

# FINAL REPORT (DEVELOPMENT AWARD)

## AWARD CODE and TITLE

2009/315.23 People development program: Aquatic animal health training scheme - Visiting Expert Dr Teruo Miyazaki

**AWARD RECIPIENT:** Dr Teruo Miyazaki

**ADDRESS:** Graduate School of Bioresources, Dep. Lifescience, Mie University, Mie, JAPAN

**HOST ORGANISATION:** University of Sydney

**DATE:** 30<sup>th</sup> June 2013

## ACTIVITY UNDERTAKEN

A series of workshops were conducted for fish pathologists and visits of laboratories and institutions in New South Wales, Victoria, Tasmania, South Australia, Western Australia, Northern Territory and Queensland were undertaken with the purpose of knowledge exchange on aquatic animal pathology. In addition there was a public lecture on fish pathology.

## OUTCOMES ACHIEVED TO DATE

All workshops were well attended, providing a unique opportunity for formal and informal knowledge exchange. As a result fish pathologists in Australia have a better understanding of disease investigation, differential diagnosis and reaching the correct diagnosis.

## Acknowledgments

The support, organisation of itinerary and the encouragement provided by local hosts at each node of my visit is gratefully acknowledged, in particular:

- Professor Richard Whittington  
Chair of Farm Animal Health  
University of Sydney  
425 Werombi Road  
CAMDEN NSW 2570
- Ms Marion Saddington  
Administrative Assistant  
Farm Animal Health  
University of Sydney  
425 Werombi Road  
CAMDEN NSW 2570
- Dr Tracey Bradley  
Principal Veterinary Officer – Aquatic Animal Health  
Chief Veterinary Officer's Unit  
Department of Primary Industry  
475 Mickelham Rd  
ATTWOOD VIC 3049

- Professor Barbara Nowak  
Professor, Aquaculture  
University of Tasmania  
Science Building  
Old School Rd  
NEWNHAM TAS 7248
- Dr Charles Caraguel  
Lecturer, School of Animal & Veterinary Sciences  
The University of Adelaide  
Roseworthy Campus  
ROSEWORTHY SA 5371
- Dr Susan Kueh  
Lecturer in Pathology  
School of Veterinary & Life Sciences  
Murdoch University  
90 South St  
MURDOCH WA 6150
- Dr Kitman Dyrting  
Veterinary Pathologist  
Department of Primary Industry and Fisheries  
Berrimah Veterinary Laboratories  
BVL Building  
BERRIMAH FARM NT 0810
- Dr Roger Chong  
Principal Veterinary Officer (Aquatic Animal Biosecurity)  
Biosecurity Queensland  
Department of Agriculture, Fisheries and Forestry  
Biosecurity Sciences Laboratory, Block 12,  
Health & Food Sciences Precinct,  
39 Kessels Rd  
COOPERS PLAINS QLD 4108

## **Background**

This professional development activity was developed in discussion with Professor Whittington at the FRDC Aquatic Animal Health conference in Cairns in 2011. Professor Whittington consulted with Aquatic Animal Health professionals in NSW, VIC, TAS, SA, WA, NT and QLD to confirm their support for this knowledge exchange and training visit to Australia. The visit provided a unique opportunity for exchange of technical information pertaining to the diagnosis of internationally significant viral diseases and other diseases of finfish, molluscs and crustaceans, and for specific instruction of Australian laboratory diagnosticians.

## **Need**

Viral diseases are among the most important of all health issues in aquaculture and fisheries. Their rapid and accurate recognition is central to the prevention of spread and the control of emerging diseases. Morphological diagnosis based on gross pathology, histopathology and electron microscopy remain vital in the diagnostic process, and are essential to complement accurate molecular aetiological diagnosis. Practitioners of morphological diagnosis are becoming scarce, and this project enabled knowledge transfer from one of the world's foremost experts, Dr Teruo

Miyazaki from Japan. This knowledge transfer requires a hand-on approach in a small group setting, using a multi-headed microscope with plenty of opportunity for discussion. For this reason a face-to-face visit was essential. Improving aquatic animal health diagnostic capacity is a priority for FRDC specifically to prevent and manage disease incursions, and to develop diagnostic procedures and techniques to rapidly detect and identify pathogens. This is also a priority for state jurisdictions. In addition to viral diseases, Dr Miyazaki has career long expertise in general fish, mollusc and crustacean pathology, so his visit presented diverse opportunities for continuing education of Australian aquatic animal health diagnosticians.

### **Objectives**

1. Facilitate the visit to Australia of Dr Teruo Miyazaki for knowledge transfer to aquatic animal disease diagnosticians and industry

### **Methods**

The visit consisted of travel to each state to conduct a formal training workshop, and to engage in informal discussions. Each workshop consisted of a day-long meeting, with opportunity for viewing glass slides on a multi-headed microscope and/or powerpoint presentations of relevant pathology. Although a formal agenda was set up for each workshop, there was opportunity in the afternoon session for selection of case material based on the interests of those present. Light microscopy was complemented by gross pathology and ultrastructure. The diagnosis of key diseases was compared and contrasted. In addition to the workshops, Dr Miyazaki presented one public lecture in Tasmania, and engaged in numerous informal discussions with graduate students, pathologists and others during the segments of his itinerary that allowed for this. In summary the technical visit comprised:

1. Dr Miyazaki: travel to Australia from Japan
2. Small group workshop - Sydney, NSW
3. Small group workshop - Melbourne, VIC
4. Small group workshop - Launceston, TAS
5. Small group workshop - Adelaide, SA
6. Small group workshop - Perth, WA
7. Small group workshop - Darwin, NT
8. Small group workshop - Brisbane, QLD
9. Dr Miyazaki: travel to Japan from Australia

### **Results/Discussion**

The itinerary for the technical tour and workshop is provided as Appendix 1. A typical agenda for a workshop is provided as Appendix 2. Over 140 people met with and learned about aquatic animal pathology from Dr Miyazaki during his visit. These comprised 23 post graduate students, 20 undergraduate aquaculture students, 30 pathologists, 38 aquatic animal health professionals, 2 industry representatives and 30 members of the general public who attended a public lecture given by Dr Miyazaki in Launceston. A summary of the attendees for each location is provided as Appendix 3.

Feedback from participants at each workshop was very favourable. It is certain that knowledge was exchanged and that a large number of professionals in Australia have been made aware of the best methods for differential diagnosis and

confirmation of aetiology of a wide range of diseases of aquatic animals. Case studies were of international significance, as well as covering some of regional interest.

Several photographs from the visit are provided in Appendix 4, to show its formal and informal nature.

### **Benefits and Adoption**

Beneficiaries of this project are aquatic animal health diagnosticians throughout Australia, and through their work, the aquaculture and fisheries sectors throughout Australia. The visit has enhanced diagnostic capacity, enabling more rapid and accurate diagnosis of finfish diseases, which facilitates disease prevention and control and greater industry awareness of aquatic animal health. This project supports the general practice of diagnosis and so is relevant to most aquatic animal health diagnostic projects that have been funded by FRDC. Improved industry awareness of international linkages and the importance of aquatic animal health expertise should be apparent, given the success of the Japanese in aquaculture.

### **Further Development**

It is recommended that activities of this kind be continued into the future. It was relatively cost efficient to bring an expert to Australia and to have him travel to each node in the country to provide an educational exchange in an informal small group setting.

### **Appendices**

- Appendix 1. Itinerary Dr Teruo Miyazaki
- Appendix 2. Typical workshop agenda
- Appendix 3. Summary of attendees at aquatic animal pathology workshops conducted by Dr Teruo Miyazaki at each location
- Appendix 4. Images from the visit of Dr Teruo Miyazaki

## Appendix 1. Itinerary Dr Teruo Miyazaki

May 2013

Dates	Local contact	Activity	Workshop	Accomm (No. nights at destination)
Mon 29 <sup>th</sup> April	Richard Whittington	Travel to Sydney JQ16 Dep Kansai 20.25 pm		
Tues 30 <sup>th</sup> April		JQ16 from Cairns Arrive Syd 11.15 am Visit to main campus - University of Sydney University of Sydney Camden	Sydney	Camden (4) Crown Hotel 187 Argyle St Ph: 02 4655 2200
Wed 1 <sup>st</sup> & Thurs 2 <sup>nd</sup> May Fri 3 <sup>rd</sup> May		Workshop Camden		
Sat 4 <sup>th</sup> May		Travel to Melbourne - QF431 Departs 12 noon - Arrives 1.35pm Rest day Melbourne		Melbourne (3) Travelodge Southbank 03 8696 9600
Sun 5 <sup>th</sup> May Mon 6 <sup>th</sup> May	Tracey Bradley	Workshop	Melbourne	
Tue 7 <sup>th</sup> May	Barbara Nowak	Travel to Launceston – QF2283 Departs 11.50am - Arrives 1.00pm Launceston		Launceston (4) Hotel Grand Chancellor 29 Cameron St Ph: 03 6334 3434
Wed 8 <sup>th</sup> May Thur 9 <sup>th</sup> May Fri 10 <sup>th</sup> May		Workshop Launceston	Launceston	
Sat 11 <sup>th</sup> May	Charles Caraguel	Travel to Adelaide via Melb – QF2282 Departs Launceston 10.25am – Arrives Melbourne 11.35am QF685 Departs Melbourne 2.05pm – Arrives Adelaide 2.55pm Adelaide		Adelaide (4) Majestic Roof Garden Hotel 55 Frome St Ph: 08 8100 4400
Sun 12 <sup>th</sup> & Mon 13 <sup>th</sup> May Tue 14 <sup>th</sup> May		Workshop	Adelaide	
Wed 15 <sup>th</sup> May	Susan Kueh	Travel to Perth – QF587 Departs 11.30am - Arrives 1.20pm Perth		Perth (3) Travelodge Perth 417 Hay St Ph: 08 9238 1888
Thu 16 <sup>th</sup> May Fri 17 <sup>th</sup> May		Workshop	Perth	
Sat 18 <sup>th</sup> May	Kitman Dyrting	Travel to Darwin – QF792 Departs 8.30am - Arrives 1.30pm Darwin		Darwin (3) Mantra Pandanas 43 Knuckey St 08 8901 2900
Sun 19 <sup>th</sup> May Mon 20 <sup>th</sup> May		Workshop	Darwin	
Tues 21 <sup>st</sup> May Wed 22 <sup>nd</sup> May	Roger Chong	Travel to Brisbane – QF825 Departs 1.55pm - Arrives 6.00pm Workshop	Brisbane	Brisbane (2) Comfort Inn Suites Robertson Gardens 281 Kessels Rd NATHAN Ph: 07 3875 1999
Thu 23 <sup>rd</sup> May	Richard Whittington	Travel to Sydney – QF529 Departs 1.25pm - Arrives 3.00pm	Sydney	Sydney Airport Hotel (1) Stamford Plaza Cnr Robey & O’Riordan Sts MASCOT Ph: 02 9317 2200
Fri 24 <sup>th</sup> May		JQ952 Sydney to Cairns 06.00 am JQ15 Cairns to Kansai dep 12.20pm		

## Appendix 2. Typical workshop agenda

### FRDC Regional Workshops on Pathology of Aquatic Animals

Presented by Dr Teruo Miyazaki, Mie University, Japan

Dr Teruo Miyazaki is Professor Emeritus in the Graduate School of Bioresources, Mie University, Japan. His extraordinary career spans 40 years of active engagement in aquatic animal health. He is the author of several textbooks including the highly regarded "Color Atlas of Fish Histopathology" (Vols 1 and 2) and numerous scientific papers. A more detailed CV is provided after this agenda.

8.45 am Welcome and introduction of Dr Miyazaki (chairperson)

9.00- 9.45 Lecture 1. Chasing the true pathogen - investigating the aetiology of new and emerging diseases in finfish:

- Re-emerging ulcer disease of koi,
- Goldfish sleepy disease,
- Koi sleepy disease,

9.45 - 10.30 Lecture 2. Disease investigations and pathology of shrimp and mollusks:

- Pearl oyster mass mortality,
- Taura syndrome of vannamei shrimp,
- WSS in kuruma prawn

10.30 - 11.00 Morning tea and coffee

11.00 - 11.45 Lecture 3. Newly emerging and exotic diseases, highlighting the role of electron microscopy in the investigation of aquatic animal health, to reveals the nature of viruses

- Alloherpesviruses,
- IgY-immunization for Goldfish hematopoietic necrosis with CyHV-2,
- Megalocytivirus disease

11.45 - 12.30 Lecture 4. Newly emerging nutritional and metabolic diseases of finfish

- Methemoglobinemia,
- Melamine-induced nephropathy,
- Nutritional myopathy syndrome in cultured fishes

12.30 - 1.30 Lunch

1.30 - 3.30 Practical - look at glass slides or powerpoint slides

3.30 - 4.00 Afternoon tea

4.00-4.45 Lecture 5. Special topics of mutual interest to be decided in discussion with local organizers prior to the workshop

4.45 - 5.00 Closing comments (chairperson)

## **2012-2013 FRDC Visiting Expert Bursary – Dr Teruo Miyazaki**

Improving aquatic animal health diagnostic capacity is a priority for FRDC specifically to prevent and manage disease incursions, and to develop diagnostic procedures and techniques to rapidly detect and identify pathogens. This is also a priority for state jurisdictions.

Viral diseases are among the most important of all health issues in aquaculture and fisheries. Their rapid and accurate recognition is central to the prevention of spread and the control of emerging diseases. Morphological diagnosis based on gross pathology, histopathology and electron microscopy is vital in the diagnostic process, and is essential to complement accurate molecular aetiological diagnosis. However, practitioners of morphological diagnosis are becoming scarce.

The FRDC Visiting Expert Bursary awarded to Dr Teruo Miyazaki from Japan enables knowledge transfer from one of the world's foremost experts, in a small group setting, with plenty of opportunity for discussion. In addition to viral diseases, Dr Miyazaki has career long expertise in general fish pathology, so his visit presents diverse opportunities for continuing education of Australian aquatic animal health diagnosticians. Molluscs and crustaceans will also be covered at the workshops.

Beneficiaries include aquatic animal health diagnostic laboratories throughout Australia and the potential impact is enhanced diagnostic capacity, enabling more rapid and accurate diagnosis of finfish diseases, which facilitates disease prevention and control, and greater industry awareness of aquatic animal health. The visit provides a unique opportunity for exchange of technical information pertaining to the diagnosis of internationally significant diseases of aquatic animals, and for specific instruction of Australian laboratory diagnosticians.

Dr Teruo Miyazaki is Professor Emeritus in the Graduate School of Bioresources, Mie University, Japan. He has an extraordinary career history spanning 40 years of active engagement in aquatic animal health. He is the author of several textbooks including the highly regarded "Color Atlas of Fish Histopathology" (Vols 1 and 2) and numerous scientific papers.

**Appendix 3. Summary of attendees at aquatic animal pathology workshops conducted by Dr Teruo Miyazaki at each location**

<b>Location</b>	<b>Post graduate students</b>	<b>Under graduate students</b>	<b>Fish and other pathologists</b>	<b>Other aquatic animal health professionals</b>	<b>Industry and public</b>
<b>Sydney</b>	<b>4</b>	<b>20</b>	<b>10</b>	<b>6</b>	
<b>Melbourne</b>	<b>2</b>		<b>5</b>	<b>18</b>	
<b>Launceston</b>	<b>11</b>		<b>4</b>		<b>1</b>
<b>Public lecture*</b>					<b>30</b>
<b>Adelaide</b>	<b>2</b>		<b>2</b>	<b>1</b>	
<b>Perth</b>	<b>4</b>		<b>2</b>	<b>9</b>	
<b>Darwin</b>			<b>3</b>	<b>4</b>	<b>1</b>
<b>Brisbane</b>			<b>4</b>		
<b>Totals</b>	<b>23</b>	<b>20</b>	<b>30</b>	<b>38</b>	<b>32</b>

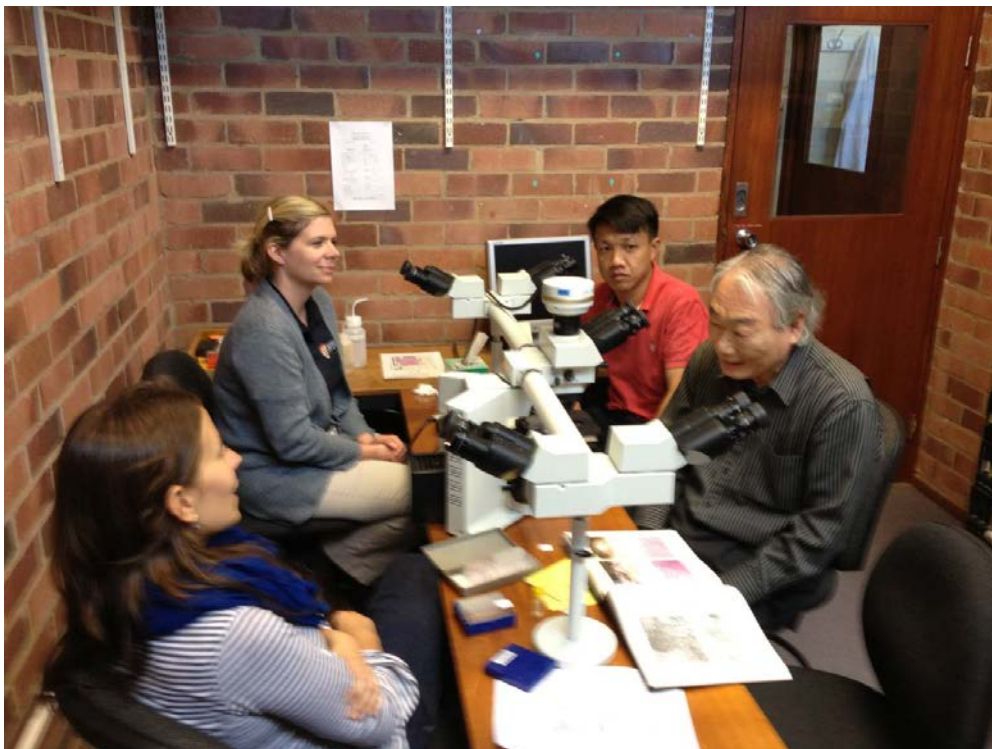
\* Held in Launceston



#### Appendix 4. Images from the visit of Dr Teruo Miyazaki



Dr Teruo Miyazaki enjoying a relaxing visit to Sydney Aquarium with aquatic animal health PhD students Jeffrey Go and Olivia Evans and Post Doctoral Research Fellow Dr Ika Paul-Pont



Dr Teruo Miyazaki explains the link between ultrastructural pathology and light microscopic lesions to aquatic animal health PhD students Diana Jaramillo and Jeffrey Go and Senior Lecturer Dr Joy Becker at the University of Sydney.