that the studied species is relatively small, measuring up to 62 mm, with a slow growth rate of 4-10 mm $year^{-1}$ and has moderate fertility compared with many other species in other localities. The highest GSI as well as the highest proportion of mature Sufaylah were prevailed from March to May. Morphological traits, spread, age-size structure and reproduction behavior are discussed in the light of the absence of local similitude studies and well documented world wide haliotids. Results call for necessity of more detailed studies. *(Journal of Fisheries and Aquatic Science 4 (5): 210-227, 2009;* ***doi:*** *10.3923/jfas.2009.210.227)*

## Calcium Pre-Exposure Reducing Histopathological Alteration in Nile Tilapia (*Oreochromis niloticus*) After Lead Exposure

P. Singhadach, W. Jiraungkoorskul, T. Tansatit, P. Kosai and C. Ariyasrijit

This study was evaluated the influence of calcium to reduce the toxicity of sub-lethal lead concentration in Nile tilapia with emphasis on histopathological analysis. The values of 24, 48, 72 and 96 h $LC_{50}$ of lead to tilapia were 247.51, 197.47, 183.74 and 182.38 mg $L^{-1}$, respectively. Fish were pre-exposed to vary dosages of calcium carbonate: 0 (G1 and G2); 20 (G3 and G4) and 60 (G5 and G6) mg $L^{-1}$ for 4 days. After that, fish were post-exposed to 45 mg $L^{-1}$ lead, which correspond to 25% of the 96 h $LC_{50}$ (G2, G4 and G6) for 96 h. Histopathological changes were especially most evident in the group (G2) exposed to lead without calcium pre-exposure. The gills were observed edema, lamellar cell hyperplasia, epithelial lifting, lamellar fusion and aneurysm. There were blood congestion in sinusoids, vacuolation of hepatocytes and necrosis. Glomerulus's atrophy, tubular swelling and also necrosis were seen. However, the only observable lesion in the muscle was the infiltration of inflammatory cells and there were no histopathological changes observed in the brain and intestine of the lead treated fish. Fish with pre-exposed calcium (G4 and G6) showed slightly alteration

when compare the only lead treatment groups. The results suggested that calcium pre-exposure may play an important role in the reduction of lead toxicity in fish. *(Journal of Fisheries and Aquatic Science 4 (5): 228-237, 2009;* ***doi:*** *10.3923/jfas.2009.228.237)*

## Response to Increased Sediment Load by Three Coral Species from the Gulf of Suez (Red Sea)

M.L. Ebeid, M.H. Hassan and Y.A. Geneid

This study examines the hypothesis that sedimentation, as a result of anthropogenic activities, has a measurable effect on the growth rate (in terms of linear extension) of branching corals of a subtropical site in the northern Gulf of Suez. Three of the dominant branching coral species; *Stylophora pistillata* (Esper) 1792, *Acropora pharaonis* (Milne Edwards and Haime) 1860 and *A. hemprichi* (Ehrenberg) 1834 were chosen for monitoring their growth rate after the cessation of construction works. At the beginning of the study, the three study species had very low rates of growth in response to increased sediment load. Over time sedimentation rates decreased significantly while linear extension rate per branch of the three study species showed a significant gradual increase. The study reaches the conclusion that coral growth is negatively related to sedimentation. *(Journal of Fisheries and Aquatic Science 4 (5): 238-245, 2009;* ***doi:*** *10.3923/jfas.2009.238.245)*

## Hematological Parameters and Erythrocyte Osmotic Fragility in Rainbow Trout, *Oncorhynchus mykiss*, Experimentally Infected with *Pseudomonas putida*

S. Bektas and O. Ayik

In the present study, selected hematological and osmotic fragility values in rainbow trout, following experimental *Pseudomonas putida* infection have been described. Blood samples were collected at day, 1, 3, 7, 14 and 21 post inoculation and examined for the above parameters. Erythrocyte values were significantly decreased at all days. Hematocrit values at day 14 was significantly higher than other days. Hemoglobin values revealed significant decrease from day first onwards. Among red blood cell indices, MCV were found significantly higher from day 1 to 21. Significant decrease in MCHC were also reported. MCH remain unchanged in all days examined. Leukocyte values at day 21 were significantly higher than at day 7. In addition, thrombocytes values at day 21 were significantly

higher than at day 7 and 14 . On the other hand, erythrocyte osmotic fragility values were significantly increased at day 14 and 21 post infection. Interpreted hematological data in the present study, can be used to assess an abnormality or disease process in pseudomonas infected rainbow trout. *(Journal of Fisheries and Aquatic Science 4 (5): 246-253, 2009;* ***doi:*** *10.3923/jfas.2009.246.253)*

## Effects of Pre-Drying on Quality of Fried Breaded Black Pomfret (*Parastromateus niger*) Fillet

Y. Moradi, J. Baker, Y. Che Man and S. Kharidah

The objective of this study was to investigate the effects of pre-drying process on quality of fried breaded fish fillets. For this study, breaded black pomfret (*Parastromateus niger*) fillets were pre-dried in conventional oven at 180°C for 0, 30, 60, 90 and 120 sec. The pre-dried fillets were pre-fried in sunflower oil and stored at -20°C for 1 week. They were then finally cooked in the combination oven. Fat, moisture, texture and color of the cooked fillets were evaluated. Results indicated that moisture loss and the fat uptake of cooked fillets decreased with increasing pre-drying time. Instrumental texture analysis showed that hardness of the pre-dried samples increased as compared to the control. Results from color evaluation showed that the b* (yellowness) values of the samples increased, while L* (whiteness) and a* (redness) values did not change significantly ($p<0.05$). The best quality product was prepared when 90 sec pre-drying time was applied. *(Journal of Fisheries and Aquatic Science 4 (5): 254-260, 2009;* ***doi:*** *10.3923/jfas.2009.254.260)*

## Effect of Dietary Supplementation of Biogen® (Commercial Probiotic) on Mono-Sex Nile tilapia *Oreochromis niloticus* under Different Stocking Densities

A.I. Mehrim

The present study was carried out to evaluate the effects of dietary supplementation of a commercial probiotic Biogen® on growth performance, carcass composition, blood hematological and biochemical parameters, histometric characteristics of fish dorsal muscles and economic efficiency of mono-sex Nile tilapia *Oreochromis niloticus* under different stocking densities. Therefore, fish with similar body weight (12.71±0.17 g) were distributed randomly into seven treatments at different stocking densities, being 10 fish $m^{-3}$ which fed a basal diet without Biogen® ($T_1$), 10 fish $m^{-3}$ ($T_2$), 20 fish $m^{-3}$ ($T_3$), 30 fish $m^{-3}$ ($T_4$), 40 fish

$m^{-3}$ ($T_5$), 50 fish $m^{-3}$ ($T_6$) and 60 fish $m^{-3}$ ($T_7$), which were fed the basal diet but supplemented with 3 g Biogen® $kg^{-1}$ diet for 14 weeks. The obtained results indicated that $T_4$ was the best treatment which realized significantly ($p \leq 0.05$) increases of all growth performance parameters (final weight, AWG, ADG and SGR), hematological parameters (hemoglobin, RBCs count, PCV, blood platelets and WBCs count), plasma proteins (total protein, albumin, globulin and albumin/globulin ratio), improved FCR, blood indices (MCV, MCH and MCHC), differentiation of leukocytes, carcass composition, histometric characteristics of fish dorsal muscles and best economic efficiency. There were no adverse effects on water quality criteria among all experimental treatments. Consequently, from the obtained results, it could be concluded that the inclusion of the commercial probiotic Biogen® at a level of 3 g $kg^{-1}$ diet at stocking density rate of 30 fish $m^{-3}$ of mono-sex Nile tilapia *O. niloticus* is useful to get the best fish performance with friendly effects on the environment. *(Journal of Fisheries and Aquatic Science 4 (6): 261-273, 2009;* ***doi:*** *10.3923/jfas.2009.261.273)*

## The Use of Stable Isotopes and Stomach Contents to Identify Dietary Components of the Spotted Rose Snapper, *Lutjanus guttatus* (Steindachner, 1869), off the Eastern Coast of the Southern Gulf of California

Arturo Tripp-Valdez and Francisco Arreguín-Sánchez

The food habits of the spotted rose snapper, *Lutjanus guttatus* (Steindachner, 1869), living off of the Eastern coast of the Southern Gulf of California (off the coast of Nayarit) are described based on their stomach contents and isotopic analysis. Fish were collected from the bycatch of shrimp trawling during the 2005-2007 shrimp fishing seasons. Twenty-six taxa were identified in the stomach contents and the geometric importance index suggested xanthid crabs and engraulidae fish are the most important species in the *L. guttatus* diet. Isotopic analysis and mixing models also led to the identification of crustaceans as important species in diets, but fish were considered only as secondary prey in these models. Notably, the diet and trophic level of the spotted rose snapper tend to change as it matures; young fish mainly feed on crustaceans, while larger *L. guttatus* can incorporate fish into their diets. Furthermore, Morisita-Horn index suggests that there are significant differences between the diets of juvenile and adult fish. The estimates of the trophic level for *L. guttatus* from stomach contents ($TL_{sc}$ = 3.7) and isotopic analysis ($TL_{iso}$ = 3.5) are very similar. *(Journal of Fisheries and Aquatic Science 4 (6): 274-284, 2009;* ***doi:*** *10.3923/jfas.2009.274.284)*

## Median Lethal Concentration ($LC_{50}$) for Suspended Sediments in Two Sturgeon Species, *Acipenser persicus* and *Acipenser stellatus* Fingerlings

M.Y. Garakouei, Z. Pajand, M. Tatina and H. Khara

Median lethal concentration ($LC_{50}$) of suspended sediments in the Sepidrud River on two sturgeon species *Acipenser persicus* and *Acipenser stellatus* were determined to provide reliable criteria and guidelines for the protection of aquatic resources. Static bioassays were performed for 24 and 96 h periods on *A. persicus* and *A. stellatus* one control was used for *A. persicus*. Three replicates were used for each trial. Ten fish were stocked in each aquarium ($35\times30\times35$ $cm^2$) containing 30 L of water. pH, dissolved oxygen concentration and water temperature was measured and recorded throughout the experimental period. The $LC_{50}$ for 24 and 96 h for median lethal concentration were determined following Probit analysis. The $LC_{50}$ for 24 and 96 h for suspended sediments was 46294 and 8539 mg $L^{-1}$ in *A. stellatus* fingerlings, respectively. However, *A. persicus* fingerlings showed higher tolerance and median lethal concentration for suspended sediments but this species $LC_{50}$ was 15367 mg $L^{-1}$ for 96 h and 60802 mg $L^{-1}$ for 24 h. *(Journal of Fisheries and Aquatic Science 4 (6): 285-295, 2009;* ***doi:*** *10.3923/jfas.2009.285.295)*

## Stability of Effective *Edwardsiella tarda* Vaccine Developed for Japanese Eel (*Anguilla japonica*)

Md. Mer Mosharraf Hossain and Kenji Kawai

This study aimed to design to evaluate the immunogenicity as well as the stability of inactivated bacterins in storage conditions to prevent edwardsiellosis in fish species. Three vaccine formulations, formalin (0.4%, FKC), pressure (600 kgf $cm^{-2}$ for 5 min, PKC) and electric current (100 mA at 12v DC for 5 sec, ECKC) killed bacterin and a routes of administration with intraperitoneal injection (i.p.) was tested. The effectiveness of the immunization strategies was evaluated in terms of Relative Percent Survival (RPS) and antibody levels. On the basis of the results pressure inactivated vaccine via i.p. which confers RPS values over 85% at least 6 months post-vaccination. In the search for a more stable bacterin, inactivated *E. tarda* antigen was subjected to different storage temperatures. Storage at 4°C did not significantly affect the titer of PKC and antigenic potency remained stable

for 6 month. However, with the bacterins FKC and ECKC there is a considerable loss of potency during stored at 4°C. Bacterins were discarded if exposed to temperature of 0°C or below, because the precise freezing point is not established. Bacterins loosed significant potency after 1 month when stored at 25°C. *(Journal of Fisheries and Aquatic Science 4 (6): 296-305, 2009; **doi:** 10.3923/jfas.2009.296.305)*

## The Relation Between Egg Viability, Selected Aspects of Egg and Ovarian Fluid Composition and Time of Stripping in Endangered Caspian Brown Trout (*Salmo trutta caspius*)

M. Bahrekazemi, A. Matinfar, M. Soltani, B. Abtahi, I. Pusti and A. Mohagheghi

The effects of egg retention time in the abdominal cavity after ovulation on egg viability were studied in Caspian brown trout (*Salmo trutta caspius*). Eggs were retained in the parental abdominal cavity for 40 days post ovulation. Partial volumes of eggs stripped from 10 individually identified females and fertilized with fresh semen obtained from 8 males at 10 days intervals for 4 stages. The biochemistry of the eggs and ovarian fluid were studied to investigate possible links with post-ovulatory oocyte aging. The eyeing and hatching rate of the eggs declined with over-ripening time: that is, the expected amounts (90.60±6.28% for eyeing and 86.33±6.82% for hatching) in newly ovulated eggs (0-10 days post ovulation) decreased to 0.67±1.34% and 0.49±0.98%, respectively, in over-ripened eggs (30-40 days post ovulation). However, larval abnormalities remained constant for 30 days after ovulation. Over the course of post-ovulation oocyte aging, the pH of the ovarian fluid significantly decreased and the concentration of glucose, protein, calcium, iron and aspartate aminotransferase activity significantly increased. Moreover, the concentration of protein, triglycerides and aspartate aminotransferase activity in the eggs also changed. The present study demonstrated that the best time to take Caspian brown trout eggs after ovulation at 7±0.6°C was up to 10 days post ovulation. Also, egg viability was related to both ovarian fluid parameters (e.g., pH, protein, aspartate aminotransferase, glucose, cholesterol, triglycerides, iron, calcium) and egg parameters (e.g., cholesterol, triglycerides, iron, aspartate aminotransferase) which can be used to detect egg quality defects associated with oocyte post-ovulatory aging. *(Journal of Fisheries and Aquatic Science 4 (6): 306-315, 2009; **doi:** 10.3923/jfas.2009.306.315)*

## Population Genetic Study of *Rutilus frisii kutum* (Kamansky 1901) from the Caspian Sea; Iran and Azerbaijan Regions, using Microsatellite Markers

L.S. Kavan, S.R. Gilkolaei, G. Vossoughi, S.M.R. Fatemi, R. Safari and S. Jamili

The genetic diversity and population structure of *Rutilus frisii kutum* from three regions in the Iranian coastline and one region from Azerbaijan were investigated using microsatellite DNA markers. Genomic DNA from 140 specimens was extracted and using PCR approach nine loci with reasonable polymorphism were amplified. The results showed that the lowest mean number of alleles per locus (5.22) was observed in Tonekabon River and the highest (5.77) in Azerbaijan population. The observed heterozygosity in the Tonekabon River (0.625) population was higher than those of the other two populations in Iran and Azerbaijan population (0.473). Significant deviations from HWE were found at more loci in the Iranian populations than Azeri population. In spite of geographical distance, both the highest and lowest population differentiation ($F_{st}$) value was between Iranian populations not among the Iranian and Azerbaijan populations. The highest and significant was between Khoshkrud and Tonekabon (0.098) and the lowest and significant was between Khoshkrud and Gorganrud (0.062). The genetic distance was the lowest (0.27) between the Khoshkrud and Gorganrud populations, whereas the highest distance (0.493) was between Khoshkrud and Tonekabon River.The AMOVA analysis with consideration of 2 sampling regions (Iran and Azerbaijan) and 4 sampling locations (Iran: Khoshkrud, Tonekabon, Gorganrud and Azerbaijan: the Kura mouth) revealed that almost all of the variance in data namely 86% ($p = 0.01$) was within locations, genetic variances among locations was 12% ($p = 0.01$) and among regions was 2% ($p = 0.01$). The reported results could be of interest for management and conservation programmes of this species in the Caspian Sea. *(Journal of Fisheries and Aquatic Science 4 (6): 316-322, 2009; **doi**: 10.3923/jfas.2009.316.322)*

## Effect of Pb and Cd on the Iron Solute in Blood (*Chalcalburnus chalcoides*)

S. Daei, S. Jamili, A. Mashinchian and M. Ramin

This study was carried out within inland Aquaculture Research Center Bandar Anzali (Guilan Province) through Southwestern part of the Caspian Sea; to examine the effect of two heavy metals (lead, cadmium) on (Fe) amount in blood of *Chalcalburnus chalcoides*. This fish is widespread and lives through Southern

and Western part of the Caspian. The sampling was randomly done in two stages. The size of fish was 15-16 cm. After transferring fish to the pool, in order to adaptation, has been provided 12 aquariums in which 9 fish were released to each one. Regarding to the lowest capacity (LC50) for these fish, chose the selective densities to pollute aquariums' environs. In such a way that for each aquarium cell with a constant density, we account 0.05, 0.15 and 0.03 ppm for lead and 0.15, 0.25 and 0.75 ppm for cadmium, respectively; while a stereotype aquarium was considered as a non- polluted environ. In each stage, we left 3 fish out of them to take blood from their heart and tail-stem, then we transferred the frozen samples to the lab. This experiment was repeated for the second metal as the same. Acid nitric digested the blood to provide a transparent and colorless solution for the atomic absorption device. With respect to the obtained absorptions by Pb, Cd and Fe in lab, the variance analysis (ANOVA) was carried out in (SPSS) and (Excel) systems. Based on statistical results, cadmium with ratio $p<0.05$ replaced with ferritin (Fe) over the time, but metal (Pb) couldn't so. The results indicated that by increase in lead density within various times, this metal was absorbed by other fish's tissues. *(Journal of Fisheries and Aquatic Science 4 (6): 323-329, 2009;* ***doi:*** *10.3923/jfas.2009.323.329)*

## Isolation and Characterization of Saprolegniaceae from Rainbow Trout (*Oncorhynchus mykiss*) Eggs in Iran

H.A.E. Mousavi, M. Soltani, A. Khosravi, S.M. Mood and M. Hosseinifard

The goal of the this study was to identify Saprolegniaceae fungi isolated from affected rainbow trout eggs in six hatcheries in Mazandaran Province (Northern Iran) from December 2006 to February 2007. The isolated oomycetes were classified according to their morphological characteristics on hemp seed media at 18-24°C. Seven fungal species belonging to three genera of *Saprolegnia, Achlya* and *Brevilegnia* were identified. The fungal species were morphologically characterized as *S. parasitica*, *S. mixta*, *S. monilifera*, *Saprolegnia* sp., *A. oblongata*, *Achlya* sp. and *Brevilegnia* sp. This is the first recorded oomycetes infection in rainbow trout hatcheries in Iran. *(Journal of Fisheries and Aquatic Science 4 (6): 330-333, 2009;* ***doi:*** *10.3923/jfas.2009.330.333)*