

INFORMATION OF INTEREST

- Proceedings of the 2nd Global COE Program Symposium of Kinki University, South Australian Research and Development Institute, Henley Beach, Adelaide, Australia, Dec 1-2, 2009 “Sustainable aquaculture of the bluefin and yellowfin tuna – closing the life cycle for commercial production”
- English language style guide: word choice, punctuation, figure and table design, proofreading, etc.
- INASP (International Network for the Availability of Scientific Publications) Newsletter
- The fish larva: a transitional life form, the foundation for aquaculture and fisheries. 2009 Research Council of Norway Report from a working group on research on early life stages of fish.
- FAO Fisheries Technical Paper. No. 498: Cage Aquaculture, regional reviews and global overview

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EAS STUDENT GROUPNEWSLETTER December 2009

Bringing students and young aquaculturists together!

Dear EAS members, dear fellow students!

1. Aquaculture Europe 2009 workshop and field trip

The latest Aquaculture Europe conference entitled "New Research Frontiers" in Trondheim (Norway) has passed with a great success for us, aquaculture students! AE hosted this year the 4th international workshop for students and young aquaculturists. Around 40 students from across Europe and guest-students from all over the world participated with great enthusiasm on 15th of August. The workshop program included not only a dedicated session-program with lectures and seminars, but also a full-day field-trip on 14th of August to a neighboring salmon and a cod hatchery outside of Trondheim. All the programs were free for EAS and EAS Student Group members, and for anyone who registered to AE2009 conference and applied for the field trip by sending an email to info@eassg.org.

Lectures covered a wide range of student-relevant topics on the workshop. Firstly, we gave a short overview about the formation of the EAS Student Group, its past events such as workshops and field trips and opportunities for travel grants for Aquaculture Europe student participants. The need to increase the network of national coordinators and local student committees within the Student Group was highlighted as it is and stays of high priority in the near future.

Secondly, 'PhD Curriculum Development and Assessment' opportunities for students within the European thematic network for aquatic sciences (AQUAT-NET project, www.aquatnet.com) were presented by Peter Bossier, University Gent. One of the Aqua-TNET member services is the access to an interactive PhD Webportal. The PhD-Database is constructed as a valuable information and research tool for Aqua-TNET members. Its goal is to gather scientific and background information on finished doctoral research work throughout Europe, in a structure as compact and transparent as possible. Aqua-TNET members can find (links to) full PhD - manuscripts, abstracts, related articles and author information. When available and free of copyright and privacy hampering, on-demand video streaming of the PhD - defense is possible. <http://www.phdportal.ugent.be/portal.html>

'How to plan and manage our PhD studies in an effective way' was the next lecture with several practical tips by Prof. Gavin Burnell, University College Cork. Outstanding was the talk about how to stand out of the crowd by making great poster presentations by Catarina Martins from Wageningen

University. Workshop participants got feedback on their own posters during a practical exercise. Marc Verdegem, editor of the peer-reviewed journal *Aquaculture Research* focused on how to get a paper published. Plenary discussion among the workshop participants gave an excellent feedback on the workshop and revealed a high demand for networking and exchange of information among students.

A group of eight workshop participants went on a field trip to visit two fish farms near Trondheim. Both the salmon hatchery (operated by Lerøy) and the cod hatchery (operated by Atlantic cod juveniles) opened their gates for the EAS-SG delegation and allowed a deep insight into their facilities. These flow-through systems produce several million juveniles per year to be transported to on-growing sites all over Norway. Huge swarms of fish could therefore be admired by field trip participants, while the hatchery staff patiently answered all visitors' questions. Field trip was sponsored by European Aquaculture Society and Norwegian University of Science and Technology (NTNU).

2. Poster award at AE2009 by EAS-SG for student member

For the first time, our EAS Student Group awarded a best student poster during AE 2009 conference. This student poster award was presented for the first time in memory of Prof. Dr. İbrahim Okumuş (1960-2008), the Dean of the Fisheries Faculty in Rize University, Turkey, who passed away on 5th of December 2008. Prof Dr İbrahim Okumuş was one of the scientific pioneers of Turkish Aquaculture and worked tirelessly to promote its sustainable development - both at a national level but also internationally and notably through the FAO European Inland Fisheries Advisory Commission. Prof.Dr.İbrahim Okumuş was a loyal and active member of EAS and was the programme co-chair of Aquaculture Europe 2007 in Istanbul, Turkey. He was also active in many European initiatives and research projects. The first edition of the prize was kindly sponsored by AKUA MAKSA company in Turkey and the prize (€300) was awarded to best poster submitted by a student at AE2009, judged on the criteria of the presentation of the poster, its message and its attractiveness to make delegates want to read it. EAS-SG İbrahim Okumuş Poster Award was awarded to Francesco Pascoli and colleagues from the University of Padua, Italy: "Whole body cortisol and expression of inducible Hsp70 mRNA during ontogenesis of Sea bass (*Dicentrarchus labrax*) subjected to heat shock" D. Bertotto, F. Pascoli*, E. Negrato, C. Poltronieri, S.Sivieri, G. Radaelli, and C. Simontacchi
It is hoped that this award will be made on a regular basis – and especially in Porto at AE2010. The EAS Student Group would therefore be more than happy to receive pledges from potential sponsors for future awards.

3. Aquaculture Europe 2010

The next workshop will be held during Aquaculture Europe 2010 from 5th to 08th of October in Porto (Portugal). Therefore, we want to encourage you, students and people under the age of 30, to show your interest and send us your ideas and suggestions on topics you would like to discuss/elaborate during our next Student Group workshop in Porto. Like in the years before, we will also organize a field trip to a fish farm near Porto. Early registration for this special event will be promoted on our website and is highly recommended.

If any other information interests you, please visit our website: www.eassg.org.

4. New Board 2009-2010

The European Aquaculture Society Student group has a new board since August, 2009 consisting of the following people:

President: Magdolna Trenovszki, Hungary

President-Elect: Stefan Meyer, Germany

Treasurer: Anamaria Rekecki, Belgium

Secretary: Benedikt Frenzl, Germany

IT-Officer: Guerrino Macori, Italy

5. Membership

EAS-SG would really appreciate your help to build out a global community of young persons working and studying in the field of aquaculture and other aquatic sciences Please spread the news around your university or company. Do contact us and tell us to whom we should send information, newsletter at

your institution. Any individual can become a member of the EASSG by showing interest and by first joining the European Aquaculture Society.

To be a member, the following standards must be met:

a. Students and young people (under the age of 30) inclusive (proof of age is required) with a special interest in aquaculture, fisheries and other aquatic sciences can be members. Current Student (Young Person) members of EAS when they become 30 years old may remain student member of EAS for the period that they remain enrolled as students, and upon presentation of proof that this is the case. Persons that enrol in their studies after an age of 30 may become Individual Members of EAS-SG, but need to pay the regular fee set by EAS.

b. Members must pay annual dues set by the EAS.

Check out the new EAS website and membership fees: www.easonline.org.

Reduced EAS (student and young person) membership fee is 55 Euro.

Special offer for old and new members:

EAS-SG has a special offer for students and young people joining the EAS or renewing their membership for 2010! Five randomly chosen EAS-SG members will get the following EAS-SG presents:

1. "Options méditerranéennes" from the CIHEAM. A book entitled "The use of veterinary drugs and vaccines in Mediterranean aquaculture";
2. A book from CIHEAM entitled "Advances in fish reproduction and their application to broodstock management: a practical manual for sea bass";
3. an EAS-SG T-shirt;
4. an EAS-SG pendrive;
5. an EAS-SG pendrive.

The deadline for application for EAS membership and joining EAS-SG through our website) is 14th of February, 2010.

We hope you will enjoy and benefit from the EAS Student Group!

We are open for all your ideas! So mail us to info@eassg.org and we'll be pleased to take into account all your needs!

Best regards, Magdolna, Stefan, Anamaria, Benedikt, and Guerrino,
EAS Student Group Executive Board

AQUA-TNET NEWSLETTER January 2010

This is a free e-mail news service provided by AQUA-TNET for the AQUA-TNET network and its partners. AQUA-TNET is the European Thematic Network in the field of aquaculture, fisheries and aquatic resource management, funded under the European Commission Lifelong Learning Programme, from 2008 - 2011.

In the AQUA-TNET Newsletter you will find an update of AQUA-TNET and its activities, as well as information from the European Commission related to European education matters.

Please forward this newsletter to your colleagues and students. Please submit any relevant information for dissemination in the newsletter to aquatnet@aquatt.ie.

Contents

1. AQUA-TNET News

- [Your PhD thesis on the AQUA-TNET PhD portal](#)

Agenda

- [Event: 5th Global Conference on Oceans, Coasts and Islands, 3-7 May 2010, Paris \(France\)](#)
- [Event: 4th International Meeting of World Ocean Network, 9-12 May 2010, Boulogne sur Mer \(France\)](#)
- [Event: 9th International Congress on the Biology of Fish, 5-9 July 2010, Barcelona \(Spain\)](#)
- [Event: Second International Conference on Conservation and Management of the Balkan Freshwater Fishes \(COMBAFF\), 1-3 September 2010](#)

- Training: Vaccination of Early Life Cycle Stages of Fish, 7-8 April 2010, Copenhagen (Denmark)
- Course: Introduction to Bayesian inference in fishery science, 7-11 June 2010, ICES, Copenhagen (Denmark)
- Please check AquaTT Training News January 2010 for a complete overview of upcoming events, conferences and workshops

Research & Education

- LLP Call for Proposals 2010
- FP7: Open call for European Cooperation in the field of Scientific and Technical Research
- Publication: Adult Education outside of EU
- England and Wales: The Inquiry into the Future for Lifelong Learning
- Aquaculture training centres in France
- Call for papers: Second International Conference on Conservation and Management of the Balkan Freshwater Fishes (COMBAFF), 1- 3 September 2010, Gödöllő (Hungary)

Other

EU funds effective translation tool

- Commissioner designate for Research, Innovation and Science promises 'action and delivery' to MEPs
- "Slow fish" – a fast growing campaign to promote sustainable consumption

2. AquaTT Training News

3. Bibmail

4. Information of Interest

5. Pisces TT Jobs

6. Other

AQUA-TT TRAINING NEWS January 2010

A free e-mail news service provided by AquaTT on European Education & Training in Aquaculture. Please submit any relevant information for dissemination in the newsletter to news@aquatt.ie

Contents

1. Education

- Training course: Management Strategy Evaluation (including FLR), 5-9 April 2010, Vigo (Spain)
- Workshop: Vaccination of Early Life Cycle Stages of Fish, 7-8 April 2010, Copenhagen (Denmark)
- Phd course: "The Economics of Marine Resources: Ecological-Economic Modeling of the Marine Environment: Models and Management", 19-23 April 2010, Esbjerg (Denmark)
- Advanced course: New perspectives on marketing chains in small-scale fisheries and aquaculture, 26-30 April 2010, Zaragoza (Spain)
- Short course: Marine Taxonomy and Habitat Survey, 4-7 May 2010, Bournemouth University (United Kingdom)
- Short course: Freshwater Fish Ecology, 4-7 May 2010, Bournemouth University (United Kingdom)
- PhD course: Stated Preference/Choice Research, May 17-21, 2010 University of Southern Denmark, Esbjerg (Denmark)
- Short course: Introduction to Bayesian inference in fishery science, 7-11 June 2010, ICES Copenhagen (Denmark)
- Short course: Aquatic Invasive Species, 6-9 September 2010, Bournemouth University (United Kingdom)
- PhD course: "Strategic behaviour in fisheries: application of coalition games", 6-10 September 2010, Helsinki (Finland)
- Training course: "Opening the box: Stock assessment and fisheries advice for stakeholders, NGOs and policy-makers", 5-7 October 2010, ICES Copenhagen (Denmark)

2. Announcements

Due to the overwhelming amount of Events in the Maritime sector, AquaTT decided to provide you with a supplement to the AquaTT Training News, specifically for the Announcements. The Announcements supplement is sent out together with Training News. Please [CLICK HERE](#) to go to the archived Announcement Supplements. Please [CLICK HERE](#) for the AquaTT Calendar which gives you a comprehensive overview of all events in the sector.

3. Other

- [European Research by country search tool](#)
- [Mariculture: The SAMI Project findings](#)
- [FAO technical paper: Climate change implications for fisheries and aquaculture](#)
- [FAO technical paper: Environmental impact assessment and monitoring in aquaculture](#)
- [Call for Papers: International Seafood & Health Conference, 6-10 November 2010, Melbourne \(Australia\)](#)
- [Call for papers: Second International Conference on Conservation and Management of the Balkan Freshwater Fishes \(COMBAFF\), 1- 3 September 2010, Gödöllő \(Hungary\)](#)
- [New outreach video gallery on EurOcean website](#)
- [First EUROFLEETS newsletter](#)
- [EUROFISH magazine goes electronic](#)

4. PiscesTT Jobs

- [PiscesTT Jobs - Job vacancies, MSc & PhD positions and student placements in Aquaculture, Fisheries and Marine Sciences](#)

5. Student corner

- [European PhD conference in Food Science and Technology](#)
- [Student submissions to AquaTT Training News](#)
- [EAS-SG special offer for students](#)

PROMICROBE

MICROBES AS POSITIVE ACTORS FOR MORE SUSTAINABLE AQUACULTURE

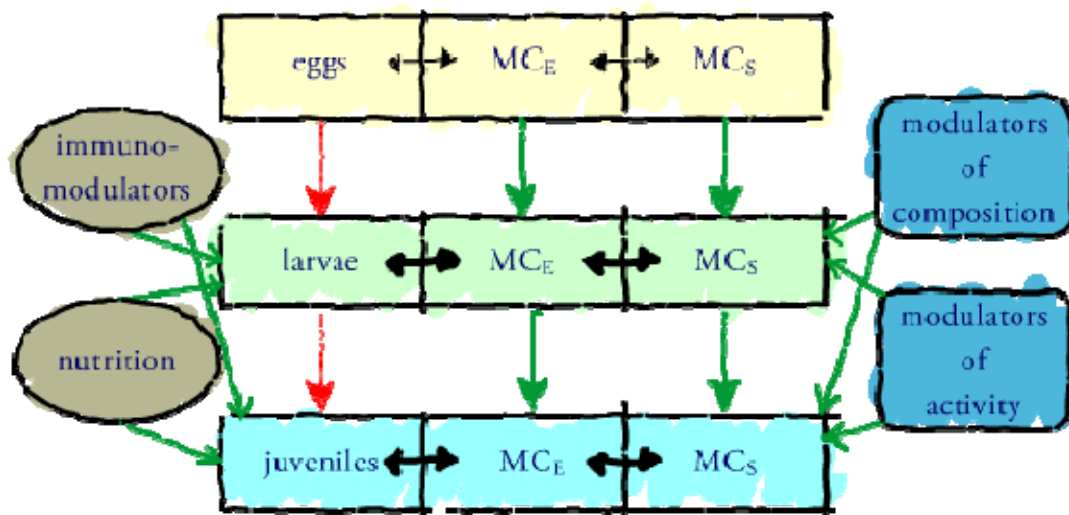
<http://www.promicrobe.ugent.be/>

Concept

The project starts from the concept that the host microbial community (MC) is influenced by the host itself and by the microbial community of the system in which the host is living. It is anticipated that there is a reciprocal interaction between the different compartments of the system in every stage of the life cycle.

The strength and the nature of those interactions can depend on the life cycle stage. Apart from these horizontal interactions, it is anticipated that microbial communities evolve as the host grows or the system changes. A certain degree of top-down conditioning belongs to the possibilities.

This would mean that the early colonisation of the host by certain micro-organisms, might condition the host response and determine the microbial community composition in later life stages. In addition the environment (e.g. temperature, feed, water quality, sanitation measurements) will determine to a great extent the composition and activity of the microbial communities in the different compartments. The environment can be modulated through the composition of the feed or through compounds that directly influence the activity of micro-organisms. On the other hand nutritional compounds or immunomodulators might have a direct influence on the host, modulating the microbial community of both host and system.



Every life stage carries its associated microbial community (MC_E : microbial community of the intestine or attached to outer surface as for instance for eggs). The MC_E is to an undefined degree in equilibrium with the MC of the system (MC_S). The host can influence the MC_E through its antimicrobial activities as determined by its immunological capacities in every life stage (horizontal arrows). Yet the MC_E is probably also in equilibrium or influenced by the microbial community of the system (MC_S). The composition and activities of microbial communities (MC_E or MC_S) can be modulated to a certain degree, influencing the host. The host can be influenced either by direct interference with its immune system or through nutrition, modulating indirectly the MC. Thick arrows in this scheme are the subject of research activities in this project.

Objectives

Aquaculture has developed very rapidly over the last 20 to 30 years. Surfacing problems have been solved mostly on an empirical basis. Considering the fact that aquatic organisms live in a matrix (namely the matrix water) that contains the feed as well as the excretion products, it can be anticipated that the environment must have a very strong influence on the microbial community composition, its activity and hence on the host.

In the past the aquaculture ecosystem (being considerable reduced in terms of complexity compared to natural ecosystems) and especially the microbial component has only to a limited degree been studied in a systematic way. However, such studies have been hampered by the lack of the appropriate tools.

This project suggests bringing together various European research groups that have contributed to some important methodological breakthroughs that can be used in the study of host/microbe interactions and can help to disentangle the complex interplay between the different components of the aquaculture ecosystem as depicted above. These breakthroughs are:

- The demonstration that the composition of the total MC characterized by culture independent techniques deviated tremendously from the composition based on conventional culture dependent techniques.
- The demonstration by both culture dependent and independent techniques that the MC composition at least in larvae, differ as much between individuals living in the same tank as the variation recorded between different rearing environments.
- The possibility to set up a gnotobiotic aquaculture food chain for (marine) larval fish
- The possibility to start feed (marine) larval fish with compound diets.
- The possibility to modulate intestinal microbiota with feed components, including probiotics and prebiotics.
- The demonstration that microbial quorum sensing mechanisms operate in vivo in aquatic organisms determining microbial in vivo activity.
- The possibility to apply the cDNA-AFLP technique to aquatic organisms, allowing for rapid gene expression analysis even in organisms with a poorly characterised genome.

These methodological breakthroughs supply this project with a head start, as they supply the tools (especially when they are applied in combination as established by this EU project proposal) to disentangle to a great extent the complex interactions as depicted in Fig. 1. The work packages (see also “overall work plan”) are directed to the systematic gathering of novel information in relation to the major elements depicted above. It is anticipated that this novel information will allow developing new concepts that will be translated into new or adapted protocols to rear aquaculture organisms in a biological stable and economical efficient way. Some of the major objectives that will be addressed experimentally are the following:

- How does the microbial community evolve as the host progresses through its life cycle?
- How stable is the microbial community in relation to perturbation caused by changes in environmental conditions and how resilient is the microbial community?
- What is the effect of micro-organisms on the host metabolism, its disease susceptibility and viability?
- Considering that some environmental factors (e.g. salinity, feed composition) have a major influence on the MC composition, to what degree is it possible to influence or steer the MC composition and activity?
- To what extent can microbes present in aquaculture rearing systems be (re-) used to retain organic wastes and nutrients, and thus reduce the impact on the environment?

Project Details & Acknowledgements

Project full title

"Microbes as positive actors for more sustainable aquaculture"

Acronym

PROMICROBE

Funding Body

- [European Commission - DG RTD](#)
- **Seventh Framework Programme:** Cooperation Work Programme
- **Theme 2:** Food, Agriculture and Fisheries, and Biotechnology
- **Call Identifier:** FP7-KBBE-2008-2B
- **Budget:** ca. 3 million €

Contact Person:

[Dr. Stamatis VARSAMOS](#)

DG RTD, Unit E4: Agriculture, Forests, Fisheries, Aquaculture
SDME 8/92
Square de Meus, 8
B 1050 Brussels
Belgium

<http://www.promicrobe.ugent.be/>

EVALUATION OF THE ANTIBACTERIAL ACTIVITY AND TOXICITY OF MYRCIARIA CAULIFLORIA METHANOLIC LEAF AND FRUIT EXTRACTS

S. Mohanty, I. Cock-2009

The Internet Journal of Microbiology 7(2)

Abstract:

Methanol extracts from *M. caulifloria* leaves and fruit were tested for antimicrobial activity and toxicity in vitro. *M. caulifloria* leaf extract inhibited the growth of 9 of the 14 bacteria tested (64%) whilst the fruit extract inhibited the growth of 11 of the 14 bacteria tested (79%). Both Gram-positive and Gram-negative bacterial growth were inhibited by *M. caulifloria* leaf and flower extracts. 7 of the 10 Gram-negative bacteria (70%) and 2 of the 4 Gram-positive bacteria (50%) tested had their growth inhibited by *M. caulifloria* leaf extract whereas the fruit extract inhibited 7 of the 10 Gram-negative bacteria (70%) and 100% of the Gram-positive bacteria tested. *M. caulifloria* leaf extract proved to be toxic in the *Artemia franciscana* bioassay with 24, 48 and 72h LC50's of 232.9 ± 36.3 µg/ml, 169.1 ± 11.5

$\mu\text{g/ml}$ and $128.1 \pm 5.6 \mu\text{g/ml}$ respectively, making it more toxic than Mevinphos (24, 48 and 72h LC50's $1346.0 \pm 78.2 \mu\text{g/ml}$, $505.3 \pm 37.7 \mu\text{g/ml}$, 103.9 ± 12.8) at all time points except 72h but less toxic than potassium dichromate (24, 48 and 72h LC50's $86.3 \pm 5.1 \mu\text{g/ml}$, $80.4 \pm 4.3 \mu\text{g/ml}$, 77.9 ± 4.9). *M. cauliflora* fruit extract was non-toxic in the *Artemia fransiscana* bioassay indicating its potential as an antibacterial agent for medicinal use.

(I.Cock@griffith.edu.au)

SWIMMING SPEED ALTERATION OF ARTEMIA SP. AND BRACHIONUS PLICATILIS AS A SUB-LETHAL BEHAVIOURAL END-POINT FOR ECOTOXICOLOGICAL SURVEYS

Francesca Garaventa, Chiara Gambardella, Alessio Di Fino, Massimiliano Pittore, Marco Faimali-2010
Journal Ecotoxicology 1573-3017 (Online)

Abstract:

In this study, we investigated the possibility to improve a new behavioural bioassay (Swimming Speed Alteration test—SSA test) using larvae of marine cyst-forming organisms: e.g. the brine shrimp *Artemia* sp. and the rotifer *Brachionus plicatilis*. Swimming speed was investigated as a behavioural end-point for application in ecotoxicology studies. A first experiment to analyse the linear swimming speed of the two organisms was performed to verify the applicability of the video-camera tracking system, here referred to as Swimming Behavioural Recorder (SBR). A second experiment was performed, exposing organisms to different toxic compounds (zinc pyrithione, Macrotrol® MT-200, and Eserine). Swimming speed alteration was analyzed together with mortality. The results of the first experiment indicate that SBR is a suitable tool to detect linear swimming speed of the two organisms, since the values have been obtained in accordance with other studies using the same organisms (3.05 mm s^{-1} for *Artemia* sp. and 0.62 mm s^{-1} for *B. plicatilis*). Toxicity test results clearly indicate that swimming speed of *Artemia* sp. and *B. plicatilis* is a valid behavioural end-point to detect stress at sub-lethal toxic substance concentrations. Indeed, alterations in swimming speed have been detected at toxic compound concentrations as low as less than 0.1–5% of their LC50 values. In conclusion, the SSA test with *B. plicatilis* and *Artemia* sp. can be a good behavioural integrated output for application in marine ecotoxicology and environmental monitoring programs.

(Institute of Marine Science, National Council of Researches (CNR), Via De Marini 6, 16149 Genoa, Italy; email of Francesca Garaventa: francesca.garaventa@ismar.cnr.it)

DETERMINATION OF METRONIDAZOLE IN ADULT ARTEMIA USING HIGH PERFORMANCE LIQUID CHROMATOGRAPHY

Sherry Cox, Matthew C. Allender, Jason Yarbrough

Journal of Liquid Chromatography & Related Technologies

<http://www.informaworld.com/smpp/title~content=t713597273>

(Departments of Comparative Medicine, College of Veterinary Medicine, University of Tennessee, Knoxville, TN b Small Animal Clinical Sciences, College of Veterinary Medicine, Knoxville, TN, USA)

MOLECULAR PATHWAYS DURING MARINE FISH EGG HYDRATION: THE ROLE OF AQUAPORINS

J. Cerdà-2010

Journal of Fish Biology 75(9): 2175 - 2196

Abstract:

The pre-ovulatory hydration of the oocyte of marine teleosts, a unique process among vertebrates that occurs concomitantly with meiosis resumption (oocyte maturation), is a critical process for the correct development and survival of the embryo. Increasing information is available on the molecular mechanisms that control oocyte maturation in fish, but the identification of the cellular processes involved in oocyte hydration has remained long ignored. During the past few years, a number of studies have identified the major inorganic and organic osmolytes that create a transient intra-oocytic osmotic potential for hydrating the oocytes, whereas water influx was believed to occur passively. Recent work,

however, has uncovered the role of a novel molecular water channel (aquaporin), designated aquaporin-1b (Aqp1b), which facilitates water permeation and resultant swelling of the oocyte. The Aqp1b belongs to a teleost-specific subfamily of water-selective aquaporins, similar to mammalian aquaporin-1 (AQP1) that has possibly evolved by duplication of a common ancestor and further neofunctionalization in oocytes of marine teleosts for water uptake. Strikingly, Aqp1b shows specific regulatory domains at the cytoplasmic tail, which are key to the vesicular trafficking and temporal insertion of Aqp1b in the oocyte plasma membrane during the phase of maximal hydration. These findings are revealing that the mechanism of oocyte hydration in marine teleosts is a highly regulated process based on the interplay between the generation of inorganic and organic osmolytes and the controlled insertion of Aqp1b in the oocyte surface. The discovery of Aqp1b in teleosts provides an important insight into the molecular basis of the production of viable eggs in marine fish.

(Laboratory of Institut de Recerca i Tecnologia Agroalimentàries (IRTA)-Institut de Ciències del Mar, Consejo Superior de Investigaciones Científicas (CSIC), Passeig marítim 37-49, 08003 Barcelona, Spain; joan.cerda@irta.cat)

POST-RELEASE PREDATION ON HATCHERY-REARED JAPANESE FLOUNDER *PARALICHTHYS OLIVACEUS* IN THE COAST OF FUKUSHIMA, JAPAN

T. Tomiyama, K. Ebe, G. Kawata, T. Fujii-2010

Journal of Fish Biology 75(10): 2629 - 2641

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Abstract:

To determine the predators of 100 mm total length hatchery-reared juvenile Japanese flounder *Paralichthys olivaceus*, fishes and crabs were collected using gillnets and a small trawl net off the coast of Fukushima Prefecture, Japan. Predation on juvenile *P. olivaceus* by older conspecifics, the snailfish *Liparis tanakai*, ocellate spot skate *Okamejei kenojei* and the swimming crab *Ovalipes punctatus*, was detected based on analogical observation and molecular techniques. These predators are nocturnal feeders except for *P. olivaceus*. *Liparis tanakai* with body sizes large enough to consume juveniles only appeared in winter, whereas the large *O. punctatus* was abundant in early summer and in late autumn. Such seasonal variation in predator abundance indicates that the release season can be optimized for reducing predation mortality.

(Fukushima Prefectural Fisheries Experimental Station, Iwaki, Fukushima 970-0316, Japan; email of Tomiyama Takeshi: tomiyama_takeshi_01@pref.fukushima.jp)

TAKING ACCOUNT OF FISH WELFARE: LESSONS FROM AQUACULTURE

F. A. Huntingford, S. Kadri-2010

Journal of Fish Biology 75(10): 2862 - 2867

Abstract:

This paper explores the possibility that lessons learned from aquaculture might contribute to current debate on welfare and fisheries. After looking briefly at the history of research interest in the welfare of farmed fishes, some implications of using different definitions of and approaches to the concept of welfare are discussed. Consideration is given to the way in which the aquaculture industry has responded to public concern about fish welfare and, for cases where these responses have been effective, why this might be the case. Finally, possible cross-over points between aquaculture and fisheries in the context of fish welfare, as well as experience and expertise that might be shared between these two areas, are identified.

(Fish Biology Group, Faculty of Biomedical & Life Sciences, University of Glasgow, Glasgow G12 8QQ, U.K.; email of T. Huntingford: f.huntingford@bio.gla.ac.uk)

COMPARISON BETWEEN MICROSURGERY AND TRADITIONAL EGG REMOVAL FROM STARRY STURGEON, *ACIPENSER STELLATUS*, BROODSTOCK

Ali Bani, Ashkan Banan-2010

Journal of the World Aquaculture Society 41(1): 144 - 148

Abstract:

Reuse of sturgeon broodstock for propagation could provide opportunity to ease fishing pressure on the wild stocks of these valued species. This study was carried out to evaluate the microsurgery procedure for egg removal from a sturgeon species, starry sturgeon, *Acipenser stellatus*, and to compare the result with the traditional procedure of egg removal from the abdomen of sacrificed fish. In comparison to the traditional procedure, microsurgery is rapid which can be performed between 5 and 17 min per fish. Rates of hatching using microsurgery (41%) and the traditional (43%) procedures were similar. Fish remained healthy 4 mo after microsurgery. Eggs obtained by microsurgery were only 10% less in volume than eggs obtained by traditional procedure. Although some eggs are lost in microsurgery, reuse of females as potential broodstock would easily compensate for the lower egg volume. It can be concluded that microsurgery is an appropriate procedure for collection of ovulated eggs from starry sturgeon.

(Fisheries Department, Faculty of Natural Resources, University of Guilan, POBox 1144, Sowmeh-sara, Iran)

DELAYED AND RESTRICTED EXPRESSION OF UAS-REGULATED GFP GENE IN EARLY TRANSGENIC ZEBRAFISH EMBRYOS BY USING THE GAL4/UAS SYSTEM

Huiqing Zhan, Zhiyuan Gong-2010

Marine Biotechnology 12(1): 1-7

Abstract:

A stable Tg(UAS:GFP) zebrafish line was generated and crossed with Tg(hsp70:GAL4) line, in which the GAL4 gene is under the control of an inducible zebrafish promoter derived from the heat shock 70 protein gene (hsp70). The dynamic green fluorescent protein (GFP) expression in early zebrafish embryos in the GAL4/UAS binary system was then investigated. We found that, at early developmental stages, expression of GFP effector gene was restricted and required a long recovery time to reach a detectable level. At later developmental stage (after 2 days postfertilization), GFP could be activated in multiple tissues in a shorter time, apparently due to a higher level of GAL4 messenger RNA induction. It appears that the type of tissues expressing GFP was dependent on whether they had been developed at the time of heat shock. Therefore, the delayed and restricted transgene expression should be taken into consideration when GAL4/UAS system is used to study transgene expression in early developmental stages.

(Department of Biological Sciences, National University of Singapore, Singapore, Singapore, 11754; email of Zhiyuan Gong: dbsgzy@nus.edu.sg)

THE SELECTIVITY OF MILKING OF DUNALIELLA SALINA

Dorinde M. M. Kleinegris, Marcel Janssen, Willem A. Brandenburg, René H. Wijffels-2010

Marine Biotechnology 12(1):14-23

Abstract:

The process of the simultaneous production and extraction of carotenoids, milking, of *Dunaliella salina* was studied. We would like to know the selectivity of this process. Could all the carotenoids produced be extracted? And would it be possible to vary the profile of the produced carotenoids and, consequently, influence the type of carotenoids extracted? By using three different *D. salina* strains and three different stress conditions, we varied the profiles of the carotenoids produced. Between *Dunaliella bardawil* and *D. salina* 19/18, no remarkable differences were seen in the extraction profiles, although *D. salina* 19/18 seemed to be better extractable. *D. salina* 19/25 was not “milkable” at all. The milking process could only be called selective for secondary carotenoids in case gentle mixing was used. In aerated flat-panel photobioreactors, extraction was much better, but selectiveness decreased and also chlorophyll and primary carotenoids were extracted. This was possibly related to cell damage due to shear stress.

(Agrotechnology and Food Science, Bioprocess Engineering Group, Wageningen University and Research Centre, P.O. Box 8129, 6700 EV Wageningen, The Netherlands; email of Dorinde M. M. Kleinegris: dorinde.kleinegris@wur.nl)

TECHNICAL NOTE

ORIGIN OF CHIRONOMID LARVAE IN PLASTIC-LINED CULTURE PONDS: AIRBORNE OR WATER SUPPLY?

Sarah E. Kaatz, Joseph E. Morris, James B. Rudacille, Richard D. Clayton-2010

North American Journal of Aquaculture 72(2)

Abstract:

Twelve 0.26-m³, shallow, plastic pools at an Iowa fish culture facility were used as mesocosms to determine the mode (airborne versus water supply) and rate of colonization by benthic chironomid larvae without the predation pressure of fingerling walleyes *Sander vitreus*. Chironomid larvae have particular importance in the culture of walleye fingerlings. Concurrent with walleye hatchery operations in nearby plastic-lined production ponds, pools were filled and then fertilized using the same protocols as the production ponds. A 2 × 2 factorial experimental design was used that included screened (1,000- μ m mesh over the top of the pools) and nonscreened pools and filtered (75- μ m-mesh sock) and nonfiltered water in the pools. Chironomid larvae were sampled twice during the 5-week culture season with Hester–Dendy samplers. At the end of the walleye culture season, there were no significant differences in chironomid density between filtered (108 larvae/m²) and nonfiltered (657 larvae/m²) pools, but nonscreened pools (592 larvae/m²) had larger densities of chironomid larvae than screened pools (174 larvae/m²). These results suggest that airborne movement and egg deposition by chironomid adults, rather than transfer of organisms from the water supply reservoir to the culture facility, constitute the primary method of chironomid colonization in plastic-lined ponds.

(Department of Natural Resource Ecology and Management, Iowa State University, 339 Science II, Ames, Iowa 50011, USA; email of J. Morris: jemorris@iastate.edu)

ASSESSMENT OF FORMALIN AND HYDROGEN PEROXIDE USE DURING EGG INCUBATION OF NORTH AMERICAN BURBOT

Mark P. Polinski, Nathan R. Jensen, Kenneth D. Cain, Keith A. Johnson, Susan C. Ireland-2010

North American Journal of Aquaculture Volume 72(2):111-117

Abstract:

Control of aquatic fungi in the family Saprolegniaceae during egg incubation was investigated as part of a program aimed at developing aquaculture methods for Kootenai River burbot *Lota lota maculosa*, a species relatively unknown to North American aquaculture. The concentration effectiveness of two antifungal control methods, formalin and hydrogen peroxide, was compared over two consecutive breeding seasons in a newly developed micro-incubation system. The results indicated that daily 15-min treatments of 1,667 mg of formalin/L and 500 mg of hydrogen peroxide/L inhibited fungal growth on eggs and increased egg survival by up to 200% during the incubation period relative to the untreated controls. Lower concentrations of 1,000 mg/L formalin and 250 mg/L hydrogen peroxide also yielded increased survival but were not sufficient to completely inhibit fungal growth on eggs. Concentrations up to 5,000 mg/L formalin and 500 mg/L hydrogen peroxide did not appear to negatively influence egg survival during any stage of development. Gross larval deformities observed 7 d after the first observed hatch were not significantly different between any antifungal treatment group and the untreated controls. Thus, to maximize egg survival and adequately control fungus during egg incubation for this species, a minimum of 1,667 mg/L formalin or 500 mg/L hydrogen peroxide is recommended.

(Department of Fish and Wildlife Resources, College of Natural Resources, University of Idaho, Box 1102, Moscow, Idaho 83844-1136, USA; email of K. Cain: kcain@uidaho.edu)

COMMUNICATION

SURFACE DISINFECTION AND REMOVAL OF ADHESIVENESS FROM RAINBOW SMELT EGGS

Abigail B. Walker, Daniel Ward, Kristin Duclos, Michael Peters, David L. Berlinsky-2010

North American Journal of Aquaculture 72(2): 158-163

Abstract:

The survival of rainbow smelt *Osmerus mordax* embryos was evaluated after treating fertilized eggs with tannic acid (150, 300, 600, or 1,200 mg/L) in suspension for 10 min to remove adhesiveness or treating them with calcium hypochlorite (25, 50, 75, or 100 mg/L), polyvinylpyrrolidone iodine (PVP-I; 25, 50, 75, or 100 mg/L), or hydrogen peroxide (H₂O₂; 500, 1,000, 1,500, or 2,000 µL/L) for 15 min to achieve surface disinfection. Nonlethal concentrations of egg disinfectants were also evaluated for their germicidal effects by culturing disinfected eggs in sterile Bacto Tryptic Soy Broth. The hatching success of the eggs treated with tannic acid (at all concentrations) was not different from that of the controls. Disinfecting eggs with H₂O₂ (all doses) and low doses of calcium hypochlorite (25–75 mg/L) or PVP-I (25 mg/L) did not reduce embryo survival, but exposure to calcium hypochlorite and PVP-I at higher concentrations (100 mg/L and 50, 75, or 100 mg/L, respectively) was lethal. In the first disinfection trial both H₂O₂ and PVP-I (25 mg/L) prevented bacterial growth, but only H₂O₂ at 2,000 µL/L did so in the second trial.

(Department of Biological Sciences, University of New Hampshire, Durham, New Hampshire 03824, USA; email of David Berlinsky: david.berlinsky@unh.edu)
