

AQUACULTURE ASSOCIATION OF SOUTHERN AFRICA: MAILING LIST

From: Brummett, Randall (WorldFish) [mailto:r.brummett@CGIAR.ORG]

Sent: 01 April, 2008

I have for many years maintained a mailing list to disseminate opportunities and new information pertaining to fisheries and aquaculture in Africa. As the sector becomes better organized and more professional, a number of similar lists have evolved. To try and work together as much as possible to create critical mass and a common perspective, the Aquaculture Association of Southern Africa, a non-profit organization that seeks to share information and represent the continent's fish farming community and I have agreed that my periodic news items will be in future shared through their monthly newsletter. This increases the size of our network and the possibilities for productive collaboration. If you want to receive a copy of our newsletter, please contact me.

In addition, new networking efforts are underway to establish the Aquaculture Network for Africa (ANAF) which seeks to create synergies among Africa's widely dispersed aquaculture research community. An early project that is collaborating and hoping to reinforce ANAF is SARNISSA, a 3-year project being run by the University of Stirling, WorldFish and CIRAD. You will be hearing more about these two initiatives anon. It would be excellent if you can avail yourselves of these networks to identify regional projects to reinforce the knowledge base and expertise upon which African aquaculture can grow.

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INFORMATION OF INTEREST

Aquaculture [on-line publications](#) of the University of Florida, USA

Danish Knowledge- Cluster for continuous development of Recirculation Technology in Aquaculture: [AquaCircle](#)

Tilapia production booming: [FAO report](#)

[Information technology exercises](#) available for self-training, providing a broad background in general computer operations, which all working scientists should have today.

[OceanPortal](#): a high-level directory of Ocean Data and Information related web sites. Its objective is to help scientists and other ocean experts in locating such data & information.

[OceanTeacher](#): a training resource for data and information management related to oceanography and marine meteorology

[Open Science Directory](#): search tool for open access journals and journals in special programs for developing countries

Aquaculture Twin Event – Patras, Greece 2007 [presentations](#)

VLIZ Library Acquisitions:

no [389 March 21, 2008](#)

no 390 April 4, 2008

VLIZINE (dutch)
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EXPOSURE OF GNOTOBIOTIC ARTEMIA FRANCISCANA LARVAE TO ABIOTIC STRESS PROMOTES HEAT SHOCK PROTEIN 70 SYNTHESIS AND ENHANCES RESISTANCE TO PATHOGENIC VIBRIO CAMPBELLII

Sung Y.Y., Pineda, C., MacRae, T.H., Sorgeloos, P., Bossier, P.-2008

Cell Stress and Chaperones 13: 59-66

Abstract:

Larvae of the brine shrimp *Artemia franciscana* serve as important feed in fish and shellfish larviculture; however, they are subject to bacterial diseases that devastate entire populations and consequently hinder their use in aquaculture. Exposure to abiotic stress was shown previously to shield *Artemia* larvae against infection by pathogenic *Vibrio*, with the results suggesting a mechanistic role for heat shock protein 70. In the current report, combined hypothermic/hyperthermic shock followed by recovery at ambient temperature induced Hsp70 synthesis in *Artemia* larvae. Thermotolerance was also increased as was protection against infection by *Vibrio campbellii*, the latter indicated by reduced mortality and lower bacterial load in challenge tests. Resistance to *Vibrio* improved in the face of declining body mass as demonstrated by measurement of ash-free dry weight. Hypothermic stress only and acute osmotic insult did not promote Hsp70 expression and thermotolerance in *Artemia* larvae, nor was resistance to *Vibrio* challenge augmented. The data support a causal link between Hsp70 accumulation induced by abiotic stress and enhanced resistance to infection by *V. campbellii*, perhaps via stimulation of the *Artemia* immune system. This possibility is now under investigation, and the work may reveal fundamental properties of crustacean immunity. Additionally, the findings are important in aquaculture where development of procedures to prevent bacterial infection of feed stock such as *Artemia* larvae is a priority.

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LIPID CONTENT AND FATTY ACID COMPOSITION OF MUSCLE, LIVER, OVARY AND EGGS OF CAPTIVE-REARED AND WILD SILVER JAPANESE EEL *ANGUILLA JAPONICA* DURING ARTIFICIAL MATURATION

Yuichi Ozaki, Hidehiro Koga, Takako Takahashi, Shinji Adachi, Kohei Yamauchi-2008

Fisheries Science 74(2): 362-371

Abstract:

Changes in lipid content and fatty acid composition of muscle, liver and ovary of captive-reared and wild silver Japanese eel *Anguilla japonica* were examined during artificial maturation induced by salmon pituitary homogenate (SPH) injections. Although the relative levels of n-3 and n-6 highly unsaturated fatty acids (HUFA) in liver and ovary were higher than in muscle in both captive and wild silver eels before SPH injection, these tended to decrease with maturation. The relative levels of n-6 HUFA in muscle, liver, ovary and eggs of wild silver eels were remarkably higher than those in captive eels. Therefore, we attempted to alter the ratio of n-6 HUFA in eggs by feeding eels a diet supplemented with linoleic acid-rich plant oil. Although the percentage of n-6 polyunsaturated fatty acids to total fatty acids in eggs of eels fed the supplemented diet was similar to wild silver eels, the percentage of n-6 HUFA remained remarkably lower than in wild silver eels. Hence, it appears that the supplemented diet affected the fatty acid composition of eggs, but did not result in much conversion of linoleic acid to its higher homologs in eels.

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EXPRESSION PROFILE OF CYTOKINE AND TRANSCRIPTION FACTOR GENES DURING EMBRYONIC DEVELOPMENT OF ZEBRAFISH DANIO RERIO

Kanako Ito, Fumio Takizawa, Yasutoshi Yoshiura, Mitsuru Ototake, Teruyuki Nakanishi-2008

Fisheries Science 74 (2): 391–396

Abstract:

Cytokines are a group of proteins that are involved in a variety of immunological and inflammatory reactions. Recently, it has been reported that cytokine genes also play an important role during development in mammals. In fish, however, little is known about the role of immune-related genes during embryogenesis. Here, we report the mRNA expression of some cytokines and transcription factors during embryonic development in zebrafish. In reverse transcriptase polymerase chain reaction (RT-PCR) analysis, the expression of *il1b*, *tnfb*, *ifn1*, *il12ba*, *eomesa* and *eomesb* genes were detected before the development of the immune system in zebrafish embryos. Genes *il1b*, *tnfb* and *eomesb* showed high level expression at the specific stages, while *eomesa* was highly expressed at all the stages examined. Moreover, the difference in expression pattern was observed between two isoforms of *tnf* and *eomes* genes. These results suggest that immune genes expressed at early embryonic stages are not involved in immunity but development, and two isoforms have different functions not only in adulthood but also during embryonic development.

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SHORT PAPER

OFFSHORE COLLECTION OF LARVAL JAPANESE FLOUNDER PARALICHTHYS OLIVACEUS: IMPLICATION FOR TRANSPORT-INDUCED MORTALITY

Takeshi Tomiyama, Takuji Mizuno, Daisuke Uenoyama, Masahiro Enomoto, Tadahiro Sohtome-2008

Fisheries Science 74 (2): 449–451

(Prefectural Fisheries Experimental Station, Iwaki, Fukushima 970-0316, Japan; email of Takeshi Tomiyama: tomiyaama_takeshi_01@pref.fukushima.jp)

SHORT PAPER

DELAYED GROWTH OF ALBINO IN JAPANESE FLOUNDER LARVAE AND JUVENILES

Yukinori Shimada, Tadahisa Seikai-2008

Fisheries Science 74 (2): 455–457

(Graduate School of Biosciences and Biotechnology, Fukui Prefectural University, Obama, Fukui 917-0003, Japan; email of T. Seikai: seikai@fpu.ac.jp)

MONITORING THE OPPORTUNISTIC BACTERIA PSEUDOALTEROMONAS SP. LT-13 IN A GREAT SCALLOP, PECTEN MAXIMUS HATCHERY

Ruth-Anne Sandaa, Laila Brunvold, Thorolf Magnesen, Øivind Bergh-2008

Aquaculture 276(1-4): 14-21

Abstract:

PCR with specific primers against *Pseudoalteromonas* sp. LT-13, and Denaturing Gradient Gel Electrophoresis (DGGE) of PCR-amplified 16S rDNA, was used to monitor the bacterial community in samples of early stages of scallop larvae suffering high mortality. Samples were taken of larvae from different tanks, water in the tanks, eggs/sperm, inlet water and algal cultures. The DGGE profiles revealed one dominating band that was always present in

samples of scallop larvae suffering high mortality. The band was sequenced and demonstrated high sequence homology to *Pseudoalteromonas* sp. LT-13, a bacterium previously isolated from the hatchery. Samples from different locations in the production unit were collected four times in an 11-month period and tested for the presence of LT13 by PCR. Seventy-four percent of the samples collected in April 2003 contained LT-13. In this period the mortality of the scallop larvae was no less than 96.8%. In two of the other samples the mortality was moderate (83.3–78.0%), and LT-13 was detected in 30 and 57% of these samples. High mortality (98.3%) also occurred in the February 2003 sampling period; however, LT-13 was detected in just 39% of the samples. These results indicate that the bacterium is not an obligate pathogen, but rather an opportunistic bacterium that may be used as an early indicator of the conditions in the hatchery.

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MANAGEMENT OF NAUPLIUS PRODUCTION IN THE PARACALANID, *BESTIOLINA SIMILIS* (CRUSTACEA: COPEPODA): EFFECTS OF STOCKING DENSITIES AND CULTURE DILUTION

Kyle VanderLugt, Petra H. Lenz-2008

Aquaculture 276(1-4): 69-77

Abstract:

Bestiolina similis cultures were managed to increase nauplius production. Higher nauplius production was achieved by increasing the initial stocking densities of adults and sub-adults (C5–C6). However, these periods of high nauplius production were short compared to cultures stocked at lower C5–C6 densities. Female fecundity was inversely related to stocking densities and with the age of the culture. Populations of *B. similis* were periodically diluted by either reseeded or upscaling of the experimental cultures. Following dilution, population densities remained constant for 1 to 8 days and then increased linearly at rates ranging from 270 to over 600 ind L⁻¹ D⁻¹. In these cultures, female fecundity declined from 28 to 11 eggs per female per day. Timing of the culture dilution is important. Cultures, diluted during the period of population increase, had higher rates of increase and reached higher densities than the late-diluted cultures. Enrichment of diluted cultures with copepodites (C5–C6) shortened the delay and produced higher rates of population increase and maximum densities. Management of the population through dilution of cultures and manipulation of adult stocking densities improved nauplius production in the cultures. Increasing and predicting nauplius production are two primary steps towards the use of copepod nauplii as first feeds.

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USE OF SPECIFIC BACTERIAL-MICROALGAL BIOFILMS FOR IMPROVING THE LARVAL SETTLEMENT OF *ARGOPECTEN PURPURATUS* (LAMARCK, 1819) ON THREE TYPES OF ARTIFICIAL SPAT-COLLECTING MATERIALS

Yanett E. Leyton, Carlos E. Riquelme-2008

Aquaculture 276(1-4): 78-82

Abstract:

In hatcheries of *Argopecten purpuratus* it is a common practice to harvest the larvae in collectors covered with a coat of microbial biofilm to promote larval settlement. The biofilm coating is obtained by immersion of the collectors for a few days in seawater prior to its use in a process called “pre-conditioning”. The present study was an attempt to evaluate the pre-conditioning process of exposing three different brands of imported and locally produced collector materials (“Netlon”) to biofilms formed by the bacterium *Halomonas* sp. and the diatom *Amphora* sp. The results showed the highest degree of settlement of larval scallops on mature biofilms (90 + h), but there were no significant substrate Netlon-dependent differences. Tests with Chilean-produced Netlon seeded with varied concentrations of

Halomonas sp./Amphora sp. promoted settlement of the larval scallops better than naturally deposited microbial films. Future research is required to determine more precisely what substances or physical characteristics of the biofilms are effective in inducing larval settlement.

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EFFECTS OF DIETARY LIPIDS ON THE FATTY ACID COMPOSITION AND LIPID METABOLISM OF THE GREEN SEA URCHIN *STRONGYLOCENTROTUS DROEBACHIENSIS*

Enrique González-Durán, John D. Castell, Shawn M.C. Robinson, Tammy J. Blair-2008

Aquaculture 276(1-4): 120-129

Abstract:

The effects of different dietary lipids (hydrogenated coconut oil, corn oil, linseed oil, and mixtures of corn oil, linseed oil, menhaden oil, and/or soy lecithin) on the fatty acid composition of the sea urchin *Strongylocentrotus droebachiensis* were investigated. Dietary lipid compositions were reflected in the fatty acid profiles of sea urchin guts, gonads and shells. The shells had the highest level of 20:4n-6 and 20:5n-3, while the highest levels of monounsaturated fatty acids were seen in the guts. Tissue levels of 20:4n-6 and 20:5n-3 were influenced by the dietary levels of 18:2n-6 and 18:3n-3. The addition of soy lecithin to the diet (CLnML) enhanced the production and incorporation of 20:4n-6 in shell and gonad. Sea urchin also synthesized and incorporated 20 and 22 carbon non-methylene-interrupted dienoic fatty acids (NMIDs) in all tissue lipids. The NMID content varied among the different tissues and was influenced by the dietary lipid source. The hydrogenated coconut oil (HCO) diet resulted in the greatest NMID content, while the lowest levels were seen in sea urchins fed diets containing a mixture of corn oil, linseed oil, menhaden oil and lecithin (CLnML). The NMID content was lowest in gut and highest in the shell. Significant levels of mead acid (20:3n-9) were detected in the shells of sea urchins fed the EFA-deficient diet (HCO). The enzymatic capabilities of sea urchins to desaturate and elongate 18:2n-6 to 20:4n-6 and 18:3n-3 to 20:5n-3, as well as the capabilities to de novo synthesize NMID were hypothesized. Possible physiological roles and mechanisms for formation of NMID are discussed.

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BIOCHEMICAL CHARACTERIZATION AND NUTRITIONAL VALUE OF THREE PAVLOVA SPP. IN UNIALGAL AND MIXED DIETS WITH *CHAETOCEROS MUELLERI* FOR POSTLARVAL SEA SCALLOPS, *PLACOPECTEN MAGELLANICUS*

Lisa M. Milke, V. Monica Bricelj, Christopher C. Parrish-2008

Aquaculture 276(1-4): 130-142

Abstract:

Low growth and survival of sea scallops, *Placopecten magellanicus*, are often observed during postlarval stages when they undergo a period of protracted morphogenesis and thus may be particularly susceptible to nutritional deficiencies. Diets containing flagellates from the genus *Pavlova* (especially *Pavlova* sp. CCMP 459) have proven successful for scallop rearing in previous studies. To further examine their contribution to growth performance, *Pavlova* sp. (CCMP 459) and *Pavlova pinguis*, both as unialgal diets and in combination with the diatom *Chaetoceros muelleri* (CHGRA), were tested as diets for postlarval (~ 350 µm and 1.6 mm) sea scallops in two growth trials each lasting ~ 4 weeks. The Pav 459- and *P. pinguis*-CHGRA combination diets yielded high and comparable growth of postlarvae whereas previous work found substantial decreases in growth rate (31%) when another algal species of the same genus, *Pavlova lutheri*, was substituted for Pav 459 in the combination diet. In the present study a unialgal diet of *P. pinguis* yielded growth rates 32% lower than the combination, and unialgal diets of *C. muelleri* consistently ranked lowest of all diets tested

(54–65% lower than the combination). Algal sterol composition may influence scallop growth performance, as CHGRA contains high levels of cholesterol, also present although to a lesser extent, in Pav 459 and *P. pinguis*. *P. pinguis*, Pav 459, and *C. muelleri* are also all characterized by relatively high levels of n-6 polyunsaturated fatty acids (PUFA). Pav 459 and *P. pinguis* (in contrast to *P. lutheri*) are characterized by high levels of docosapentaenoic acid (DPA, 22:5n-6), and *C. muelleri* contains high levels of arachidonic acid (AA, 20:4n-6) which may account for the higher growth obtained on this mixed diet. Enrichment of Σ n-6 fatty acids, as well as of the individual n-6 fatty acids AA and DPA, was observed in scallop tissues relative to the diet across dietary treatments. However, no enrichment of Σ n-3 fatty acids was observed, which provides evidence of selective uptake, retention and/or metabolism of n-6 fatty acids. This study strongly supports the role of n-6 DPA as an essential nutrient for scallop early life history stages.

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THE INFLUENCE OF DIETARY CONCENTRATIONS OF ARACHIDONIC ACID AND EICOSAPENTAENOIC ACID AT VARIOUS STAGES OF LARVAL ONTOGENY ON EYE MIGRATION, PIGMENTATION AND PROSTAGLANDIN CONTENT OF COMMON SOLE LARVAE (*SOLEA SOLEA* L.)

Ivar Lund, Svend Jørgen Steinfeldt, Gary Banta, Benni Winding Hansen-2008
Aquaculture 276(1-4): 143-153

Abstract:

Dietary manipulations of arachidonic acid, ARA and eicosapentaenoic acid, EPA may have an influence on pigmentation in common sole larvae (*Solea solea* L., Linnaeus 1758) which may be related to a “pigmentation window”. This is a specific period in the larval ontogeny where nutritional factors determine pigmentation.

Malpigmentation defined as hypomelanosis was significantly related to elevated dietary and larval ARA contents, but not to EPA. The study reports evidence for a pigmentation window, as larval sensitivity to ARA or its derivatives was much higher during premetamorphosis, than during metamorphosis.

Initiation of metamorphosis (i.e. start of eye migration) was related to the size of larvae and not related to ARA or EPA content. Dietary EPA or DHA did not retard the advance of eye migration.

More than 90% of highly malpigmented juveniles, (i.e. “albinos”) had a permanent aberrant eye migration, which was not related to dietary treatments. This malformation was not observed in normal or slightly malpigmented juveniles.

Mean larval ARA tissue contents, malpigmentation and prostaglandin, PGE2 tissue contents were significantly positively correlated. PGE2 levels and pigmentation were not affected by dietary or larval EPA contents. Consequently ARA induced prostaglandins are suggested to be involved in malpigmentation in common sole.

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EFFECTS OF REPLACEMENT OF DIETARY FISH OIL BY SOYBEAN OIL ON GROWTH PERFORMANCE AND LIVER BIOCHEMICAL COMPOSITION IN JUVENILE BLACK SEABREAM, *ACANTHOPAGRUS SCHLEGELI*

Shiming Peng, Liqiao Chen, Jian G. Qin, Junli Hou, Na Yu, Zhangqiang Long, Jinyun Ye, Xinjin Sun-2008

Aquaculture 276(1-4): 154-161

Abstract:

A 9-week feeding experiment was carried out on juvenile black seabream *Acanthopagrus schlegeli* to evaluate the effects of dietary replacement of fish oil by soybean oil on fish growth and liver biochemical composition. Fish in triplicate were fed four diets, in which 0%

(FO as control), 60% (60SO), 80% (80SO) and 100% (100SO) of fish oil was replaced by soybean oil. The weight gain of fish fed 60SO or 80SO diet was similar to that of fish fed the control diet, but a total replacement of fish oil by soybean oil significantly reduced fish growth. Although the inclusion of soybean oil resulted in an increase in the crude lipid content of the liver, the level of fish oil replacement did not significantly alter the hepatosomatic index, feed conversion ratio, condition factor and liver proximate composition. The inclusion of soybean oil in seabream diets increased hepatic -tocopherol concentrations, but reduced thiobarbituric acid-reactive substances and plasma cholesterol. Linoleic acid and linolenic acid significantly increased in fish fed soybean oil diets, but docosahexaenoic acid, eicosapentaenoic acid and the ratio $n - 3/n - 6$ were significantly reduced by the inclusion of dietary soybean oil ($P < 0.05$). Our results indicated that the inclusion of soybean oil increased the hepatic -tocopherol content and reduced lipid peroxidation in fish. However, complete substitution of fish oil with soybean oil reduced growth efficiency. Thus, 60–80% replacement of fish oil by soybean oil is recommended in diet formulation for black seabream.

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EGG AND SPERM PRODUCTION AND QUALITY OF SHARPSNOUT SEA BREEM (DIPLODUS PUNTAZZO) IN CAPTIVITY

Maria Papadaki, Mihaela Papadopoulou,, Irini Siggelaki, Constantinos C. Mylonas-2008

Aquaculture 276(1-4): 187-197

Abstract:

Egg production from captive-reared sharpsnout sea bream (*Diplodus puntazzo*) was monitored during the spawning seasons of 2003 to 2005, and sperm production during 2003. Spawning took place between September and December under water temperatures of 21.0–18.5 °C. Daily fecundity varied without a consistent trend and peak egg production occurred in October. Mean (\pm S.E.M.) number of spawning days per month was 20 ± 3 in 2003, and 14 ± 3 in 2004 and 2005. A significant (ANOVA, DNMR, $P < 0.01$) drop was observed in mean total annual relative fecundity from 4.9 ± 0.08 million eggs kg^{-1} female body weight in 2003, to 2.4 ± 0.07 million eggs kg^{-1} in 2004 and 2005. Mean monthly fertilization success also dropped significantly from $81 \pm 1\%$ in 2003 to $76 \pm 2\%$ in 2004 and $78 \pm 2\%$ in 2005. Annual hatching success did not vary significantly and was around $86 \pm 2\%$. Finally, 5 day larval survival decreased significantly from $85 \pm 2\%$ in 2003 to $44 \pm 3\%$ in 2004. The first spermiating males were found in August and sperm production continued until December. Mean total volume of expressible sperm was maximal in November (3 ± 1 ml kg^{-1}) and the gonadosomatic index (GSI) ranged between 0.6 and 2.0% in spermiating fish, reaching its peak in September–November. Sperm motility (%) remained unchanged during the season, whereas motility duration (6.2 ± 1.7 min) and sperm density ($2.7 \pm 0.2 \times 10^{10}$ spermatozoa ml^{-1}) peaked in October. Mean sperm survival ranged between 9 and 13 days during most of the spawning season, and decreased significantly to 5 days in December. The study suggests that egg production is stable for the first 3 months of the spawning season, with relatively unchanged egg quality. On the contrary, sperm production and quality peaks in the middle of the reproductive season in October.

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EFFECTS OF BROODSTOCK DENSITY AND DIET ON REPRODUCTION AND JUVENILE CULTURE OF THE LEECH, HIRUDINARIA MANILLENSIS LESSON, 1842

Bin Zhang, Qiang Lin, Junda Lin, Xialing Chu, Junyi Lu-2008

Aquaculture 276(1-4): 198-204

Abstract:

The leech *Hirudinaria manillensis*, Lesson 1842 is of much interest for clinical and medicinal use. In this study, the effect of broodstock density (5, 10, 15, 20, 25, 30 and 50 ind tank⁻¹) on the reproductive efficiency of *H. manillensis* was examined. After 4 months of culture, the number of cocoons produced was significantly different among the different broodstock densities ($F_{6, 34} = 4.560$, $P < 0.05$), but fertilization ratio was not ($F_{6, 34} = 1.319$, $P = 0.285$). The average number of hatchlings per cocoon (5.72 ± 0.13 ind) and hatching rate ($96.82 \pm 1.31\%$) of the cocoons in the 5 ind tank⁻¹ treatment were significantly higher than those of the other treatments. The 50 ind tank⁻¹ treatment had the highest mortality of parent leeches ($29.60 \pm 2.48\%$). The size and wet weight of the cocoons were significantly different among the treatments, with the 5 ind tank⁻¹ treatment having the largest cocoon size (standard length and diameter) and wet weight. The time of juvenile release from the cocoons did not differ significantly among the different broodstock densities ($P > 0.05$).

The effect of diet (FT1: live bullfrog, FT2: fresh cattle blood, and two blood plasma preparations FT3: NP-2002a and FT4: NP-2002b) on the feeding, growth and survivorship of the juvenile leeches was also studied. After 2 months of culture, juveniles in the FT2 (fresh cattle blood) treatment had the highest total food intake (13.11 ± 0.07 g). Juveniles in the FT3 (NP-2002a) and FT1 (live bullfrog) treatments had a significantly high feeding ratio $95.00 \pm 1.16\%$ and $91.33 \pm 1.20\%$, respectively. Percentage weight gain (WG) and specific growth rate (SGR) of the juveniles in the treatment FT4 (NP-2002b) were the lowest, at $168.52 \pm 15.82\%$ and $1.64 \pm 0.10\%$, respectively. Juveniles in the FT3 (NP-2002a) and FT4 (NP-2002b) treatments had the highest survival rates, at $96.00 \pm 0.58\%$ and $84.33 \pm 0.88\%$, respectively.

(State Key Laboratory of Biocontrol, Institute of Aquatic Economic Animals and Guangdong Provincial Key Laboratory for Aquatic Economic Animals, Sun Yat-Sen (Zhongshan) University, Guangzhou 510275, PR China; email of Qiang Lin: linqiangzsu@163.com)

SHORT COMMUNICATION

EFFECT OF HIGH TEMPERATURE DURING EMBRYOGENESIS ON THE SEX DIFFERENTIATION PROCESS IN THE NILE TILAPIA, *OREOCHROMIS NILOTICUS*
Carole Rougeot, Christian Prignon, Cyrille Valence Ngouana Kengne, Charles M elard-2008
Aquaculture 276(1-4): 205-208

Abstract:

The aim of the present study was to environmentally (with temperature) modify the normal pathway of sexual differentiation during embryogenesis in Nile tilapia. Shortly after natural reproduction (< 12 h) between XX males and XX females, spawns ($n = 4$) of tilapia were incubated at 27 °C (control group), 34, 35 and 36 °C for the rest of the embryonic development. After 3 months of rearing, 100 fish (MBW = 3–6 g) per batch were sacrificed and the sex ratio determined with the acetocarmine squash method. Survival rate at hatching significantly decreased with increasing temperature (49.5% and 29.8% at 27 and 36 °C respectively). Sex ratios of the control group (27 °C) were 100% females whereas a significant proportion of males (from 6.0 to 26.7%) appeared in all treated groups. The mean percentage of males was increased in high temperature: 9.7, 18.2 and 17.5% of males at 34, 35 and 36 °C respectively. These results prove for the first time the possibility to modify the normal pathway of sexual differentiation during the embryonic development of Nile tilapia, before the apparition of the reproductive system.

(Research and Education Center in Aquaculture, CEFRA, University of Li ge, 10 Chemin de la Justice, B-4500 Tihange, Belgium; email of C. Rougeot: C.Rougeot@ulg.ac.be)
