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News

Abstracts of Research Articles Published in Chinese Journals

News

China to Produce 48.9 Million Tonnes of Aquatics This Year

China's fishery industry would maintain a stable growth this year with aquatic production growing three percent year-on-year, the Ministry of Agriculture predicted Tuesday. Approximately 48.9 million tonnes of aquatics would be produced nationwide this year, 3 percent more than last year, according to the ministry. Despite the global financial woes, the nation's trade surplus in aquatic products increased 190 million U.S. dollars, or 5.78 percent year-on-year, to 3.49 billion U.S. dollars in the first three quarters, the ministry said. Besides the financial turmoil, the aquatic breeding sector was challenged by frequent natural disasters, including the severe winter weather at the beginning of this year and typhoons in midyear. But the sector achieved the output growth through upgrading breeding ponds, building disease control and quarantine system for aquatic creatures and establishing a fine breed system.

Source: www.gov.cn, December 9, 2008

Insight into the aqua feed business in China

The half-day industry session held on 23 September 2008 was part of the 7th Symposium of World's Chinese Scientists on Nutrition and Feeding of Finfish and Shellfish (SWCSNFFS). The theme of this session was 'Aquafeed Enterprises Technology Innovation'. It was hosted by Dr. Kang-Sen Mai. Industry representatives came from the New Hope Group, Haid, Evergreen Group, Tongwei Co., Ltd. and other leading aqua feed producers in China.

In China, similar to elsewhere, feed is the key factor followed by good seedstock and water quality in determining growth performance of fish and shrimp. It accounts for at least 70% of production cost. However, we have faced increasing challenges during recent years, particular in aqua feeds production, according to Dr. Mai.

Meeting demand

Aqaufeed production in China in 2007 was 13.26 million tones showing a growth of 17.7 times as compared to volumes in 1991 (750, 000 tonnes). Currently, the total aquafeed demand for all farmed fish production is 32.3 million tones, but the production data in China shows a supply of only 13.3 million tones. This implies there is a market gap of 19 million tones in Chine. The current aquafeed production is only 41% of total demand.

Not only raw materials prices

The problems in China are not only soaring prices of raw materials but also lack of know-how, serious feed safety issues and the lack of proper business model. As for cost, the feed company can hardly convert the raw materials cost to feed with a margin. Therefore, the overall profitability in aqua feed production in the past three years has decreased significantly and apparently will reach a historical low in 2008. Research should also focus on availability of raw materials such as nutrients availability, amino acid balance, palatability, unknown growth factors

and interaction between nutrients. The common problems of the aqua feed business model in China are bad debts and long term credit, said Dr. Mai in his presentation.

Innovation development is becoming increasingly important. The lack of demand from customers should provide a clue that they are unsure of their direction. Innovative companies could propose directions and solutions which go beyond the expectation of the clients. General market investigation is not enough and we should engage with the customer and brainstorm to find out their needs. In addition, we should help optimize their business and good use of their assets, Said Gan Zhi-lim, Kemin China.

Source: January/February 2009 AQUA Culture AsiaPacific Magazine

Shangdong Province Exported Less Aquatic Products

East China's Shandong Province saw a 3.6 percent year-on-year decline in aquatic product export in 2008-- the first drop since 2004, the latest customs statistics have shown. The province exported 776,000 tons of aquatic products last year, according to the Qingdao Customs. About 89 percent of the exports went to the European Union (EU), Japan, the Republic of Korea (ROK) and the United States, with the figures broken into 276,000 tons, 170,000 tons, 136,000 tons and 108,000 tons, respectively. Despite a slight rise of 6.7 percent and 1.5 percent in the exports to the EU and Japan, the exports to the ROK and the U.S. dropped 24.4 percent and 8 percent from the year-earlier level.

Ma Yongsheng, the head of the statistics department of the Qingdao Customs in Shandong Province, said that during the past year, the processing and export of China's aquatic products has received "an unprecedented shock." "The aquatic enterprises have been reeling from the financial crisis, frequent food safety accidents and rising production cost," he said. On Nov. 1, 2008, China raised the export rebate rate for aquatic products such as frozen fish fillets from 9 percent to 13 percent, and on Dec. 1, the country again raised the export rebate rate of frozen prawn and crab from 5% to 13%. However, Shandong's export of aquatic products in November and December declined 24.3 percent and 24.4 percent from the corresponding months of the previous year, respectively.

"The government's measures have eased the cost pressure of the enterprises to some extent," said Ma, "but the recovery of the industry need a longer time." The customs official suggested aquatic products enterprises to improve technologies for quality inspection, raise products' added value, and improve product quality to cope with a more complex external environment in 2009.

Source: www.gov.cn, February 3, 2009

Preliminary study on biological characteristics of spadenose shark, Scoliodon laticaudus,caught from coastal waters of Zhejiang province

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Based on the specimens of spadenose shark, Scoliodon laticaudus,caught from coastal waters of Zhejiang Province during Feb. from Mar.2005,Oct.from Dec.2006,Jan.and Apr.fromMay.2007,biological characteristics were analyzed. The relationship between total length(TL)and body weight(W)can be modeled as W = 5×10-5 TL2.62,and relationship between total length and fork length(FL),total length and precaudal length(PCL)may also be fitted by simple linear models.No obvious differences were found between feeding intensity of females and males,and the feeding intensity of majority of specimens was relatively low.The hepatosomatic indices(HSI)increased as the individuals grew,while the fins weight indices(FWI)did not. The size at sexual maturity was 465-765 mm(TL)for females,with the average of 573 mm(TL),and 476-761 mm(TL)for males,with the average of 579 mm(TL).The mean length of the left and right claspers for mature males is 54.6 mm(TL).

【Keyword】：Scoliodon laticaudus; Zhejiang; coastal waters; biological characteristics; maturity
Source: Journal of Shanghai Fisheries University, Issue 5, 2008

Character of the nutritional composition of Chinese white dolphin *(Sousa chinensis)*

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Nnutritional compositions were determined in muscle of two Chinese white dolphins(Sousa chinensis) found in outer Sea of Zhujiang river.The results showed that lipids were much higher in belly than in other parts.Content of total amino acid of immature female dolphin was higher than that of mature male.Glu was highest and Cys was lowest among 18 amino acids.Typical fatty acids found in the animal, palmitic(16∶0),palmoleic acid(16∶1),stearic(18∶0),oleic(18∶1),EPA(20∶5n3)and DHA(22∶6n3)dominates in both species.SAF had the same content as MUFA obtained, both were higher than total PUFA. Muscles were rich with metal such as Ca Fe, Zn Cu, Mn ,Se. Content of Cu、Mn was higher in the body of immature female dolphin,while Se was lower than mature male dolphin.

【Keyword】：Chinese white dolphin;nutritional composition;amino acid;fatty acid;metal
Source: Journal of Shanghai Fisheries University, Issue 5, 2008

Comparison on the karyotypes of *Scapharca subcrenata,Tegillarca granosa* and *Estellarca olivacea*

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The karyotypes of diploid Scapharca subcrenata,Tegillarca granosa and Estellarca olivacea were studied in trochophores by means of hot-dropping method and could be described by 20m+12sm+6st with NF=70,22m+12sm+4st with NF=72 and 18m+18sm+2st with NF=74,respectively.The diploid chromosome numbers were all 2n=38.The sex chromosomes and the satellites were not found. It was considered that Tegillarca granosa was more advanced than the other two species by the method of comparision on dissymmetry. The clustering analysis was made by group mean method, the result showed that the evolutionary degree of Estellarca olivacea lay between Scapharca subcrenata and Tegillarca granosa and the specific relationship of Estellarca olivacea and Scapharca subcrenata was more closer.

【Keyword】：Scapharca subcrenata; Tegillarca granosa; Estellarca olivacea; karyotype
Source: Journal of Shanghai Fisheries University, Issue 5, 2008

Research on genetic diversity of Macrobrachium nipponense in Taihu Lake

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RAPD(Random Amplified Polymorphic)analysis was applied to detect the genetic diversity of four populations of Macrobrachium nipponense sampled from Huzhou, Suzhou, Wuxi, Yixing around the Taihu Lake. Under the pre-optimized conditions,16 effective primers were selected from 50 random primers.117 clearly and stable loci, with 92 polymorphic loci,ranging from 200bp to 2000bp in length, were detected. The percentages of polymorphic loci of four populations were 49.57 %,60.68%,53.85%,57.26 %.Their mean expected heterozygosity ranged from 0.207 7 to 0.216 3,and their Shannon information index ranged from 0.296 7 to 0.305 3.Index of genetic diversity Gst ranged from 0.164 4 to 0.200 2.Analysis of molecular variation(AMOVA)revealed that 16.67% of the variances were from inter-population, Pst analysis indicated that the variance of inter-population significantly affected the total variance. The genetic distance indicated that genetic divergence existed between four populations. The maximum genetic distance occurred between Suzhou and Yixing populations(0.148 1),and the minimum between Wuxi and Yixing populations(0.114 1).Results of cluster analysis based on UPGMA indicated that the closest relationship was found between Wuxi and Yixing populations, then was Huzhou and Suzhou populations.

【Keyword】：Macrobrachium nipponense; Taihu Lake; Genetic diversity; RAPD
Source: Journal of Shanghai Fisheries University, Issue 5, 2008

Determination of ethyl carbamate in grape wine by solid phase extraction and gas chromatography

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Sample was extracted by solid-phase extraction(SPE)and then analyzed by gas chromatography(GC).The optimal separation conditions were as follows:flow rate was 1.0 mL/min, column temperature as temperature program:50 ℃(1 min)→10 ℃/min→150 ℃→3 ℃/min→220 ℃(5 min),sample size was 2.0 μL;The time of determination was 38 min. The efficiencies on extraction of five

extraction column were compared and the cleanert silica column was chosen.Internal standard method was used as the quantitative determination. The RSDs were 1.6%、1.2% and the recovery rates were 90.4%-101.5% respectively. With this method,8 wine samples were determined, the contents of ethyl carbamate were 11.6-30.1 μg/L.

【Keyword】：Solid-phase extraction; Gas chromatography; Grape wine; Ethyl carbamate
Source: Journal of Shanghai Fisheries University, Issue 5, 2008

Analyses on countermeasures to protect interests of aquaculture farmers in Shanghai

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The social and economic development brings about the substitution of industries It is vital for the substitution and the stability of society to protect the interests of practitioners of out-of-date industry. Due to rapid economic development, aquaculture in Shanghai will be substituted by other industries, which will be more outstanding than in other provinces of China. In terms of Fisheries Law of the People's Republic of China, aquaculture farmers in China can be classified into two kinds. One kind of farmers is those who use waters and tidal land owned by the whole people, and another is those who use waters and tidal land owned by collective. The paper mainly focused on interests protection of those who use waters and tidal land owned by the whole people. Thanks to unique geography, Shanghai has great advantages to develop its aquaculture industry. But recently, the scale of aquaculture industry has been declining for aquaculture waters and tidal land being substituted for other utilities. During the process, former aquaculture farmers have not got reasonable arrangement, which aroused great concerns. Referring to Property Right Law, Fisheries Law and other regulations, the paper proposed interests of aquaculture farmers be protected by private law and public law. For that purpose, waters and tidal lands should be planned, the rights and interests of related parties be specified and the contents and standards for compensation be provided. At same time, same relationships should be handled properly, such as protecting farmers' interests and safeguarding aquaculture industry, direct and indirect protection measures, etc.

【Keyword】：interests protection; aquaculture farmer; property right law; Shanghai
Source: Journal of Shanghai Fisheries University, Issue 5, 2008

Statolith morphology of the purpleback flying squid *Sthenoeuthis oualaniensis* in the northwest Indian Ocean

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The morphology and microstructure of statolith of the purple back flying squid Sthenoeuthis oualaniensis were studied for the 114 samples with 142-575 mm mantle length(ML),which were collected during jigging surveys in the northwest Indian Ocean from

October to December 2004 and in April 2005.The study indicated that its statolith has the structure with great rostrum and small dorsal dome, and its morphological structure is obviously different compared with other family squids like Gonatus fabricii. Six most important featured parameters including total statolith length(TSL),maximum width(MW),lateral dome length(LDL),ventral dorsal dome length(DLL),rostrum lateral dome length(RLL)and wing length(WL)were best described by power functions with ML($P<0.05$).With the squid growing, the size of statolith gradually develops, while the ratio of each featured parameter to ML slowly decrease, and the ratio of FDL,LDL,FRL and WL to TSL almost remain the same level, corresponding to 42%,57%,49% and 75%.

【Keyword】：purple back flying squid; morphology characteristic of statolith; principal component analysis; the northwest Indian Ocean

Source: Journal of Shanghai Fisheries University, Issue 5, 2008

Analysis of crab diversity in the Oujiang river estuary during summer and autunm

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Based on the data from investigation of two oceanographic censuses in the Oujiang estuary during June and September of the year 2007,this paper studied the crab composition, spatial-temporal distribution and richness and diversity(H')involved in some impact factors such as background of topography and geomorphy, as well as water masses. Results showed that 16 species was identified among which Argyrosomus argentatus was main dominant species in June, and Portunus trituberculatus in September. In 0-10m coastal waters, lower species number in each station and abundant species in whole areas are incompatible. This is because the whole waters was broken into different niches by many islands. On the contrary, broad and flat topography in the outer of the investigation areas made water environmental variation reduced so that similar species composition and abundant species were occurred simultaneously. A single absolutely dominant species made lower crab H' value in the south or east-south areas. Seasonal and regional Oujiang dilute water and cross of different water masses were critical in the affection on the crab richness and diversity of this waters.

【Keyword】：Oujiang estuary; crab; species composition; diversity.

Source: Journal of Shanghai Fisheries University, Issue 5, 2008

Identification, fermental optimization and exploratory development of an actinomycete strain against diverse aquatic zymad

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A marine actinomycete strain having antibacterial activity to aquatic pathogens was initially identified as Streptomyces fradiae by cytoderm chemi-component and 16S rDNA sequence analysis. The optimal fermentation conditions were as follows glucose

1.5%,beef extract 2%,sea salt 1.5%,K2HPO4 0.05%,CaCO3 0.1%,MgSO4·7H2O 0.05%,temperature 33 ℃,primary pH 6.0,inoculum 10%,strain age 48h by orthogonal design. It was ascertained the valence of primary broth was as same as Kanamycin sulfate which was 550.81 μg/mL by bioactivity detection. Its MIC and MBC to Aeromonas hydrophila was respectively 13.67 μg/mL and 27.35 μg/mL. The optimal therapeutic dosage was 3 050 μg/(kg·d)to the fish illness resulted from Aeromonas hydrophila. The antibiotic compound in broth was stable to heat, pH, light and storage time by stability test.

【Keyword】：marine actinomycete; strain identification; fermental condition optimization; pharmacodymamic test; toxicity test
Source: Journal of Shanghai Fisheries University, Issue 5, 2008

Preparation of ciprofloxacin-carrier protein conjugation and identification of its products

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The conjugation of Ciprofloxacin-bovine serum albumin(BSA)is prepared via carbodiimide method, whereby the effect of pH, concentration of CIP and EDC to the coupling conjugation ratio is then assessed. Features of the conjugation, such as base group, molecular weight are then identified byinfrared spectrometry, ultraviolet spectrometry, polyacrylamide gel electrophoresis and mass spectroscopy. The result of Orthogonal Test shows that pH is significant to the coupling conjugation ratio of CIP and BSA molecules while concentrations of carbodiimide and ciprofloxacin are not. The coupling conjugation ratio of BSA will be 30：1 under conditions that the pH is 5.0,and concentration of carbodiimide and ciprofloxacin is respectively 60 mg/mL and 5 mg/mL under which conditions the coupling reaction works successfully. This method is easily applicable to conjugate CIP and BSA.

Keyword：ciprofloxacin; carbodiimide method; coupling conjugate; identification
Source: Journal of Shanghai Fisheries University, Issue 5, 2008

Effects of dietary lipid levels on growth and body pigmentation of darkbarbel catfish *(Pelteobagrus vachelli Richardson)*

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An experiment was conducted to investigate the effects of dietary lipid levels on growth and body pigmentation of Darkbarbel catfish. Five experimental diets containing different lipid levels(4.17%,7.02%,9.99%,13.00%,15.76%)were formulated and fed to apparent satiety to five groups of 25 fish for 13 weeks, each lipid level contained 60 mg/kg or 0 mg/kg xanthophylls.0 mg/kg xanthophylls and 8.92% lipid diet served as control. The results showed that:(1)At the end of 6th and 10th week ,the special growth rate and feed efficiency increased as the dietary lipid increased from 4.17%-9.99%,the viscerosomatic index(VSI)and intraperitoneal fat ratio(IPF)also increased as the dietary lipid level increased.(2)The concentration of xanthophylls in the skin of fish fed xanthophylls diets increased to a stage of stability after 5 weeks feeding.(3)The concentration of xanthophylls in skin of Darkbrbel catfish was higher when fed with soybean oil containing diets,7.02% crude fat was enough for the body pigmentation of Darkbarbel catfish.(4)The

concentration of xanthophylls in the skin of well pigmented Darkbrbel catfish would keep steady at least for 7 weeks rather than depigmented.(5)Melanin content in skin and tyrosinase activities of dorsal skin, subjacent lateral line skin and blood serum seemed no difference among all groups(P>0.05).

Keyword：Pelteobagrus vachelli; fat; growth; pigmentatim; melanin; tyrosinase
Source: Journal of Shanghai Fisheries University, Issue 5, 2008

Monthly investigation on water quality and water quality assessment of Shan-hong River,at town of Langxia

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By investigating water quality between Shan-hong Bridge and infall of Shan-hong River from March 2007 to March 2008,main water chemical indices were analyzed. The results showed that DO variation was mainly influenced by the water temperature. The lowest DO concentration was only 2.89 mg/L at the highest water temperature(32.0 ℃)in summer, which was only 39.7％ of the saturation(O2%);the maximum of DO concentration in winter was 14.19 mg/L with the saturation of 116.9％ in the river water under the bridge. Annual averages of DO concentration in two sampling points were 7.09 mg/L and 5.03 mg/L,BOD5 were 4.55 mg/L and 3.86 mg/L,CODMn were 12.85 mg/L and 12.50 mg/L, total inorganic nitrogen were 2.994 mg/L and 2.815 mg/L,orthophosphates average were 0.179mg/L and 0.229mg/L,respectively.Water quality at the sampling sites was assessed with the environment quality standards for surface water and Nemero method. The results showed that the status of sampling sites occupied between lightly polluted to polluted. The main pollution index was CODMn, and the secondary pollution index was NH3-Nt,followed by BOD5 and DO.

【Keyword】：water quality standard; Nemero Index method; water quality assessment; pollution
Source: Journal of Shanghai Fisheries University, Issue 5, 2008

Research on water quality and trophic level in Wulungu Lake

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An investigation on water quality of Wulungu Lake composed of Jili Lake and Buluntuo Lake was carried out from November 2006 to August 2007.We studied the changes of parameters as transparence, chlorophyll a,CODMn,TN and TP in the whole year. Appraisement was made by using TLI to evaluate the water trophic level of Wulungu Lake. The results showed the annual mean of

transparence was(2.53±1.07)m, Chla was(3.57±18.34)mg/m3,CODMn was(5.423±1.369)mg/L,TN was(0.856±0.205)mg/L,and TP was(0.028±0.033)mg/L. The trophic level of Buluntuo Lake was Mesotrophic(TLI=38.51). Jili Lake was moderate eutrophic in summer (TLI=60.90)while Mesotrophic in other seasons. The trophic levels of two lakes changed along with temperature which were higher in the summer and lower in the winter.In all seasons, the trophic level of area at the lakeside swimming ground,the Xiaohaizi and the Zhonghaizi Reproduction Conserration ground were Mesotrophic.Zhonghaizi(TLI=44.02)was a little higher than the average TLI of the lake. The eutrophic level of Houpaozi (TLI=72.96)was Hyper eutrophic in summer while Mesotrophic in other seasons. This investigation also showed that aquaculture might increase the eutrophication level of the water.The investigation indicated that water trophic level of Wulungu Lake was mesotrophic and the water quality of Buluntuo Lake was better than Jili Lake as a whole.

【Keyword】：Wulungu Lake; trophic state index; trophic level

Source: Journal of Shanghai Fisheries University, Issue 5, 2008

The influence of different environmental factors on the growth and survival rate of juvenile of bamboo clam Solen grandis

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This paper reports the growth and survival rates of juvenile of bamboo clam Solen grandis reared in different kinds of sediments, rearing densities and food concentrations. Results showed that(1)sediments affected both the growth and survival rates of juvenile. The group with fine sand had the highest growth rate,while the group with fine silt had the lowest. The survival rates ordered by the group with fine sand(64.25%)> the group with coarse sand(62.79%)> the group with fine silt(60.41%).(2)With the increasing of rearing density, the growth and survival rates of juvenile of S.grandis decreased.(3)With the increasing of food concentration, the growth rate of juvenile increased, while the survival rate rose at first, then dropped. The survival rate of the group with 20×l04 ind/mL food concentration was the highest. It is obvious that the diameter of sediment particle ranging from 0.25 mm to 0.063 mm was the best sediment media. It is suggested that the juvenile of S.grandis with shell length ranging from 5 mm to 10 mm, the rearing density be kept about 1×l04 ind/m2 and the food concentration be kept about 20×l04 ind/mL.

【Keyword】：Solen grandis; sediment; rearing density; food concentration; growth; survival

Source: Journal of Shanghai Fisheries University, Issue 5, 2008

Determination and analysis of inorganic arsenic in laver

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The content of inorganic arsenic in the laver from Fujian and Jiangsu Provinces of China and in the laver imported from Japan and Korea was determined by the first method of hydride generation atomic fluorescence spectrum(HG-AFS)in GB19643-2005,The results showed that the content of inorganic arsenic in laver determined by HG-AFS method was much higher than that prescribed in GB19643-2005 in China. In the condition of different acid degree 3%,8%,20% and adding the reducing agents or not, the hydride generation efficiency of DMA was determined, the results showed the hydride generation efficiency of DMA was 34.4% in the condition of HG-AFS method.The present study showed the cause that the content of inorganic arsenic in laver determined by HG-AFS method was much higher than that prescribed in GB19643-2005 in China,was that the extracted liquid contains DMA, which was the decomposing product of arsenic sugar after pretreatment by HG-AFS method. DMA would produce the same signal as that produced by inorganic arsenic when detecting by AFS. The signal would disturb the final result heavily.

【Keyword】：hydride generation atomic fluorescence spectrum; laver; inorganic arsenic

Source: Journal of Shanghai Fisheries University, Issue 5, 2008

Spermatozoa morphology and effects of environmental factors on spermatozoa motility in *Cyclina sinensis*

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The morphology of spermatozoa of Cyclina sinensis were investigated by light microscopy as well as electron microscopy.The effects of environmental factors on the sperm motility were also investigated by setting different gradients of salinity,pH and temperature. The sperm of Cyclina sinensis is pepper-shaped, with a slight curve on the head which consists of a conical acrosome and a columnar nucleus. The acrosome is about 0.8μm in length, with equally distributed materials in it. The subacrosomal space contains granular material. The nucleus is about 2.3μm in length, and 0.7-0.9μm in width, with high electronic density and equally distributed material in it. The nucleus also contains a post nuclear fossa. The tail is comprised of a mid-piece and an end piece. The mid-piece has five mitochondria which surround the proximal and distal centrioles. The whip-like end piece consists of an axoneme which is a typical " 9+2 " structure and plasma membrane which is around the axoneme. There are many differences in the morphology and the size of acrosome and nucleus, as well as the number of mitochondria in mid-piece among Cyclina sinensis, Ruditapes philippinarum, Paphia undulata, and Paphia exarata, which are all in the Family Veneridae. The optimal salinity for spermatozoa activation and motility is 20-25,the optimal pH is 8.0-9.0,and the optimal temperature is 25℃-30℃.The Cyclina sinensis spermatozoa has broad adaptation to environmental salinity and pH value, this reflects that this species adapts to the intertidal zone environmental changes.

【Keyword】：Cyclina sinensis; spermatozoa; morphology; motility; salinity; pH; temperature

Source: Journal of Shanghai Fisheries University, Issue 5, 2008

Comparison of anaesthetic effects of the electroanesthesia and chemical anesthesia to juvenile Acipenser schrenckii

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Experiments were conducted to investigate the acute toxicity of MS-222 and clove oil ,and the anaesthetic effect of MS-222,clove oil and direct current on juvenile Acipenser schrenckii[(71.2±8.9 g)],Besides, the validity of the three anaesthetic methods of the sturgeon on the ground of behavior observation was discussed. The result of toxicity experiments show that the 24 h L50,48 h L50,72 h L50,and 96 h L50 of clove oil and MS-222 to juvenile Acipenser schrenckii were 26.37 mg/L,22.17 mg/L,18.00 mg/L,16.22 mg/L and 61.67 mg/L,58.22 mg/L,56.90 mg/L,56.90 mg/L, respectively.The toxicity of MS-222 was obviously lower than clove oil, the safe concentration of clove oil and MS-222 were 4.70 mg/L and 15.57 mg/L respectively.The result of the anaesthesia experiments showed that:the fish lost its equilibrium within 3 minutes,and was completely at narcosis anaesthesia in 7 minutes. When exposed to a high concentration(MS-222 above 100 mg/L,clove oil above 50 mg/L, direct current above 12 V),and the fish recovered in 3 minutes. It was found that the relationship between the time, anaesthetic concentration and the direct current followed an exponential function, the related coefficient R2 was more than 0.9.The difference of the anesthetic results under different water temperature with the suitable direct current(24 V)was not significantly different. Under suitable anesthetics concentration(MS-222 100 mg/L,clove oil 50 mg/L),the complete anaesthesia time and water temperature were negative correlation, while recovered time and water temperature were positive correlation,and the related coefficient R2 were all more than 0.9.All the results indicated that three methods were all applicable to anaesthetize sturgeon, but the proper method should be chosen according to the different purposes. The anaesthesia time and recovery time in the electricity anaesthesia were so short that its physiology mechanism deserved further research.

【Keyword】：Acipenser schrenckii; direct current;MS-222;clove oil; temperature; acute toxicity; safety concentration

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Construction of cDNA library of a green microalga, Myrmecia incise

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The freshwater green microalga Myrmecia incisa was isolated from Mt. Tateyama, Japan. It is well-known by far that this microalga is the richest source of one polyunsaturated fatty acid(PUFA),arachidonic acid (20:4ω6,AA).Total RNA was isolated from this alga by Trizol method, and the cDNA library of M.incisa was constructed using SMART cDNA Library Construction Kit, Clontech,Inc. The titer of unampified library reached 6×106 pfu/mL,and the recombination rate was about 95.83%.PCR amplification of randomly selected positive clones illustrated the inserted cDNA fragments ranged from 0.5 kb to 1.5 kb,and the average length was about 1 kb. All these results suggested that the cDNA library was successfully constructed.

【Keyword】：Myrmecia incisa;cDNA library;arachidonic acid(AA)

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Studies on efficient methods of algae DNA isolation

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Simple and high efficiency methods for DNA preparation were the base for the algae molecular genetic research. To look for rapid and efficient methods to isolate DNA, three algae(Porphyra yezoensis,Enteromorpha clathrata and Spirulina platensis)were as materials to extract DNA by three preparation methods, improved CTAB method, LiCl method and extraction kit. These results indicated that the more extraction buffer was valid to remove impurities such as proteins and polysaccharides, and increased the yield and purity of DNA. Three methods have been improved and are all potent for genomic DNA extraction. Using the isolation kit was the most rapid method and the DNA purity was high, but expensive with low DNA yield.The improved CTAB method and the LiCl method were inexpensive and efficient methods for total genomic DNA isolation from 3 algal species, but the latter was more rapid and simple. Furthermore, the pretreatment of material also affected the quality of DNA.

【Keyword】：algae; DNA isolation; LiCl method

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Improvement and application of reverse transcription-polymerase chain reaction (RT-PCR) for the detection of taura syndrome virus in *Penaeus vannamei*

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Taura syndrome virus(TSV)was defined as List B Diseases pathogen of aquatic animals by Office International des Epizooties(OIE).A nested RT-PCR was developed and optimized for the detection of TSV,founding on the industry standard for RT-PCR of TSV. By sensitivity analysis, the nested RT-PCR developed was 3-log more sensitive than that of conventional RT-PCR for the detection of TSV, and a minimum of 10fg RNA was detected. Using the two RT-PCR techniques, TSV was detected in 52 of 180 clinical cultivated penaeid shrimps in Guangxi by nested RT-PCR, while 23 of 180 by conventional RT-PCR. Results demonstrated that the nested RT-PCR developed can boost positive detection rate of TSV, and be a more effective diagnostic tool in detecting TSV.

Keyword】:Taura syndrome virus; nested RT-PCR; sensitivity; positive detection rate

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Application of the unit τ_0 in optimizing induction of diploid gynogenesis goldfish,Carassius auratus

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Experiments on initiating time of heat shock during the first cleavage for optimizing inducfion of diploidization of the chromosome set were conducted in goldfish, Carassius auratus. Dimensionless measure of relative embryological age τ_0was used to express the time of heat shock operation. Water temperature of heat shock was 38-39 ℃,and duration time was 2 min ,in all experiments, while incubation temperature prior to treatment was switched to 20 ℃,22 ℃ or 25 ℃ in different groups. The results indicated, that the curves of hatching rate and normal diploid larva output showed a single peak, with the highest point at 3.4τ_0,corresponding to metaphase of the first mitotic division, the results were obtained irrespective of the different pre-treatment water temperatures, thus confirming the veracity of measuring heat-shock timing by τ_0and the wild applicability of this method in cyprinid and also suggesting a new way to the operations of induced gynogenesis in related fish.

【Keyword】：Carassius auratus;gynogenesis;unitτ_0;relative embryological age;optimization

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Genetic structure and population history of Coilia nasus in Yangtze River and its south adjacent waters

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To estimate the genetic structure and demographic history of Coilia nasus,55 individuals were sampled from 5 localities, which included Poyang Lake(PY), Taihu Lake (TH)and Jiuduansha area(JJ)in Yangtze River system, Qiantangjiang River estuary(QT)and Zhoushan(ZS). Mitochondrial DNA variation was analyzed using DNA sequence data from the complete control region.Genetic structure analysis showed a high level genetic diversity of C.nasus (h=0.9983,π=0.0420),which indicated that C.nasus had high evolutionary potential. High level of Nm values(0.67-40.14)and low Fst values(0.013-0.426),average K 2-P distances,as well as AMOVA analysis all revealed that the C.nasus had no obviously geographical differentiation. However, the phylogenetic tree estimated by Neighbor-Joining(NJ)methods indicated that the individuals of C.nasus formed two monophyletic lineages, and the two lineages without correlation with geographical populations. Both neutrality tests and network analysis suggested a late Pleistocene population expansion for C.nasus(0.17-0.13 million years ago),and climatic oscillations during the Pleistocene ice ages produced great changes in this species' geographical distribution and abundance.

【Keyword】：Coilia nasus; mtDNA control region; genetic structure; Yangtze River and adjacent waters

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