



## From the President's Desk

### Dear Members,

Welcome to the April edition of the ASP Newsletter. I wish those members who have been occupied with applications for NHMRC or ARC research support or people support success with their applications, and hope that everyone is enjoying getting back to real science!

Registration is still open for the 2013 ASP Conference which is being held in conjunction with the 24th International Conference of the World Association for the Advancement of Veterinary Parasitology (WAAVP) in Perth from 25-29th August 2013 (see <http://www.waavp2013perth.com>). This conference will cover a wide variety of topics spanning unicellular and multicellular parasites and including parasites of medical, veterinary, wildlife or marine importance. It will highlight themes, concepts and problems that bridge the gaps between human, animal, fish and other parasites and features an excellent line-up of international and national speakers. Two workshops will be run in conjunction with this meeting, on *Wildlife Parasites and Bioinformatics and Phylogeny*, to be held at Murdoch University on Sunday August 25th, just before the conference starts. Workshops for Early Career Researchers and research students will also be conducted during the conference. Students can apply for an ASP Student Conference Travel Grant to support their attendance. Early-bird registration for the conference has been extended to 17th May and 2013 ASP Student Conference Travel Grant Applications (<https://www.surveymonkey.com/s/2013ASP>) close on 24th May.

Upcoming closing dates to be noted for other 2013 Awards are 17th May 2013 for OzEMalaR Travel Awards and 26th July 2013 for ASP Network Researcher Exchange, Travel and Training Award and



JD Smyth Awards.

A reminder that next year we will be celebrating the 50th year anniversary of ASP, and all members are encouraged to contact Chris Peatey, head of the "Anniversary Celebration Working Group" or Lisa Jones with any ideas you may have to celebrate this occasion.

The Mid Term Meeting of Council was held on 28th February 2013, in Brisbane. Minutes of this meeting are available on the Wild Apricot site. Particularly notable were the reports by State representatives on State Outreach Activities. It appears that the initiative approved by Council in 2012 to provide a set amount of funds for each State/Territory of \$2,000/calendar year (up to \$500/event) to support ASP Outreach events has been successful. Members are reminded that these funds are very flexible and can be used for a wide range of events; all applications should be coordinated with your State/Territory representative. Remember that ASP is your Society so please take advantage of it!

Council also reviewed the results of the member survey about the proposed ASP Parasitology Course which was circulated after the 2012 AGM. The response rate for this survey was 24.4% of active members,

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## Researcher Exchange Report

**Alexander Brazenor, PhD student from James Cook University, Townsville won an ASP Network for Parasitology Travel Award for a Researcher Exchange to visit Dr Terry Bertozzi at the South Australian Museum and Associate Professor Ian Whittington at The University of Adelaide and the South Australian Museum. Alexander reports here on his very successful Researcher Exchange.**

Flatworms of the genus *Neobenedenia* (Monogenea: Platyhelminthes) are recognised as serious and virulent parasites of tropical and subtropical marine finfishes. *Neobenedenia* spp. have been linked to a number of epizootic outbreaks in wild and farmed fishes. Understanding the host specificity of species within *Neobenedenia* is crucial to being able to predict and manage future outbreaks. Little is known about which species of *Neobenedenia* infect fish in Australian waters. The absence of distinguishing morphological characters between isolates hinders the ability to distinguish between species based on morphological examination (Whittington, 2004). As such, the aims of this exchange trip to Adelaide University were to determine how many species of *Neobenedenia*, pathogenic or otherwise, there are in tropical north Australia and which fish they parasitize. Investigation into the genetic relationships within and between *Neobenedenia* species will aid in distinguishing species that cause disease and epizootic events from those that do not. This will be crucial in being able to manage these parasites in aquaculture and aquaria.

I travelled to the University of Adelaide/South Australian Museum between the 1st and the 29th of March, 2013 in order to work on the population genetics of *Neobenedenia* isolates from wild and farmed fish. As part of this trip to Adelaide University, I took *Neobenedenia* isolates from 11 wild and 12 captive fish host species from a variety of locations across northern Australia and sequenced two nuclear genes, histone H3 and 28S, for five fluke individuals from each population. These genes were chosen so that my sequences could be integrated with that of Perkins et al. (2009), which has the best molecular framework for identification of capsalids. Assoc Prof Ian Whittington provided additional specimens from five different host fish for comparison.

Dr Terry Bertozzi possesses extensive knowledge in the molecular genetic analysis of capsalid monogeneans and his careful instruction ensured that I learnt how to extract DNA, perform PCR amplifications, run gel electrophoreses and analyse species sequence information obtained from

the preserved *Neobenedenia* specimens. Assoc Prof Ian Whittington assisted in the morphological identification of many of the samples to genus level and also in slivering smaller specimens for DNA extraction. Extracting DNA from all preserved specimens occupied most of the first week in Adelaide with few complications. The remaining time was spent performing PCRs and fine tuning the parameters for maximal DNA amplification for the genes of interest. I also tried to build on a preliminary genetic framework for *Neobenedenia* based on the mitochondrial gene cytochrome B, however this study is in its infancy and I was not able to amplify my samples due to an incompatibility of the primers available. The work on this gene is being continued by Dr Terry Bertozzi and myself in correspondence. I was able to obtain sequences from the nuclear genes histone H3 and 28S for the majority of capsalid samples. Sequencing results are currently being compiled and analysed. This research significantly adds to broader questions that both Dr Terry Bertozzi and Assoc Prof Ian Whittington intend to work on pertaining to capsalid genetics.

The skills obtained during this trip will be useful not only in my PhD but for the rest of my scientific career. Both Dr Terry Bertozzi and Assoc Prof Ian Whittington offered unique and integral scientific educational experiences to developing and improving my knowledge of Monogenea and overall research abilities. The work undertaken during this researcher exchange trip contribute to the proposed publication, "Identifying *Neobenedenia* distribution and host-specificity by molecular characterisation" intending to be published in *Molecular Phylogenetics & Evolution*. This work comprises a major component of my PhD thesis on *Neobenedenia* sp. ecology, biology and physiology and represents the first of six data chapters in my PhD. I plan to continue to develop this research and present the results gained from this researcher exchange at the 2014 ASP conference in Canberra.



## State News continued

turtles in Moreton Bay and is supervised by **Rebecca, Paul Mills, Thomas Cribb, Mark Flint** and **Myat Kyaw-Tanner**. Rebecca has just returned from Timor Leste, where she conducted a three-day workshop on faecal parasite detection at the Ministry of Health as part of an NHMRC partnership (Water Aid) funded project lead by Archie Clements at the School of Population Health, UQ. The trip was definitely an 'eye-opener' and has provided Rebecca the motivation to keep working on research into NTDs.

**Anne Beasley**, Postdoctoral Research Fellow, is up to her eyeballs in horse manure! She's received an overwhelming response from horse owners following her request for samples which will help her with her investigation into the prevalence of Macrocytic Resistance in small strongyles and *Parascaris equorum* on Australian horse farms. She hopes to move out of the parasitology lab soon and into the molecular lab to optimise an assay that will allow simultaneous detection of the 13 most common small strongyle species, and also to develop some *in vitro* diagnostic tools." Anne, along with Prof. **Glen Coleman**, and Dr **Andrew Kotze** (CSIRO Livestock Industries) are working together on this project which is funded by the RIRDC.

**Sujeevi Nawaratna**, student of **Mal Jones, Geoff Gobert** and **Don McManus**, and based at QIMR, submitted her PhD thesis in January. Sujeevi's work involved a comprehensive transcriptomic analysis of specific schistosome organs as a means to antigen discovery and spent many happy(?) hours using a microdissection microscope to pick out those organs from the minute parasites. Sujeevi is now working with **Kathy Andrews** from Griffith University and QIMR on drug discovery for malaria control. **Mal Jones** travelled to Nong Lam University in Vietnam to teach veterinary parasitology to their English-language Advanced Veterinary Program. Travelling with his wife Alison, Mal arrived just in time for the Western New Years' Eve celebrations, which were a lot wilder than expected, with millions of people cramming just about every street in downtown Ho

Chi Minh City. The interaction with the small class of students was great fun. The students were keen to learn and all gave some very high-quality presentations on infectious agents of animals. Unfortunately, Mal won't get to return to Nong Lam Uni to teach, but he has added a tour through Vietnam to his list of future holidays. Mal has welcomed a new student, **Mahdis Adhazadeh**, to his lab. Mahdis is investigating angiostrongyliasis in SE Qld and spends much of her time collecting rats and slugs looking for these rather pretty, but pathogenic, lungworms.

## UQ-QAAFI and Queensland Government DAFF - Applied Biotechnology Livestock Group

### The University of Queensland St. Lucia Campus

**Jess Morgan** and **Rosie Godwin** welcome **Elmabruk Gamag** to the Cocci lab to help them with their research on *Eimeria* population genetics. Elmabruk will be developing *Eimeria maxima* microsatellites as part of his Masters degree through UQ. Tao Xu, supervised by **Manuel Rodriguez Valle** (as primary supervisor) and **Ala Lew-Tabor** is rocking with his cattle tick (*Rhipicephalus microplus*) serpin expression and characterization, now in his 3rd year. We welcome to the lab this year PhD candidate **Greta Busch** and Science Honours student **Eric Dover** - both working on different aspects of paralysis tick (*Ixodes holocyclus*) vaccine development (supervised by **Manuel** and **Ala**). Ala still works on the bacterial cause of cow 'clap' (venereal diseases) with Lea Indjein recently submitting her PhD and we welcome **Yusra Nordin** who is undertaking Honours

(Biotechnology) developing molecular diagnostic assays based on our new genomic studies. Last January we farewelled **Rodrigo Cunha** from EMBRAPA Brazil who undertook 6 months training in our lab with Manuel towards his cattle tick vaccination PhD studies. This year QAAFI has obtained RHD enrolment status which is great for our new Institute and our group in general. Hope to catch up at WAAVP!

## James Cook University

### Townsville Campus, Marine Parasitology Laboratory

Teaching began in February for **Kate Hutson** who coordinates and teaches a summer intensive subject, *Sustainable Aquaculture*. Undergraduate students had the opportunity to sample parasites on wild fishes that associate with aquaculture farms as part of the course. **Terry Miller** (Cairns campus) also got involved in the course delivering guest lectures and helping with fieldwork. In addition to her teaching commitments, Kate has recently finalised a book chapter on infectious diseases of Asian sea bass.

Postgraduate students in the laboratory have been industrious. PhD student **Alexander Brazenor** is currently working at the South Australian Museum with **Ian Whittington** and **Terry Bertozzi** on the systematics of capsaid monogenea. Alex's travel was enabled by a recent ASP travel award. Masters of Applied Science student **Alejandro Trujillo** (supervised by Kate and **Constantin Constantinoiu**, School of Veterinary and Biomedical Sciences) recently submitted his thesis examining primary and secondary defense mechanisms of fish against ectoparasites. Alejandro plans to expand his research work and complete a Masters by Research degree this year. **Thane Militz** was awarded the School of Marine and Tropical Biology Prize for Best BSc Honours student for his thesis 'Efficacy

## State News continued

of garlic on *Neobenedenia* sp. (Monogenea) infecting barramundi (*Lates calcarifer*).<sup>1</sup> Congratulations Thane! He has since written a manuscript which has accepted for publication. Thane will commence his PhD research later this year.

# South Australia

## South Australian Museum / University of Adelaide

**Michael Reichel** and team from the University of Adelaide Vet School at Roseworthy Campus, are currently involved in a preliminary study that will establish the status of the *Besnoitia* species involved in clinical cases in western grey kangaroos. Should *B. besnoiti* (which is emerging as a pathogen of cattle in Europe) be confirmed as the cause, further work will be carried out to determine the risk to cattle populations in this country. This requires further determining the level of the infection (prevalence) in the wild animal population, as well as an assessment of the association between that prevalence and the antibody reactions previously observed in cattle.

Our proposed study will establish whether or not *B. besnoiti* may have a wildlife reservoir and present a risk to cattle populations in Australia. Should the study identify the wildlife-associated species as *B. besnoiti*, the sero-prevalence work will establish the extent and distribution of infection in the wildlife population, a preliminary assessment of the risk posed to cattle in South Australia and possibly further, nationally allowing some risk

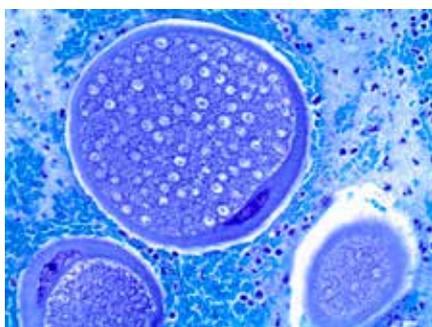
prevention and mitigation strategies to be developed in the future, if needed.



Taking a nasal swab from a Western grey kangaroo

Owners of a property near the Taillem Bend area of South Australia that had been reporting clinical signs in Western Grey kangaroos (epistaxis) suspicious of *Besnoitia* infection, provided animals to be examined at the School of Animal and Veterinary Science at Roseworthy. Nasal tissue samples and serum samples were collected under general anaesthesia. A *Besnoitia*-like organism was visualised in swabs from three individuals.

In addition, we were able to sample a further 20 kangaroos located at the property that had previously shown signs of epistaxis (nose-bleeding), obtained nasal swabs and tissue samples for examination and blood samples for future serology.



We are still looking for more clinical cases to isolate the organism, if anybody has a nose-bleeding 'roo, please contact **Wayne Boardman** on 08-83131246.

**Sarah Catalano**, third year PhD student at the University of Adelaide, is in the final months of her project investigating

the dicyemid parasite fauna of southern Australian cephalopods. In her studies, she surveyed 10 cephalopod species from six families and found seven host species to be infected by dicyemid parasites. A total of 11 new dicyemid species were documented, with formal descriptions of 10 of these new species complete. Sarah also used dicyemid parasites as biological tags to assess the population structure of *Sepia apama* (giant Australian cuttlefish) in southern Australian waters. Four sub-sets/populations of *S. apama* were identified from differences in dicyemid parasite fauna at each locality and dicyemid genetics between species at each locality. In the remaining months Sarah will be focusing on writing up her molecular phylogenetic chapters and drafting her thesis for submission mid-year. She is also preparing to attend the 88th Annual Meeting of the American Society of Parasitologists, held in Quebec City, Canada at the end of June, and hopes to add a research visit to Santa Barbara Museum of Natural History on the way home to work with the Curator of Malacology in stabilising dicyemid type material within their collection.

**Ian Whittington** has been mostly steeped in administration at the South Australian Museum. Presently he is one of a selection panel that also includes **Leslie Chisholm**, to appoint a new 2-year fixed term Collection Manager in Terrestrial Invertebrates with an emphasis on the extensive arachnid collection which of course includes mites and ticks. The new appointee will be responsible for relocating the large slide collection of arachnids, into new, purpose-built storage facilities. Leslie has already completed this task for all registered slides in the Australian Helminthological Collection. The new storage compactus that houses the arachnid and helminth collections has space for more than 70,000 slides, so now there is room to accession plenty of new material in both collections! The new 'space' has been renamed the *Parasitology & Arachnology Slide & Reprint Research Facility*. All specimens stored in spirit remain in the extensive spirit collection.

## State News continued

**Alex Brazenor**, a PhD student from **Kate Hutson's** Marine Parasitology Laboratory at James Cook University in Townsville has spent March in Adelaide working in the *South Australian Regional Facility for Molecular Evolution & Ecology*, an ARC LIEF-funded central node between the University of Adelaide, Flinders University and the South Australian Museum. Alex, under the watchful eye of **Terry Bertozzi** of the SA Museum's *Evolutionary Biology Unit* has been busy doing PCRs and sequencing several *Neobenedenia* isolates and other capsalid monogeneans to commence his PhD studies. Ian has been helping out with the morphological side of the story, by slivering tiny specimens so that there is a voucher specimen that links the sequenced tissues and interpreting trees. Alex's project is part of a larger scheme that Ian and Terry are planning to make sense of *Neobenedenia* species globally. In a nutshell, Alex aims to try to put a name to the isolates of *Neobenedenia* that he will work on throughout his PhD that are established in aquaria at JCU Townsville.

## Tasmania

### The University of Tasmania

The University of Tasmania's National Centre of Marine Conservation and Resource Sustainability (NCMCRS) recently hosted the ASP Parasitic Diseases in Fish Mariculture Workshop. The workshop, held in February was organised by **Professor Barbara Nowak** and included presentations by renowned fish parasitologists including **Professor Tom Cribb**, from the University of Queensland, Dr Sho Shirakashi from Kinki University Fisheries Laboratory Wakayama, Japan and Kazuo Ogawa from Meguro Parasitological Museum Tokyo, Japan. ASP student members including **Mark Polinski**, **Victoria Valdenegro** and **Stewart Dick** were also afforded the opportunity to present their research to these eminent parasitologists. The

workshop was attended by approximately 40 people including representatives from the Tasmanian salmonid industry. Following the workshop attendees were taken on a tour of the NCMCRS facilities including the Aquaculture centre and research laboratories.



*Images from the ASP Parasitic Diseases in Fish Mariculture Workshop. Top: ASP student member Mr Mark Polinski presenting results from his PhD research. Middle: Mr Alistair Brown from TASSAL (left) and Mr Paul Hardy-Smith from Panaquatic Health Solutions (right) Bottom: Dr Mark Adams showing Professor Tom Cribb, Dr Nathan Bott and Professor Kazuo Ogawa the NCMCRS Aquaculture centre research facilities.*

ASP student member **Melissa Martin** has recently given a *Discover More Talk* entitled "Hollywood Tongue Biter: Separating Fact from Fiction" at the Museum of Tropical Queensland, Townsville. Melissa used the recently released fictional movie "The Bay" as her basis for discussion about buccal-attaching parasitic fish crustaceans. The horror movie is about how contaminated waters resulted in the creation of mutant fish crustacean isopods that unleashed a deadly plague upon the community of Chesapeake Bay, USA. In her presentation, Melissa explained what was fact and what was fictional about the movie and discussed buccal-attaching parasitic fish crustaceans and the significance of this topic to her PhD research. Her presentation was well received from a wide group of audience consisting of aquarist, students, and even senior veterans. Ms Martin was also featured in the Townsville *Bulletin* which gives a synopsis about the existence of fish parasitic isopods and her research input to a better understanding of the Australian fauna.



*Melissa Martin presenting at the Museum of Tropical Queensland, Townsville.*

Congratulations to ASP student members **Mark Polinski**, **Victoria Valdenegro Daw** and **Megan Stride**. Mark has received international travel support from the Fisheries Society of the British Isles (FSBI) and University of Tasmania (UTAS) to attend the first conference of the International Society of Fish and Shellfish Immunology to be held this coming June in Vigo, Spain. Mark will be presenting work concerning the identification and transcriptional regulation of immune related genes of Bluefin tuna, as well as methods