



2011 RIDLEY AQUA-FEED PRAWN & BARRAMUNDI CONFERENCE

3 - 5th August 2011
Dockside Conference Centre,
Cockle Bay Wharf on the city side of Darling Harbour
Sydney NSW

Enquiries - info@apfa.com.au

Speaker Biographies



AUSTRALIAN
**Prawn
Farmers**
ASSOCIATION



Richard Smullen

Aqua Feed Technical Manager

Dr Richard Smullen has been in the aquaculture industry for the last 15 years. After his PhD on Shrimp Broodstock Nutrition he was a post doctoral researcher and lecturer at The Institute of Aquaculture, Stirling University. After leaving the academic environment Richard worked for BioMar - the third largest fish feed manufacturer in the world, as the Technical and Product Development Manager. Since October 2003, Richard has been the Technical Manager at Ridley Aqua-Feeds.

Richard.Smullen@ridley.com.au



Dr. Matthew Briggs

Dr. Matthew Briggs is co-director of Vannamei 101 Co. Ltd, based in Phuket Thailand, involving consultancy, training, sales of livestock and products for *P. vannamei* farming throughout Asia, has been working in aquaculture for 27 years and has specialized in the culture of *P. vannamei* in both Latin America and Asia, and over the last 12 years. He has been involved in many projects from breeding, maturation and larval rearing to grow-out of this species, is experienced in managing commercial shrimp and fish farming operations in Ecuador, Indonesia, Thailand, India, Philippines, China and Vietnam - including breeding, maturation, hatchery and grow-out phases.

He obtained his masters and PhD degrees in shrimp culture and worked on staff at the Institute of Aquaculture in Stirling, Scotland for 11 years, a frequent lecturer and presenter on shrimp farming and has given numerous papers on shrimp culture at international conferences.

He has sales and marketing experience with a number of major companies including Epicore BioNetworks Inc., Liptosa S.A. Behn Meyer Co., Zeigler Bros. Inc., and Bayer.

He also consults for many private companies, as well as various international organizations such as the FAO, NACA, STREAM and CABI throughout Asia.

mattbriggs101@gmail.com

Grahame Turk

Mr Grahame Turk BEc, FAICD

Managing Director of Sydney Fish Market

Grahame Turk is the Managing Director of Sydney Fish Market.

Grahame led an industry consortium to privatise Sydney Fish Market (SFM) in 1994 and was founding Chairman of Sydney Fish Market Pty Ltd. He was appointed Managing Director in November 2000.

Grahame serves on several industry and Government advisory bodies and Boards including:

- NSW Seafood Industry Council (Chair)
- National Aquaculture Council
- NSW Seafood Industry Advisory Council
- Ministerial Advisory Council on Primary Industries Sciences
- Australian Seafood Co-Products

He holds a Bachelor of Economics degree from The University of Sydney and is a Fellow of the Australian Institute of Company Directors.



Ben Hale

ADPOWER

Ben Hale is the founder of Adpower, a traditional advertising agency that entered the digital arena in the early days of dial-up. In his garden shed are quaint trophies collected when he grew his hair long and called himself a "creative".

Consulting to large corporations and mentoring small business in strategy and communications, Ben is passionate about technology's ability to transform the way we work.

ben@adpower.com.au

Dr Patrick Hone

Executive Director

Patrick Hone has extensive knowledge of all sectors of the fishing industry. Over the last 12 years he has played a key role in the planning, management and funding of fisheries related research and development in Australia. He has a PhD in the development of aquaculture feed, and has been involved in the development of several significant aquaculture industry developments including Southern Bluefin Tuna, Pacific Oyster, abalone and mussel aquaculture.



Ted Loveday

Managing Director

Seafood Services Australia

Ted is Managing Director of Seafood Services Australia, a not-for-profit company established as the industry development arm of the Australian Government Fisheries Research and Development Corporation and the Australian seafood industry.

Ted has over 40 years' seafood industry experience including:

- 20 years commercial fishing
- 12 years as President and Chief Executive of the Queensland Commercial Fishermen's Organisation
- 10 years as a Director and 6 years as Deputy Chair of the Australian Seafood Industry Council
- 6 years as a Director and Deputy Chair of the FRDC Board
- 9 years as SSA Managing Director

Ted has held positions on numerous boards and committees, and has represented the seafood industry on several state and national bodies and in international industry and government forums.

Ted was awarded the inaugural Queensland Awards for Leadership and Outstanding Contributions to Primary Industries. Ted was also awarded the Australian Seafood Industry Icon Award and an Australian Government's Centennial Medal for his services to the seafood industry nationally.

Ted graduated as a Master of Environmental Management (Sustainable Development) with University of Queensland in 2001. He is a graduate of the Australia Rural Leadership program and served a three year term as Director on the Board of the Australian Rural Leadership Foundation (2002-2005).



Michael Heidenreich

DEEDI

Michael Heidenreich is the Senior Industry Development Officer - North and Central Queensland for the Department of Employment, Economic Development and Innovation (DEEDI) and leads an industry development team which focuses on bringing together specialist knowledge, networks and services to work with the aquaculture industry.

Michael is an extension officer with more than 10 years experience in extension and industry development for the aquaculture industry. He holds a Masters in Rural Systems Management from University of Queensland and a B.S. from Central Queensland University.



GARY W SANSOM, AM

EMPLOYMENT HISTORY

Employer: Self

Period of Employment: 1980 onwards

Position: In Partnership with my wife in a Contract (Inghams) Chicken Farm, Jimboomba, Queensland

Employer: Clairvaux College

Period of Employment: 1975 - 1980 1982-84

Position: Secondary School Teacher

Employer: Myers

Period of Employment: 1970 - 1975

Position: Group Training Manager

Employer: NSW Department of Education

Period of Employment: 1966 - 1970

Position: Secondary School Teacher



Professor Roger Stone

University Southern Queensland

The University of Southern Queensland (USQ) has appointed world renowned climatologist Professor Roger Stone as the University's Research Chair in Climatology and Water Resources and Director of the Australian Centre for Sustainable Catchments (ACSC).

'Roger is perhaps Australia's leading and best known climatologist,' USQ Deputy Vice-Chancellor Professor Graham Baker said.

Previously employed at the Department of Natural Resources and Water (DNR) in the Climate and Systems Technology Unit, Professor Stone has made major contributions in science and policy.

'He is an expert in climate science, global warming and effects on sustainability both here in Australia and internationally,' Professor Baker said.

'On many occasions he has been invited to give keynote addresses at such places as the Royal Society in London and the Asia Pacific Network for Global Change Research, and has a significant profile internationally.

'Professor Stone is also the Australian representative at the United Nations (UN) Commissions for Climatology and Agricultural meteorology.'

Commencing operations at USQ in October 2005, the ACSC was established to ensure the profitability and sustainability of water and catchment administration in Australia.

With water a significant issue, Professor Baker said that Professor Stone would play an important role at the ACSC developing water resources solutions.



Marty Phillips

MARLINKA BARRAMUNDI FARM

Marty Phillips is a Barramundi Producer from near Innisfail in Far North Queensland. The enterprise has been operating for nearly ten years. Current production has evolved to around 250 tonnes per year. Prior to developing aquaculture he grew bananas, paw paws and sugarcane on the family farm. He also worked in research and extension in the sugar industry. He is currently the President of the Australian Barramundi Farmers Association.



Alistair Dick

PACIFIC REEF FISHERIES

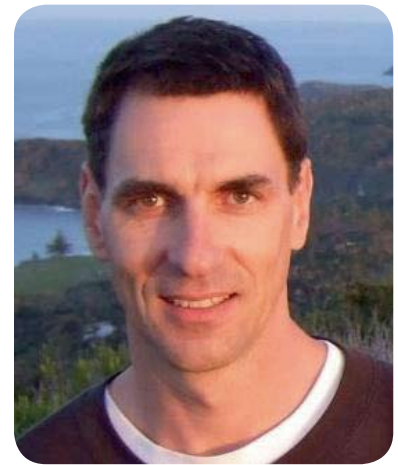
Alistair Dick is a prawn farmer and aquaculturist of 25 years having started out in fishing and pearl farming then moving onto prawn farming with Seafarm in 1988. Alistair is a graduate from both Central Queensland University and James Cook University and has degrees in both science and business, as well as having done some post grad studies at the University of Arizona in shrimp disease pathology and diagnostics. Alistair is now General Manager with Pacific Reef Fisheries and Vice President of our Association. Alistair is a regular presenter at APFA and other conferences. alistair.dick@pacificreef.com.au



Dr Alistair Hobday

Stream Leader - Climate Adaptation Flagship, Marine and Atmospheric Research
Commonwealth Scientific and Industrial Research Organisation (CSIRO)
Phone: (03) 6232 5310
Email: Alistair.Hobday@csiro.au

Dr Hobday is a Principal Research Scientist at CSIRO Marine and Atmospheric Research. His research spans a range of topics, including spatial management and migration of large pelagic species, environmental influences on marine species, and the impacts of climate change on marine resources. He leads the Marine Climate Impacts area within the CSIRO Climate Adaptation Flagship, and has been co-editor of two recent reports on the impacts of climate change on (1) fisheries and aquaculture, and (2) Australian marine life. He contributed to the development of the Marine National Adaptation Research Plan, co-leads the Biodiversity and Resources theme in the National Climate Change Adaptation Research Facility (NCCARF) Marine Network and is co-chair of the international Climate Impacts on Top Ocean Predators program. Adaptation options for prawn and barramundi farms in the face of climate change - advantages of seasonal forecasting



Alistair Hobday
CSIRO Climate Adaptation Flagship
Abstract

Knowledge about the future is extremely valuable for businesses. Businesses that are exposed to uncertainty in both the human (e.g. markets, demand, labour) and natural systems (e.g. environmental variation) may find future planning particularly challenging. The science of forecasting environmental conditions has advanced considerably in the past decade. Forecasts of future environmental information are now available for a range of time scales, including weather forecasts (up to 10 day outlooks), seasonal forecasts (up to six months ahead), and climate projections (up to 100 years or more ahead). Businesses that are able to use forecasts can move from a reactionary response-mode, into a strategic planning mode, with improvements in profitability expected following wise forecast use. Of particular interest to prawn and barramundi farmers are seasonal forecasts, which are used widely in terrestrial farming systems to plan crop timing, fertilization schedules, harvest periods, and rotation schedules. Recent development of forecast models that include marine variables (e.g. ocean temperature) have seen operational forecasting systems developed for marine fisheries (southern bluefin tuna), offshore cage aquaculture (Atlantic salmon) and biodiversity management (coral bleaching). Two strong environmental influences on prawn and barramundi farming that seasonal forecasting may help to manage are air (pond) temperature during the growing season and extreme events, such as cyclones. For many businesses, seasonal forecasting has the potential to reduce costs in bad years, and maximize profits in good years, however, the ability to make good strategic decisions varies with business experience and forecast accuracy. If you knew it was to be a warm year, could you increase profits or reduce costs? What would you do differently approaching a high risk cyclone season? Adapting business planning in response to seasonal forecasts may also help you consider and prepare for even longer term environmental projections associated with climate change.

Brian Cheshuk

DEEDI

Queensland Government policy: implications for aquaculture development

Brian Cheshuk

Department of Employment, Economic Development and Innovation

Recent government policies such as the Queensland Coastal Plan (QCP) and the Strategic Cropping Land (SCL) policy will have implications for future development of aquaculture in Queensland.

The objectives of the Queensland Coastal Plan are to protect coastal communities from threats such as storm tide surges and cyclones, to protect the coastline from development in high risk areas of coastal erosion and storm tide inundation, and to safeguard areas of high ecological significance from development.

The Strategic Cropping Land policy aims to find a balance among the agricultural, resource and development industries by assessing the potential impacts of development proposals on prime agricultural land. The Queensland Government's position is that strategic cropping land is a finite resource that must be conserved and managed for the long-term for growing food and fibre, and supports economic growth for regional communities. The intent of the SCL policy is to provide planning and approval powers to protect such land from developments that lead to its permanent alienation or diminished productivity.

The QCP and the SCL policy have implications for the growth and development of the Queensland aquaculture industry. Under the QCP, new aquaculture developments within the coastal zone must be located within designated "aquaculture development areas." Developments within SCL management areas will need to avoid and minimise, to the maximum extent possible, any impacts on identified strategic cropping land. Where this is not possible and strategic cropping land will be permanently alienated, the development proponent will be required to mitigate their impacts to ensure Queensland's agricultural cropping productive capacity is maintained.

Dr Nigel Preston

CSIRO

Dr Preston is the Leader of the CSIRO Food Futures Flagship Breed Engineering Theme, focused on developing animal breeds and nutrition to enhance Australia's livestock and aquaculture industries.

Dr Preston's research experience and interests include: marine biology, marine ecology, the environmental management of aquaculture and the development and application of advanced genetics and nutrition technologies to livestock and aquaculture industries. The multidisciplinary research teams that he has led have contributed to the economic and environmental sustainability of prawn farming industry in Australia and several other countries including Vietnam, Indonesia, Saudi Arabia, Mexico and Brazil. Nigel.Preston@csiro.au



Carl Paulo

DEEDI

Name: Carl Paulo

Position: Seafood Technician

Company: Innovative Food Technologies

Qld Department of Employment, Economic Development and Innovation

Bio: After graduating with a Masters in Biotechnology from the University of Queensland Carl took up a position as a seafood technician in the then named Queensland Department of Primary Industries and Fisheries. In the role for the past 4 years Carl has interacted with several industry and government bodies through various research projects aimed at post-harvest value-adding within various sectors of Queensland's seafood industry. Notable projects include: practices to maximise survivability of Mud Crabs through the supply chain, quality index manuals for several fish species, methods to mitigate muddy flavours in Barramundi, developing a rapid detection method for ciguatoxic fish, identifying factors contributing to undesired toughness in cooked Saddletail Snapper and the current prawn project looking at extending chilled storage and colour retention during frozen storage.



David Padula

SARDI

Name: David Padula

From: South Australian Research and Development Institute

Speaking Time: 11:10-11:30 AM, 4th August 2011

Presentation Title: Nutritional compositional profiles of Australian farmed Black Tiger Prawn (*Penaeus monodon*), Banana Prawn (*Fenneropenaeus merguensis*) and Barramundi (*Lates calcarifer*)

Biography: David is employed by the South Australian Research and Development Institute as a research scientist in the Food Safety Research Program. His principal research expertise includes international market access, residues in addition to public health nutritional aspects of Australian seafood. He is currently completing his PhD through the University of Tasmania.

David Padula - SARDI

Nutritional compositional profiles of Australian farmed Black Tiger Prawn (*Penaeus monodon*) and Banana Prawn (*Fenneropenaeus merguensis*) and Barramundi (*Lates calcarifer*)
David Padula¹

¹Food Safety Research Program, South Australian Research and Development Institute, GPO Box 397, Adelaide, South Australia 5001, Australia.

Abstract

As consumer awareness of nutrition increases, a greater interest in the public health attributes of seafood is being shown. A key to building the public awareness for specific Australian seafood species is making available nutritional information. However, little contemporary nutritional information exists for Australian seafood species, in part due to the sometimes unique species we have here. In some international markets nutritional labelling requirements have been introduced for seafood products. Countries such as Hong Kong recognise Food Standards Australia New Zealand nutritional definitions for back of pack labelling. Generic back of pack nutritional labels may be generated using electronic tools available from Food Standards Australia New Zealand.

In 2009 the South Australian Research and Development Institute began a project through the Australian Seafood CRC to generate standardised nutritional compositional profiles that would be internationally recognised for Australian Seafood CRC participants' products. Additional funding was provided by Food Standards Australia New Zealand. A national technical expert panel was established with membership including Food Standards Australia New Zealand, Flinders University and Seafood Services Australia. The panel assisted in the identification of nutrients of key common interest to all Seafood CRC participants, sample collection strategies, sample processing approaches, storage, laboratory procurement, data management and end user reporting.

A face to face consultation process with Seafood CRC participants was initially undertaken to identify nutritional components of interest to industry and existing data sets.

In excess of a hundred individual tests were performed on product samples provided by members of and the Australian Prawn Farmers Association and the Australian Barramundi Farmers Association. Testing included a wide range of nutritional components of labelling importance including fatty acids, proximate composition, vitamins, minerals and DNA species verification.

All laboratory results are currently being scrutinised and reviewed by the project team. Data will be hosted on the Seafood Services Australia website in a secure password protected area for access by relevant Seafood CRC participants



Bambang Julianto

GOLD COAST MARINE AQUACULTURE

Bambang Julianto, having started out in prawn farming since 1986 after leaving Diponegoro University, INDONESIA with a degree in Aquaculture. Working in the prawns industry in Indonesia and Asia with broad experience in hatchery, grow out and feed. In 2002 moved to prawn farming in Australia and a current employee at Gold Coast Marine Aquaculture Pty Ltd.



Dr Brian Paterson

DEEDI

Dr Brian Paterson is a principal research scientist based at DEEDI's Bribie Island Research Centre. His current focus is maturation of male prawns - for both current CRC projects male prawn fertility project and all-female prawn production. Brian moved from the Department's Centre for Food Technology in 2001 to guide the Department's response to Queensland's foray into crab farming. But at Bribie Brian is returning to his roots, having joined the then DPI some twenty years ago- for the original live kuruma prawn project. He has experience in the handling and transport of live seafood and physiology of prawns, lobsters, and crabs (and barramundi) as well as the effects of feeds, harvesting and handling practices on product characteristics in aquaculture such as colour and flavour.

Brian.Paterson@deedi.qld.gov.au

Dr Ryan Wilkinson

Dr Ryan Wilkinson completed his PhD at Flinders University and biotechnology company GroPep Ltd. in 2005. In 2006 he moved to Tasmania to commence the role of Lecturer - Aquatic Animal Endocrinology (University of Tasmania, Launceston). Throughout his time at UTAS, Dr Wilkinson has conducted undergraduate teaching, research training and research in general fish endocrinology and physiology, stress and welfare in aquatic animals, fish behaviour, fish nutrition, reproductive endocrinology, post-harvest flesh quality and photoperiod manipulation for improved aquaculture production. He has worked closely with barramundi, salmon, tuna and kingfish growers and Australian aquafeed companies.



Dr Mark Porter

Accounts & Business Development Manager
Ridley AgriProducts Pty Ltd
12-18 Neon Street,
Narangba QLD 4504
P +61 7 3817 9811 M +61 427 736 869
mark.porter@ridley.com.au
<http://www.agriproducts.com.au>

Biography:

Dr Porter is the Business Development Manager for Ridley Aquafeed. He moved to Ridley in 2006 from a position as lecturer at the University of Tasmania prior to which he was at the Institute of Aquaculture, Stirling, Scotland. His experience within the aquaculture industry spans over 24 years and has included working on commercial farms; for the Scottish Environmental Protection Agency; with the Fisheries and Wildlife service and Institute of Arctic Biology in Alaska; and working closely with salmon producers in Scotland, Norway, New Zealand, Australia and Chile investigating methods to reduce production and harvest stress and inhibit sexual maturation. Other interests include the development of new species such as European seabass, Atlantic cod, halibut, and more recently barramundi, tuna and kingfish through the transfer of technology from the salmon industry.



Dr Nick Wade

CSIRO.

Title: "Regulation and optimisation of prawn colouration: There is more to it than meets the eye."

Dr Nick Wade

CSIRO Food Futures Flagship, Ecosciences Precinct, Dutton Park, QLD 4102.

Nick.Wade@csiro.au

Executive Summary

Colour of cooked prawns is a major factor in consumer desirability and acceptability, with darker more consistently coloured prawns demanding premium market prices. An essential component to producing this colour is the dietary incorporation of the carotenoid astaxanthin, and carotenoid inclusion level and feed duration has been optimised for a number of species. However, considerable colour variation of the prawns at harvest exists both within ponds and across ponds, and total carotenoid content of prawn tissue alone does not correlate with cooked colour grade scores.

Our recent research has focussed on the beneficial effects of using dark substrates to enhance prawn colouration. By triggering the expansion of hypodermal chromatophores, pigment structures within the tissue beneath the shell of crustaceans, significant improvements in colour grade score can be achieved. Our latest research shows that there is another critical element to producing optimal prawn colour, a protein called crustacyanin. High abundance of this protein is essential to produce the highest colour grade scores. Results from our latest experiments and the implications for further optimising prawn colour will be presented.

Chelsey Parish

Seafood CRC

Factors contributing to the export propensity of Australian prawn firms

By Chelsey Parish

(Formerly of the University of the Sunshine Coast)

Australian Seafood Cooperative Research Centre

Email: Chelsey.parish@seafoodcrc.com

Mobile: 0400 837 639

Author Biography

Chelsey Parish completed her Honours degree in International Business at the University of the Sunshine Coast at the end of 2011. Chelsey is a fresh face in the seafood industry with experience in trade and market research in the Asia Pacific. After completing her research in the prawn industry, Chelsey has begun working for the Australian Seafood CRC as the communications and events officer, giving her wide exposure to all aspects of the seafood industry in Australia.

Paper Summary

Purpose: The purpose of this study is to understand what firm characteristics influence the export propensity of Australian prawn firms.

Methodology: The methodology employed for this study was the qualitative case study method. This method involved collecting qualitative data from managers of prawn firms. The data was used to explore four propositions relating to the export propensity of Australian prawn firms.

Findings: The data provides support for the propositions that a firm's management experience and commitment along with relationship and information capability influence export propensity. Indeed the level of export experience of managerial staff had the strongest level of influence on export propensity in the case study data.

Research limitations/implications: The results of this study cannot be generalised beyond the setting in which the data was collected due to the exploratory nature of this research. The author identifies that future research should examine export propensity of Australian firms in a broader sample of seafood and agricultural industries in both developed and developing countries, specifically in the Asia Pacific.



Peter Blyth

AQ1

Peter Blyth is currently a Director of AQ1 Systems Pty. Ltd, Australia. AQ1 Systems (est.1993) specializes in the development of optical and acoustic sensor based feeding control systems for the global aquaculture industry. Academic achievements include a BSc from James Cook University, 1981 and Master Degree from the University of Tasmania. I have worked in fisheries and aquaculture sectors in both research and commercial capacity with a major focus on feeding behaviour and aquaculture engineering of systems for cultured species. Species worked on include salmonids, kingfish, tuna's, bass, bream and shrimp both in the wild fishery and aquaculture context. Recent endeavours have focused on novel passive acoustic techniques to feed shrimp and barramundi.



Associate Professor Meredith Lawley

Currently, Meredith is an Associate Professor (Marketing) within the Faculty of Business at the University of the Sunshine Coast. She teaches Research Methods and Marketing Management at postgraduate level. Up until 2009, Meredith's key research interests were in services marketing, particularly the marketing of international education. Then came the Australian Seafood CRC. Meredith is now Theme Leader for Consumer Insights within the Sellfish section of the CRC. She is the Principal Investigator on 3 CRC projects and is a co-investigator on several other projects. As part of her role as Theme Leader she has input and gives advice on a range of CRC research projects involving consumer research.



Jen Savage

VICTORIAN RIRDC RURAL WOMENS AWARD 2011 RUNNER UP
ABSTRACT

Developing an aquaculture online "one stop shop"

Jennifer Savage of Savage Fish Pty Ltd

RIRDC Rural Women's Award and Australian Pork Limited are assisting in the development of an online whole of supply chain, one stop shop, to provide industry with all relevant information regarding production and management, industry standards, buyer requirements and legislative requirements, similar to APL's Pig Pass. The pass enables a basic level of knowledge regarding best practice guidelines to be passed on to people prior to engaging in the industry, and to those already within the industry. With the potential to be further developed into a Quality assurance model through the transfer and testing of knowledge regarding the 'best practice guidelines' for industry and their implementation within an organisation.

Email: savagefish@bigpond.com

Savage Fish Pty Ltd is on FACEBOOK! FIND US TODAY!

Dos O'Sullivan

DOSAQUA

Dos O'Sullivan has been working in the marine biology and seafood sectors for 30 years. This has taken him to every continent, including Antarctica and has involved working in fantastic places with amazing people. Milestones include establishing Austasia Aquaculture (the industry's leading trade magazine), founding member of Australian Aquaculture Forum (now National Aquaculture Council), co-writing the aquaculture section of the competency based Seafood Industry Training Package and winning the SA FarmBis Award of Merit for "Training for Indigenous People" in 2008. Dos publishes annual reports on the status of aquaculture in Australia and he is recognised as the major commentator on industry issues and trends. He also has diversified into third party certification, particularly environmental, HACCP/food safety, quality and OH&S.

Dr Paul Palmer

DEEDI

Dr Paul J Palmer is a Senior Research Scientist with the Queensland Department of Employment, Economic Development and Innovation (DEEDI). He has worked in the mariculture industry in Queensland since 1986, and since 2000 has helped lead DEEDI's aquaculture wastewater research activities. In 2005 he began research into integrated systems incorporating sand-worm beds for improved productivity and environmental management at mariculture farms. This novel sand-worm filtration system has recently been studied at three marine prawn and fish farms providing very encouraging results for wastewater remediation efficiencies and secondary crop production.



ABSTRACT

An overview of recent work with polychaete-assisted sand filters

Paul J Palmer

DEEDI, Bribie Island Research Centre

paul.palmer@deedi.qld.gov.au

Novel polychaete-assisted sand filter (PASF) technologies have been progressively developed over the last six years from small tub- and tank-based trials on research stations through to larger semi-commercial systems at operating prawn and fish farms. Work over the last three years has been conducted at farms in the Pumicestone and Burnett regions in southern Queensland. That work was at the largest scale application of the PASF system so far attempted and the results for both wastewater treatment and marine worm production have been the best so far demonstrated. Suspended solids, chlorophyll, total nitrogen and total phosphorus were all removed from wastewater at significant levels on a continuous basis, and worm production was similar to or greater than previous levels of 300-400 g per square metre. The practicalities of building large PASF systems to handle industrial volumes of wastewater were also addressed in this most recent work, and results suggest that this method could soon provide a viable, more effective and more productive alternative to settlement ponds in the treatment of pond-based mariculture wastewater.

Carolyn Smith- Keune

JAMES COOK UNIVERSITY

Carolyn Smith-Keune

Research Associate

Aquaculture Genetics Research Group

School of Marine and Tropical Biology

James Cook University

Townsville QLD 4811 Australia

email: carolyn.smith@jcu.edu.au

I completed an undergraduate degree in Marine Biology and Biochemistry (with Honours) from James Cook University (1997) and later a PhD within the Centre for Marine Studies at the University of Queensland (2005). Between my undergraduate degree and PhD I worked at the Australian Institute of Marine Science as a technical officer within the Aquaculture group where I developed genetic markers and undertook population genetic studies of pearl oysters. I have been working at James Cook University within the Aquaculture Genetics Group since late 2004 on various projects mostly involving genetic marker development and testing, parentage analysis, population genetics and genetic aspects of growth and thermal tolerance of barramundi. My current role is as a research fellow within the Aquaculture Genetics group where I am involved with a large barramundi centred project examining and modelling physiological differences between genetically divergent stocks of barramundi, my role in this project is to conduct a landscape genetics study of wild barramundi populations incorporating both environmental and genetic data to identify environmental drivers of population structure (if any) and to identify genetic markers which may indicate local adaptation of stocks.



Tim Cutler

FP MARINE RISKS LTD

FP Marine Risks is an independent specialist marine insurance broker providing aquaculture, marine cargo, hull, and liabilities solutions to clients worldwide. The company was established in 1994 and has offices in London, Hong Kong, Melbourne, Sydney, Taipei and Beijing.

We offer a comprehensive service to both onshore and offshore aquaculture companies, backed by extensive industry experience and insurance expertise. Our philosophy is to work closely with clients, offering technical understanding and flexibility in order to develop solutions tailored specifically for individual circumstances and budgets.

FP Marine Risks is a member of the Hong Kong Confederation of Insurance Brokers. The company is regulated by the Financial Services Authority in the United Kingdom, the Australian Securities and Investments Commission, the China Insurance Regulatory Commission, and the Ministry of Finance in Taiwan. Plus was the first insurance broker headquartered in Asia to receive full accreditation as a Lloyd's Broker.



Speaker - Tim Cutler - Assistant General Manager, Australia and New Zealand

Tim joined FP Marine Risks in 2008 having previously worked for Vero National Marine in both their Sydney and Brisbane offices. Tim's marine insurance experience over the last decade includes both technical claims and underwriting roles. Tim works closely with Peter Sandall in servicing the company's clients in Australia, New Zealand and the Pacific Islands.

Nick Robinson

NOFIMA

Genetic diversity in barramundi breeding stocks: Implications for the Selective Breeding Program

Nick Robinson^{1,2}, Shannon Loughnan² and Dean Jerry³

¹Nofima

²Flinders University and Australian Seafood CRC

³James Cook University

Genetic diversity is needed in populations to provide adaptability to environmental stresses (eg. disease resistance) and as the basic ingredient for evolution and genetic improvement. Genetic diversity can be lost or reduced because of founder effects, when a small number of individuals are sampled from a large population to start a new population, and due to inbreeding, when individuals in a population share common genetic information that has been inherited from common ancestors in the past. How we go about capturing genetic diversity for the barramundi breeding program will depend on existing patterns of genetic diversity in the wild populations, and the representation of the wild genetic diversity in existing hatchery broodfish. Of importance will also be how we manage the breeding program after it is established so that we limit the loss of genetic diversity.

We are using microsatellite markers in four ways to help us capture and maintain genetic diversity with the establishment of the selective breeding program for barramundi. First we are building a comprehensive map of genetic diversity for wild populations of barramundi. Second we are sampling and testing hatchery broodstock (potential contributors to the selective breeding program) so that we can determine what representation of the wild populations exists among hatchery broodfish and which wild populations we need to capture in order to fill gaps in the genetic diversity landscape. Thirdly, we will estimate the degree of co-ancestry within each wild and domesticated population (eg. using "marker estimated kingship" values) so that we can limit loss of alleles and inbreeding in initial generations of the breeding program by allocating animals to spawning groups with low co-ancestry. Finally, we will use marker tests to track pedigree relationships, and limit inbreeding, as the breeding program progresses.

In summary, our strategy for capturing and maintaining genetic diversity in the barramundi selective breeding program will allow us to achieve strong genetic improvement for key traits while maintaining the adaptability, tolerance and fitness of the fish to diverse and changing environmental conditions.

Associate Professor Dean Jerry

AMES COOK UNIVERSITY

DIFFERENTIATING BARRAMUNDI FROM SOUTH EAST ASIA AND AUSTRALIA: WHAT GOOD IS POPULATION GENETICS?

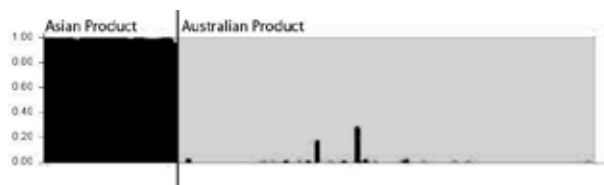
Carolyn Smith-Keune*, Eghy Pattinasarany, Graham Mair & Dean Jerry
Aquaculture Genetics Research Group, School of Marine and Tropical Biology
James Cook University, Townsville QLD 4814 Australia

There is significant interest in selective breeding of barramundi and identification of suitable founder populations of high genetic diversity is a priority not only in Australia but also overseas. Previous genetic studies have indicated genetic divergence between a limited number of Asian stocks (wild and cultured) and Australian stocks (cultured stocks only) with more limited genetic diversity reported for cultured populations in Australia. Placing diversity of cultured stocks into an appropriate context requires a good understanding of wild population stock structure and genetic diversity, yet much of *Lates calcarifer's* natural range has remained un-sampled and comparable information on the genetic diversity of wild stocks (potential founder populations) in each region is lacking. To address these issues we have instigated a large scale population genetic survey of wild barramundi stocks from throughout this species tropical range including fish sampled from India, SE Asia, central Indonesia, Papua New Guinea and Australia. Preliminary results from 7 polymorphic microsatellite loci indicated high levels of genetic differentiation between the Asian, central Indonesian and Australian stocks, as well as a reduced allelic diversity within wild Australian stocks compared to Asian wild stocks.

Following this population survey, and in response to new Australian 'Product of Origin' legislation, we have also evaluated the power of a multiplex suite of 9 microsatellite markers (Zhu et al 2006) to differentiate Australian and imported barramundi product. Barramundi fillets of varying Asian origin (Thailand, Taiwan and Vietnam) were purchased in the Australian market place and genotyped together with fish from four Australian reference populations. Due to high levels of population genetic differentiation, the imported (Asian derived) fillets (n = 30) could be unequivocally identified from Australian product (n = 108) using this genetic marker suite. Assignment certainties of imported products to the non-Australian genetic cluster were greater than 93% with a mean assignment certainty as high as 99% across the samples tested (Figure 1). These genetic markers are therefore suitable not only for population genetic studies, but are also useful as a genetic tool to test and enforce 'country of origin' labelling of barramundi product.

In the near future we are looking to complete the genetic picture by undertaking additional analysis with high resolution mitochondrial DNA markers applied to samples taken from throughout the species range and we are moving towards a much more comprehensive and detailed examination of genetic diversity and stock structure within Australia. The view now is to move away from a traditional population genetics approach using neutral microsatellite markers to a more sophisticated landscape genetics approach which will incorporate genetic markers (SNPs) that are present within genes that are known to be expressed at high/low temperatures and which are therefore potentially targets for natural selective forces. Such markers may show correlations with environmental parameters such as temperature extremes and can be good indicators for the presence of locally adapted stocks. The presence of locally adapted stocks, if detected, has important implications for breeding and restocking programs.

Figure 1: Structure analysis showing probability (y-axis) of individual fish (x-axis; n=138) belonging to one of two genetic clusters (K=2) with the Asian products to the left of the bar belonging to one genetic cluster (black) and the Australian fish belonging to a separate genetic cluster (grey).



Nathan Walker

Manager, Reef Guardians, GBRMPA

Nathan is leading on the development of the Reef Guardian Fishers program for the Great Barrier Reef Marine Park Authority.

Nathan has a background in fisheries research, management, and impacts on protected species. He has also spent a number of years considering the eco-certification of fisheries. He moved over from New Zealand in 2010 to join the Reef Guardians team at the Great Barrier Reef Marine Park Authority.

Nathan has recently been appointed as Manager of the Reef Guardians program to help the Director, Karen Vohland, ensure the success of the Reef Guardians concept.



Ben Jones

JAMES COOK UNIVERSITY

Ben Jones

Achieving economically sustainable barramundi aquaculture through improved fillet quality

The aim of this proposed project is to deliver practical solutions to common quality complaints within the Australian barramundi aquaculture industry that are impacting heavily on consumer sentiment and market demand. Product produced by aquaculture is often considered inferior to wild caught seafood due to a perception of inferior quality (Tucker, 2000). Issues of product colour, texture and freshness all impact on the perception of farmed fish (Lie, 2001) but the most important quality issue facing aquaculture is the perception of inferior flavour. Farmed product is often identified as being tainted by off-flavours (Tucker, 2000) or as being bland and flavourless (Whitfield et al., 1997). These quality issues impact heavily on the economic sustainability of many aquaculture sectors (Howgate, 2004). The aim of the proposed project is to deliver practical solutions to the problems of off-flavour tainting and bland/flavourless product in the Australian barramundi industry. This will be achieved through the development of techniques that aim to remove off-flavour tainting compounds from fish prior to harvest by the process of depuration. And by developing specially formulated finishing diets capable of increasing the bromophenol content of cultured barramundi to appropriate levels.



Brett Glencross

CSIRO

Dr Brett Glencross is the Stream Leader for Feed Technologies Research within the Food Futures Flagship at the CSIRO. He has Honours and Masters Degrees in Biochemistry from the University of Western Australia and a PhD in Aquaculture Nutrition from the University of Queensland. He is one of the editors of the Aquaculture Nutrition journal and also on the Scientific Committee of the International Society for Fish Nutrition and Feeding, the key professional organisation in that field. Over the past 15 years he has worked closely with major international aquaculture feed companies in Australia, Asia and Europe and also many aquaculture production companies in the fin-fish and prawn aquaculture sectors in both Australia and Asia. Adapting to climate change? - Using bioenergetic modelling to understand the implications of heat stress on barramundi growth, feed utilisation and optimal nutritional requirements

Brett Glencross CSIRO Marine and Atmospheric Research, PO Box 120, Cleveland, QLD 4163, Australia

Abstract: With prospective climate change occurring there is the potential for higher water temperatures to have a negative impact on barramundi (*Lates calcarifer*) production. Barramundi growth is known to peak at 29 to 32 °C and above this the animal begins to undergo thermal stress. Thermal stress has a range of symptoms including reduced growth, cataract formation, increased mortality and a range of sub-clinical changes that can be measured in the blood that exacerbate the higher temperatures go, before death occurs at around 38 to 40 °C. To examine potential nutritional management options for dealing with high water temperatures the implications of temperature on bioenergetics of barramundi were defined in an improved nutritional model. This model encompassed parameters accounting for effects over the temperature range of 16 °C to 39 °C and a size range of 10 g to 3000 g. A growth function describing weight gain by barramundi as a function of fish weight and temperature was derived from farm and laboratory data, and this function also included a term for a shift in optimal temperature with fish size. The maintenance energy and protein demands by barramundi were also defined and all three functions combined to form the basis of a bioenergetic factorial model to predict growth, energy and protein demand. Using this model optimal feed specifications were iteratively defined for a range of fish sizes at temperatures of 25 °C, 30 °C and 35 °C. A feed demand model was also developed based on the demand for digestible energy at each of these temperatures. The model suggested that at high temperatures (35 °C) there is an increase in the demand of dietary digestible protein relative to digestible energy and that with increasing size there is a decrease in the digestible protein to digestible energy demand. What this means at a formulation level is that diets with higher protein and lower lipid levels should support better growth at temperatures approaching thermal stress regimes. The model outputs were then tested in an empirical experiment to test the hypothesis of whether higher protein and lower fat can actually help improve performance during conditions of heat stress. Results of that experiment demonstrated that the higher protein, lower lipid strategy results in less growth loss under conditions of thermal stress, but the sub-clinical indicators still suggest that the animal is undergoing physiological challenges due to the high water temperatures.

Keywords : heat stress, bioenergetics, summer-diets

* E-mail: Brett.Glencross@csiro.au



Adam Body B.Sc., M.Sc.

Adam Body was educated in Sydney and Canberra and is married with three children. His qualifications are in Marine Biology with business interests in Aquaculture where he has been studying and working since 1980. He completed his first degree in 1976 (B.Sc. Marine Science, University of Sydney) and then worked in the Cook Islands in agriculture until 1980, when he returned to university to study marine zoology and aquaculture (M.Sc., University of N.S.W., 1984). In the early 80's he pioneered large scale hatchery techniques for marine shellfish in Australia. In 1984 he travelled extensively through Japan visiting aquaculture research facilities throughout Honshu, Kyushu and the Ryukyu Islands. He worked for a year as Invited Research Scientist at the Tungkang Marine Laboratory in Taiwan in 1986. In Australia, he has worked both as a project consultant and as a manager of commercial farms in the aquaculture industry in New South Wales, Queensland and Western Australia. He has worked as chief technical consultant for major aquaculture projects in Vietnam, Thailand and Indonesia where he planned, implemented and established operating prawn farms and hatcheries. He is currently Managing Director of BioManagement Systems Pty Ltd, Tamariki Holdings Pty Ltd and Benoa Nominees Pty Ltd. In 1992, he established distributorship for microbial biotechnology processes and products for aquaculture and waste water in Malaysia, Thailand, Indonesia and the Philippines. His expertise is in aquaculture technical and financial feasibility work, aquaculture project planning and implementation. He has extensive experience working with Government agencies in Australia and SE Asia. He currently owns and operates his own company's shrimp and barramundi farm in the Northern Territory as well as consulting to special projects.



Shannon Loughnan

FLINDERS UNIVERSITY

I graduated with honours in molecular biology from Deakin University in 2003. Since then I was employed in the molecular genetics field for the Department of Primary Industries Victoria, before commencing my PhD in 2010 in aquaculture genetics. My current research involves the capturing and maintaining of genetic diversity for the long term benefits of breeding programs in aquaculture. The contribution of broodstock to a trial group spawning event for the barramundi selective breeding program. Shannon Loughnan¹ (PhD candidate aquaculture genetics), Justin Forrester² and Nick Robinson¹. ¹Flinders University and Australian Seafood CRC ²Good Fortune Bay

Unequal parental contributions to group spawning events have previously been reported for barramundi and other species. If unchecked, unequal parental contribution could result in high levels of inbreeding and a loss of genetic

diversity. A trial barramundi spawn was conducted as part of the development of the barramundi selective breeding program. The objective of the trial was to determine how individual broodstock contributed to the spawn, and therefore whether it would be feasible to use group spawning for the breeding program. A selection of broodstock (12 females and 21 males) were conditioned and placed together in a 50,000 litre spawning tank at Good Fortune Bay (GFB). Spawning occurred over two nights and 460 one day post-hatch larvae were sampled for DNA testing. Individual female broodstock contribution was highest on the first night, with three individuals contributing over 10% including one that contributed approximately 44%. The number of contributing males was greatest on the second night, with six individuals contributing over 5% each and the greatest single contributor being 21%. The total count of half-sibling crosses was high over the entire spawning period, 53 crosses on the first night and 78 on the second. Whilst percentage contribution differed significantly, a more even contribution of crosses was experienced on the second night of spawning. Overall, only one broodstock individual was found not to have contributed at all to the group spawning event. Current work is following the batches of progeny from each night to investigate for the effects of grading on the success of contribution. Further details on the results of the spawning trial will be presented and implications discussed. In conclusion, the results so far suggest that if the barramundi selective breeding program used group spawning in numerous tanks at the GFB facility, an adequate number of families could be produced. In addition, the analysis of DNA samples from a few hundred of the best performing progeny would allow us to make selection and tank allocation decisions that restrict inbreeding and provide strong genetic improvement.





AUSTRALIAN
**Prawn
Farmers**
ASSOCIATION



2011 RIDLEY AQUA-FEED
PRAWN & BARRAMUNDI
CONFERENCE