

International Ichthyoparasitology

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CONTENTS

[Editorial](#)

[Announcement](#)

[Current Research Activities in Various Countries](#) ([Kenya](#), [Australia](#), [Brazil](#), [Iraq](#), [Spain](#), [UK](#), [USA](#))

[In Memoriam](#) (Bob Kabata, Ching-Long Lin, Susan Lim, Ian Whittington)

[New Book](#)

[Editorial Policy](#)

EDITORIAL

As always, I thank everyone who has contributed to this issue of the Newsletter. I also thank Kate Hutson and David Gibson for their editorial assistance and David for posting the Newsletter on his website. I welcome Simone Chinicz Cohen, who is the new Regional Representative for Brazil. 2014 will be remembered as a busy but very sad year with the loss of four eminent fish parasitologists including Professor Bob Kabata, Professor Ching-Long Lin, Professor Susan Lim and Associate Professor Ian Whittington.

I met Bob Kabata in 1988 when I was a young MSc student studying copepods. I was at my very first meeting, the International Conference on Copepoda, held at the then British Museum (Natural History). I felt honoured to be present when the intention to name a new copepod *Bobkabata kabatabobus* was announced.

I met Susan a few years later at the University of Guelph when she was working in Patrick Woo's lab. It was immediately clear that she was a dynamic person with fantastic drive and curiosity. Over the years, I looked forward to each meeting and was always greeted with the inevitable "Ohhh! Leslie, you're so skeeeeny".

I have yet to fully realise the impact of the passing of Ian. I came to Australia from Canada to do my PhD with Ian, was introduced to the wonderful world of experimental fish parasitology and was lucky enough to have the Great Barrier Reef as my laboratory. The past 20 years has been a whirlwind of field trips, hours of staring down microscopes and writing papers with Ian. He was a dedicated researcher and a wonderful mentor (Image: Leslie, Vanessa Glennon and Ian collecting monogeneans at the Annual Port Stephens Interclub Game Fishing tournament).



The untimely deaths of Susan and Ian will leave a void in the monogenean research community that will be difficult to fill.

If you wish to contribute to the next issue of the Newsletter (Number 23), the deadline date for submission is **November 15, 2015**. My contact details are at the end of this Newsletter. This, and future issues, will be available on David Gibson's Web Pages at: <http://www.diplectanum.talktalk.net/newsletter/>

ANNOUNCEMENT

9th International Symposium on Fish Parasitology

The 9th International Symposium on Fish Parasitology (ISFP) will be held between August 31 and September 4, 2015 in Valencia, Spain, and we invite you to enjoy what will be an exceptional scientific event. Valencia is a wonderful and lively cosmopolitan Mediterranean city full of historical and modern architecture, monuments and nice beaches, and has one of the largest European aquariums. You will delight in our lifestyle and have great gastronomic experiences.



The Symposium is being organised by the University of Valencia and the Spanish National Research Council (CSIC). The scientific programme will include all research fields in fish parasitology, with a special interest on the “New Challenges in Fish Parasitology” facing us in future years. Under the format of sessions and workshops, the conference will deal with topics such as: parasites affecting aquaculture and fisheries, fish-borne diseases, diagnostics and management of parasitic diseases, biodiversity, parasites and global change, parasites as bio-indicators of pollution and environmental quality, alien and invasive species, emerging diseases, ecology and evolution, life cycles and food webs, histopathology and immunology, morphology and physiology, and systematics and phylogeny. Special sessions will also focus on the major taxonomic groups: Protista, Fungi, Myxozoa, Monogenea, Trematoda, Cestoda, Acanthocephala, Nematoda and Crustacea.

The scientific programme will include plenary talks by prestigious invited speakers, oral presentations and poster sessions to promote debates, as well as a networking forum. Best student presentations will also be awarded.

Further details will be announced on the ISFP website www.9isfp.com

For questions, please contact 9ISFP@adeituv.es

We look forward to welcoming you at the 9th ISFP in Valencia 2015!

The Organizing Committee



VNIVERSITAT
DE VALÈNCIA



CSIC

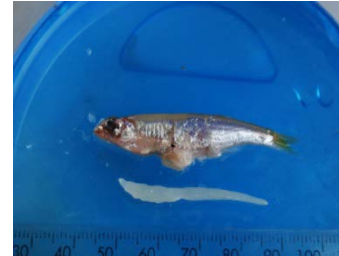
CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS

CURRENT RESEARCH ACTIVITIES IN VARIOUS COUNTRIES

KENYA

provided by Penina Aloo, alooopenina@yahoo.com

In Kenya, we are working on effects of the cestode *Ligula intestinalis* on the cyprinid *Rastrineobola argentea* in Lake Victoria. We have established the impact of the parasite on fish fecundity and the relationship between fish and parasite size. Parasite load in the various size-classes has also been established. The team include **C. Ogwai**, **P. Aloo** and **D. Oyugi**. A paper on the findings is almost ready for submission.



AUSTRALIA

provided by Kate Hutson, kate.hutson@jcu.edu.au and Leslie Chisholm, leslie.chisholm@samuseum.sa.gov.au



The *Marine Parasitology Laboratory* led by **Kate Hutson** has enjoyed a productive year in 2014, and members contributed several oral and poster presentations on parasites of fishes as part of the Australian Society for Parasitology 50th anniversary conference in Canberra. **Kate Hutson** (pictured left) recently finalised her work on the monotypic genus, *Kabataia*, with Prof. **Geoff Boxshall** (Natural History Museum, London) for a special edition of *Zootaxa* in honour of Prof. **Il-Hoi Kim**.

We are currently using a capsalid monogenean model to answer several questions regarding parasite systematics, reproductive biology and aquaculture management. PhD student **Alexander Brazenor**, in collaboration with **Ian Whittington** (South Australian Museum), **Terry Bertozzi** (South Australian Museum) and **Terry Miller** (James Cook

University) has worked to resolve the phylogenetic relationships between Australian *Neobenedenia* spp. isolates and specimens collected abroad. Alex has also investigated the effects of temperature on the early life biology of *Neobenedenia* sp., including fecundity, egg volume, egg biochemical content and embryonic utilisation. MSc student **Alejandro Trujillo-González** recently published his research on the histopathology associated with the site of haptor attachment of *Neobenedenia* sp. to its host fish (barramundi, *Lates calcarifer*), with collaborators from the JCU veterinary school, **Constantin Constantinoiu** and **Linda Johnson**. More recently, he has finalised experiments that examined *Neobenedenia* oncomiracidia and juvenile microhabitat selection. Masters student **Dinh Hoai Truong** published research on the reproductive biology of *Neobenedenia* sp., which can reproduce in isolation for three generations and exhibits distinct egg-laying rhythms and hatching rhythms. Following his project, **Dinh**

Hoai returned to Vietnam National University of Agriculture as a lecturer in fish pathology, before moving to Japan to undertake his PhD in with a focus on fish histopathology caused by parasites. **Thane Militz** recently examined the capacity for cleaner shrimp, *Lysmata amboinensis*, to eat *Neobenedenia* eggs and larvae under diurnal and nocturnal conditions. We were excited to discover that cleaner shrimp significantly reduced the abundance of eggs and larvae of *Neobenedenia* sp. Furthermore, in the absence of cleaner shrimp, *Neobenedenia* larvae exhibited higher infection success on their hosts.

PhD student **Giana Bastos-Gomes** (pictured right), supervised by **Kate** and **Terry Miller**, won travel funds from the Australian Society for Parasitology to travel to the US to work with **Professor Laura Katz**, who specialises in eukaryotic evolution through phylogenetic reconstruction, community sampling and analyses of genome evolution. During her visit, **Giana** learnt how to culture *Chilodonella* spp. *in vitro*, a tool that will be fundamental to her research on parasitic *Chilodonella* infecting freshwater farmed fish. Since returning from her trip, she has been thrilled with several successful *Chilodonella* cultures that she has established from barramundi farms.



The laboratory has been particularly productive through the hard work and enthusiasm of students supervised by **Kate** and **Terry Miller**. Masters student **Soranot Chotnipat** tackled a difficult parasite group with his work on diplectanid monogeneans infecting wild and farmed barramundi, *Lates calcarifer*. He found a single, dominant species in Australian waters compared to a more biodiverse fauna documented from the same host species in Asia. **Luke Barron** completed his Honours research, investigating diplectanid gill fluke infections in gold-spotted grouper (*Epinephelus coioides*) and giant grouper (*E. lanceolatus*) being developed for aquaculture in tropical northern Australia. The first component of his project was focused on diagnosing the species present on these grouper species in aquaculture in northern Australia, and the remainder of his research examined the use of orally administered praziquantel to treat persistent gill fluke infections in these two grouper species. **Luke's** research led to the discovery and description of a new diplectanid species from *E. lanceolatus*, and the development of protocols and procedures for administering appropriate doses of praziquantel 'in-feed' that eliminates the associated un-palatability often associated with use of this drug in fish. **Tim Jenkins** examined the myxosporean fauna of the Latidae. He described three new *Henneguya* and one new *Kudoa* spp. from the gills and muscle of *Psammoperca waigiensis* off Bali, Indonesia, *Lates niloticus* from Lake Victoria, Kenya and *L. calcarifer* off tropical north Queensland, Australia. **Tim** is keen to continue his studies in parasitology and is currently applying for Master's programmes back in his home region of Europe. Visitor, **Daniel Brady**, spent six months in the lab working on redescrptions of three poorly known Australian argulids. He is now in Glasgow embarking on a molecular parasitology postgraduate course.

The *Marine Parasitology Laboratory* academic staff and students were saddened by **Ian Whittington's** death in October 2014. We had the pleasure of hosting **Ian** in our laboratory in July 2011, where we carried out collaborative work on capsalid monogeneans, and he was involved in ongoing collaborative research with our laboratory. **Ian** was an inspirational mentor and he will be greatly missed.

At the South Australian Museum Professor Emeritus **Lesley Warner** continues her work on the Acanthocephala. She attended the 8th Acanthocephalan workshop in Freudenstadt, Germany, September 29 – October 1, 2014, where she presented her work on acanthocephalans of Australian fishes.

provided by Shokoofeh Shamsi, sshamsi@csu.edu.au

At **Charles Sturt University (CSU)**, many young researchers are beginning their careers in fish parasitology under the supervision of **Shokoofeh Shamsi**. **Phoebe Makepeace** received an EH Graham Centre for Agricultural Innovations summer scholarship to work on the morphological and molecular characterisation of fish nematodes.

Anna Turner (pictured right with **Shokoofeh**) completed her project (supervised by **Shokoofeh** and **Skye Wassens**) on parasites of introduced freshwater fish in NSW and received the Dean's High Distinction Honours award. **Anita Poupa** investigated the molecular taxonomy of nematodes.



Thanks to Dr **Julian Pepperell**, the CSU Fish Parasitology group (**Shokoofeh**, **Phoebe** and **Tara Cassidy** [pictured left],) travelled to Nelson Bay to collect parasites from marlin and sharks at the Port Stephens Interclub Game Fishing Tournament. Various parasites were collected from these fishes as part of an ongoing research study on the life cycle of anisakid nematodes.

The group attended a number of conferences this year. **Shokoofeh** presented her work on “Emerging parasites in Australian seafood” at the 4th Aquatic Animal Health Technical Workshop. At the 50th Anniversary of the Australian Society for Parasitology, the group gave a review of Australian freshwater fish parasites and the characterisation of ascaridoid larval nematodes from selected fish in New Caledonia. **Shokoofeh** was invited to discuss “Dangerous dead or alive: emerging zoonotic parasites in Australia seafood” at The Australian and

New Zealand College of Veterinary Scientists, Science Week Conference. In December, **Shokoofeh** ran a workshop on identification of marine nematodes and gave a keynote address at the Global Meet on Parasitology, held in University of Allahabad, India.

Shokoofeh and **Jean-Lou Justine** from the Muséum National d'Histoire Naturelle, Paris, completed phase 1 of the identification of ascaridoid nematodes in New Caledonian waters. **Shokoofeh** has also received a grant from LifeWatch to complete and update the taxonomy of anisakid nematodes in the WoRMS database.

BRAZIL

(provided by Simone C. Cohen – scohen@ioc.fiocruz.br)

LABORATÓRIO DE HELMINTOS PARASITOS DE PEIXES – INSTITUTO OSWALDO CRUZ, FIOCRUZ



The Laboratory of Helminth Parasites of Fishes of the Instituto Oswaldo Cruz includes **Simone C. Cohen** (scohen@ioc.fiocruz.br), **Berenice M. M. Fernandes** (berenice@ioc.fiocruz.br), **Marcia C. N. Justo** (marciajusto@ioc.fiocruz.br) and **Melissa Q. Cárdenas** (melissaq@ioc.fiocruz.br). **Anna Kohn** (annakohn@gmail.com) retired in 2014, after 52 years of research. Over this time she made significant contributions to our knowledge of the taxonomy and systematics of fish helminths and gave rise to a generation of new researchers who continue these

helminthological studies.

The projects developed by the group comprise the study of the fish parasites in the reservoir of the Hydroelectric Power Station of Itaipu, Paraná State, including studies on Monogenoidea from fishes cultivated in cages by **Mariana dos Santos Lopes Leão** for her PhD studies. Continuing studies of tuna parasites, **Marcia C. N. Justo** and **Anna Kohn** published new data on taxonomy, with a report on Monogenoidea and Digenea of *Thunnus atlanticus* and studies on the histopathology of didymozoids. **Berenice M. M. Fernandes**, **Simone C. Cohen** and **Melissa Q. Cárdenas** are studying helminths from marine fishes caught along the Rio de Janeiro coastline.

New projects are being developed involving helminths of freshwater fishes from river basins in the north region of Brazil. This includes the report of anisakid larvae in fishes and study of the helminth parasites of species of *Leporinus*, which is the subject of the PhD thesis of **Williane M. O. Martins**. These projects include descriptions and redescrptions of species using morphological and molecular data.



The book “South American Monogenoidea Parasites of Fishes, Amphibians and Reptiles”, with list of species, hosts, geographical distribution and figures was published by Cohen, Justo & Kohn in 2013 and is available free, upon request, to the authors.

LABORATÓRIO DE ICTIOPARASITOLOGIA – UNIVERSIDADE ESTADUAL DE MARINGÁ, PARANÁ STATE, BRAZIL

provided by Ricardo Takemoto

The *Laboratório de Ictioparasitologia* is of national and international importance in the study of fish parasites. Under the leadership of Dr **Gilberto C. Pavanelli** and Dr **Ricardo M. Takemoto**, we have published on fish parasite taxonomy, ecology, molecular biology, phylogeny, pathology and parasites in aquaculture.



In association with several universities throughout the country, our laboratory carries out surveys not only in the Upper Paraná River floodplain and in several Brazilian basins, including reservoirs in the States of Paraná and São Paulo, and but also in brackish environments. Studies are also being carried out at fish farms in Paraná State.

The Laboratory maintains exchanges with several researchers from other institutions and countries. In September, Dr **Tomáš Scholz**

(Institute of Parasitology, Czech Republic) stayed with us, giving lectures and visiting the field base of Nupelia (Center for Research in Limnology, Ichthyology and Aquaculture).

Students and laboratory researchers participated in the XIII ENBRAPOA (Brazilian Meeting of Pathologists of Aquatic Organisms held in Aracajú, Sergipe) organised by Dr **Ricardo M. Takemoto** and Dr **Maria de los Angeles P. Lizama**, in addition to Dr **Rubens R. Madi** and Dr **Veronica de L. S. Jeraldo** (Universidade Tiradentes), and Dr. **Rodrigo Fujimoto** (EMBRAPA, Sergipe). This meeting brought together researchers and undergraduate/graduate students from Brazil and other countries (Chile, Argentina, Uruguay, Portugal and the Czech Republic).



Several of our PhD students had visiting internships at international universities investigating fish parasites. **Geza T. R. e Souza** developed part of her thesis at Environment Canada, Montreal, Canada, under the supervision of Dr **David Marcogliese**, and at the Department of Biology, Concordia University, Montreal, Quebec, under the supervision of Dr **John Daniel McLaughlin**. PhD students **Fabricio H. Oda** and **Janaina Gazarini** were at the Marine Zoology Laboratory of the Cavanilles Institute of Biodiversity and Evolutionary Biology, University of Valencia, Spain, under the supervision of Dr **Juan Antonio Balbuena Diaz-Pines**. **Leticia Karling** visited Lund University, Sweden, under the supervision of Dr **Anders Nillson**.



Our cumulative knowledge over the years contributed to the publication of several scientific articles, book chapters and books. A recent book is "Parasitologia de peixes de água doce do Brasil", compiled by Dr **Gilberto C. Pavanelli**, **Ricardo M. Takemoto** and **Jorge C. Eiras** (Porto University, Portugal), which encapsulates the work of students, laboratory researchers and

numerous researchers of national and international reputation.

LABORATORY OF FISH PARASITOLOGY, UNIVERSIDADE FEDERAL RURAL DO RIO DE JANEIRO

provided by J. L. Luque

Through 2014 we continued our research on the parasite biodiversity of neotropical fishes, which includes our project “Integrative taxonomy: a powerful tool to unravel hidden diversity of fish parasites in Brazil”. The project is coordinated by **J. L. Luque** and involves participation by **Tomáš Scholz**, who, for the second year in a row, had a three month visit to the UFRRJ. Extensive sampling was done on the Parana River (with the collaboration of **Ricardo Takemoto**) and Araguaia River (with the collaboration of the Federal Institute of Tocantins).



Two PhD students, **Philippe Alves** and **Felipe Bisaggio**, and postdoc. **Fabiano Vieira**, spent several months at the Institute of Parasitology, Czech Republic, to work on the integrative taxonomy of proteocephalideans and nematodes. **Philippe** also visited the Natural History Museum, Geneva, and worked with **Alain de Chambrier** on a proposed new proteocephalid genus from catfish in the Xingu River (Amazonian basin).



In September, **Tomáš Scholz** and other members of the lab attended the XVII ENBRAPOA. **Marcelo Oliva** (Universidad de Antofagasta) and **Juan Timi** (Universidad Nacional de Mar del Plata) also visited us and spoke at the XVII Enbrapoa.

Finally, in November the lab. had a visit from **Gerardo Pérez Ponce de Leon** (Universidad Nacional Autónoma de México). He spoke at the International Symposium of Veterinary Sciences at the UFRRJ organised by **J. L. Luque**.

IRAQ

provided by Prof. Dr Z. I. F. Rahemo, zohair_rahemo@yahoo.com

University of Salah Al-Din (Erbil, Kurdistan). All fish biologists and parasitologists were happy at the opening of a Fisheries Department at Salahadin University, College of Agriculture. This was accomplished through the initiative of fish nutritionist Dr **Samad Sofi Omer**, who is the Head of the Department, in collaboration with ichthyoparasitologists Prof. Dr **Shamall M.A . Abdulla**, Prof. Dr **Zohair I. F. Rahemo**, Dr **Samir Bilal Jawdat** and aquatic ecologist Dr **Sarach Al-Din** (see photo below).

Mr **Younis S. Abdullah** (from Sulaimania University) and Prof. Dr **Shamall M. A. Abdullah** published a research article entitled '*Dactylogyrus skrjabinensis* (Monogenea: Dactylogyride): First occurrence on the gills of *Capoeta trutta*'. Specimens were collected from the Sirwan River, southeast of the Sulaimani Governorate, Kurdistan region.



University of Kirkuk. Ms. **Dalya Sudad Hashim** (supervised by Dr **Husain F. Hussan** and Prof. Dr **Shamall M. A. Abdulla**) submitted her MSc thesis entitled: 'Biochemical differentiation of parasites in some fishes of Northern Iraq'. Seven parasites were recovered, including *Bothriocephalus acheilognathi*, *Khawia armeniaca*, *Neoechinorhynchus iraqensis*, *N. zabensis*, *Postgangesia inarmata*, *Procamallanus viviparus* and *Senga* sp. Biochemical analysis revealed that the protein and carbohydrate content was low in parasites, as compared to their hosts, while the lipid, phospholipids, cholesterol and triglyceride content was comparatively high. DNA analysis and electrophoretic variations of hexokinase, glucose phosphate isomerase, malate dehydrogenase, malic enzyme, glucose-6-phosphate dehydrogenase and acid phosphatase were used to characterise the parasites.

University of Basrah (Department of Fisheries and Marine Resources). Dr **K. S. Al-Niaeem** had many research activities in collaboration with **S. A. A. Al-Azizz** and **F. H. Al-Ataby**. Their research included investigations on parasites of carangids and they published three papers on: the first record of a plerocercoid of *Floriceps minacanthus* from carangid fishes, the effects of trypanorhynch cestodes on carangid fishes, and monthly parasite variations. They also had a publication describing the first record of *Anuretes similis* (Siphonostomatidea: Caligidae) on the sordid rubberlip *Plectorhinchus sordidus* (Pisces: Haemulidae) from Iraqi waters of the northwest Arabian Gulf.

SPAIN

provided by Juan Antonio Raga, raga@uv.es



The Ichthyopathology Research Group (IRG), of the Biologia Animal, Vegetal i Ecologia Department from the Universitat Autònoma de Barcelona (UAB), specialises in research on and diagnosis of fish diseases and in the taxonomy, epidemiology and histopathology of parasitic diseases in both cultured and wild fishes. The team comprises senior researchers: **Maite Carrassón**, group heads, **Francesc Padrós** and **Maria Constenla**; PhD researchers: **Sara Dallarés** and **David Pérez**; and several postgraduate and undergraduate student collaborators (ten in 2014).

Our current lines of research are: 1) the study of parasites and diseases of wild fish species in the Mediterranean area as indicators of environmental stress, in order to assess the possible human impact on marine ecosystems; 2) the diagnosis and study of histopathological alterations and parasites in aquaculture and ornamental fish; and 3) the study of parasites and diseases associated with the culture of Atlantic bluefin tuna (*Thunnus thynnus*). We are collaborating with the Institute of Parasitology of the Academy of Sciences of the Czech Republic, the Marine Zoology Unit of the Cavanilles Institute of Biodiversity and Evolutionary Biology of the University of Valencia, the group of Parassitologia e Malattie Parassitarie from Italy (Dipartimento di Medicina Veterinaria, Università di Sassari), and the Helminthology research team in the Department of Microbiology and Parasitology (University of Queensland) from Australia. During 2014, we welcomed **Aneta Kostadinova** (Institute of Parasitology, Czech Republic) and **Ana Pérez-del-Olmo** (University of Valencia) to work on the identification of different deep-sea parasites. Also during 2014, we received training from the professionals **Mohammed Musthafa** and **Shuaib Thaiparampil** from the National Prawn Company (Fish Health & Biosecurity) and **Marta Polinas** from Università di Sassari (Dipartimento di Medicina Veterinaria). **Maite, Francesc** and **Maria** currently form the team of the Servei de Diagnòstic Patològic en Peixos (SDPP) (Service of Pathological Diagnosis in Fishes), which was founded about 15 years ago by Dr **Silvia Crespo**. The SDPP offers various services, including necropsy, rapid diagnosis, histopathology and basic microbiology of aquaculture and ornamental fish, environmental fish stock management, aquatic toxicology and applied research with fish as a model system.

During the last year, the IRG participated in several national and international conferences (Congreso Nacional de Acuicultura, XVIII Simposio Ibérico de Estudios de Biología Marina, 16th International Conference on Diseases of Fish and Shellfish, the 2nd Meeting in the Gill Health Initiative) and has published manuscripts about: the identification of a new species of Archamoeba (*Endolimax piscium*) affecting cultured *Solea senegalensis*, the benign effect of *Ceratomyxa* cf. *imbricata* on its host, the identification of new species, i.e. the nematode (*Capillostrongyloides morae*) and digenean (*Bathicreadium brayi*), from Mediterranean deep-sea fish and the description of the parasite fauna of *Bathypteroris mediterraneus*, *Mora moro* and *Alepocephalus rostratus*.

UNITED KINGDOM

provided by Jo Cable, cablej@cardiff.ac.uk

We have branched out onto other parasites this year, with research led by **Alex Stewart** investigating the effect of temperature variation on the immune system of the three-spine stickleback (*Gasterosteus aculeatus*). Our aim is to understand how climate change might affect fish stocks, particularly in aquaculture, so we can inform managers about how best to handle the fish and parasites in a warming climate. Together with the Environment Agency (**Chris Williams** and **Amy Reading**), we are using multiple parasites for our infections, including: *Saprolegnia parasitica*, *Argulus foliaceus* and *Camallanus lacustris*. In



collaboration with Dr **Joe Jackson** (Aberystwyth University), we have developed extensive qPCR assays in order to track the variation in immunity as a result of single or co-infected parasites and temperature variation.

Rhidian Thomas recently started his PhD on 'The effects of climate change on interactions between native fish and invasive species', which will also focus on the introduction of non-native parasites to Welsh rivers.

Also starting a PhD this year is **Willow Smallbone**, who will be assessing the effect of Major Histocompatibility Complex variation on the fitness, fertility, longevity, mate choice and parasite resistance (*Saprolegnia* and *Gyrodactylus turnbulli*) of our guppy model. This is a joint project with long term collaborator Dr **van Oosterhout** (Univ. of East Anglia), and is linked to a field based project run by Prof. **Jacek Radwan** (Poland). **Willow** will be conducting small scale experimental infections in the lab., while Dr **Karl Phillips** is managing a long term mesocosm experiment in Tobago. Of course, we all had to go and help **Karl** set up the experiment in the Caribbean. This included **Jess Stephenson**, who has worked extensively on the guppy-gyrodactylid system, most recently publishing her analysis of our long term data set - [Parasites of Trinidadian guppies: evidence for sex- and age-specific trait-mediated indirect effects of predators](#).



Our third new PhD student, **Mike Reynolds**, will also be working on gyrodactylids and is investigating the 'Direct and indirect impacts of climate change on host-parasite interactions in freshwater ecosystems'. Climate change has well documented direct effects on animals, but hosts may also be indirectly affected via their parasite communities. Using a series of flume experiments, Mike will investigate the effects of varying temperature and flow regimes on parasite transmission and shoaling behaviour of single and multi-

species fish shoals. This continues on from the research of **Fran Hockley**, who submitted her PhD thesis in September. Finally, **Dr Raquel Xavier** has been working on the genetic variation of gyrodactylids, revealing further complexity in the guppy system with evidence of cryptic species.

In the New Year, our research will be complemented by a new collaboration with Swansea and Aberystwyth Universities, plus stakeholders and local government, to minimise the impacts of intensive aquaculture in the face of climate change. We are currently recruiting two PDRA and two PhDs for this '[AquaWales](#)' project. Cardiff is officially the wettest UK city, so a good place to study aquatic biology! For more information about our research see our lab webpage, designed and managed by our post-graduates (www.cripescardiff.co.uk), and/or follow us on twitter @CRIPESCardiff

UNITED STATES

provided by Robin Overstreet, robin.overstreet@usm.edu and
Sascha Hallett, Halletts@science.oregonstate.edu

The Robin Overstreet Laboratory at the Gulf Coast Research Laboratory, University of Southern Mississippi, has had a busy 2014. The parasite thrust leaned heavily on systematics, life histories, indicators of environmental health and various biological activities, and zoonotic diseases. In addition to focusing on helminths, studies are also being conducted on protozoans and viruses.

Eric Pulis and **Michael Andres** have both successfully completed their dissertations (Eric in June, Michael in December), sorting out many of the haploporid trematodes of the world. Eric is still working on a variety of studies involving trematodes, including those in piscivorous birds, and is currently the assistant stranding coordinator and marine conservation ecologist at the Institute of Marine Mammal Studies in Gulfport, MS. Michael is continuing his work with trematodes and ascaridoid nematodes worldwide, with an emphasis on those in mid-water fishes. **Thomas Fayton**, a PhD student under **Richard Heard** and **Robin**, is studying the trematode genus *Plagioporus* as well as parasites of freshwater springs in Florida. **Andrew Claxton**, a new PhD student this year, is utilizing 40+ years of **Robin's** Atlantic croaker component community data and freshly collected specimens from the Gulf of Mexico to examine how the parasite community of Atlantic croaker has changed and how they serve as indicators. Technicians **Jean Jovonovich**, **Ronnie Palmer**, **Janet Wright** and **Denny Hugg** are involved with several ongoing investigations.

We have hosted several visiting scientists and undergraduate students working on fish parasites. **Stephen Curran**, who obtained his PhD at USM and is now a research scientist at GCRL, is involved with several studies, most of them involving trematodes of freshwater and estuarine fishes. **Robin** retired in 2014 but is participating in most of the above mentioned studies as well as investigations on marine zoonotic parasites and on diseases and fish abnormalities; he comes into his same laboratory daily. Additionally, Robin was honored by the American Society of Parasitologists with their Eminent Parasitologist Lectureship Award for his substantial contributions to both the field and the society. The photograph was taken in September 2013 during the GCRL Marine Parasite Reunion where Robin's colleagues, students, and staff reunited at GCRL to share stories and laughs.



The Bartholomew Lab. Research on the endemic myxozoan of salmonids, *Ceratonova shasta* (syn. *Ceratomyxa*), in the Pacific North West of the US continues to be core for the **Jerri Bartholomew** Lab. at Oregon State University. We use qPCR to monitor the weekly abundance of *C. shasta* in river water samples in the Klamath River. This past spring our monitoring triggered a reactive management plan: when parasite levels and river water temperature surpassed a disease-relevant threshold for endangered coho salmon, water was released from a reservoir (a pulse flow) in an attempt to reduce disease effects. Our lab. (**Sascha Hallett, Stephen Atkinson, Rich Holt, Ryan Craig, Julie Alexander** and **Gerri Buckles**) mobilized and collected water samples and polychaete samples (the definitive host) and conducted sentinel fish exposures both pre- and post-flow.

Two of our graduate students were awarded their degrees this year: **Charlene Hurst** completed her PhD on *The Ecology of Parasite Interactions within Chinook Salmon* and **Michelle Jakaitis** finished her MS on *Assessing Disease Impacts of Oregon Hatcheries on Downstream Fishes*; and **Sean Roon** defends his MSc this month on *Distribution and Interactions Between Macroparasites and Microparasites Within Juvenile Salmonid Populations in the Upper Willamette River*.

Our lab. was involved in organising the 7th International Symposium on Aquatic Animal Health held in August in Portland, Oregon. Myxozoan researchers participated in three special oral sessions and a workshop.



PHOTO: Myxozoan researchers at ISAAH in Portland, Oregon, USA

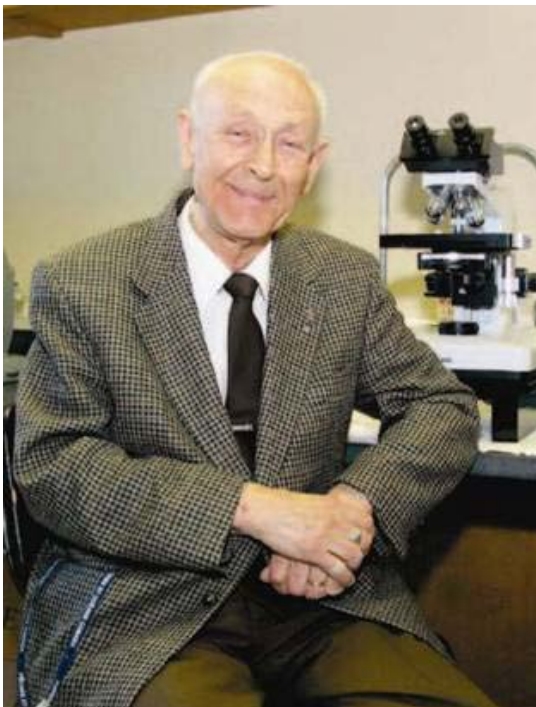
We enjoyed the company of many visitors back in Corvallis after the meeting! **Tiago Milanin**, PhD student with Dr **Edson Adriano** at the Federal University of São Paulo, Brazil, stayed on for three weeks. Two students of **Gu Zemao**, **Qingxiang Guo** 'QX' and **Luo Jia** 'Jack', visited us from the College of Fisheries, Huangzhong Agriculture University, Wuhan, China for six months each. **Gema Alama Bermejo**, a postdoctoral researcher at the Institute of Parasitology, Biology Centre, Academy of Sciences of the Czech Republic, continued her sojourn with us this year – she has recorded myxozoan developmental stages moving, and is using our myxo transcriptome libraries to investigate both locomotory proteins and proteases.

Many of us were involved with writing book chapters for **Myxozoan Evolution, Ecology and Development** - look out for it next year! **Sascha** enjoyed developing an online parasitology course with OSU's ecampus and was pleased to include the Australian Society for Parasitology's interactive multimedia electronic resource PARA-SITE (<http://parasite.org.au/para-site/introduction/index.html>).

Stephen Atkinson confused everyone by publishing a redescription of *Ceratomyxa shasta* and recategorizing it as *Ceratonova shasta* (thankfully we can still call it "*C. shasta*"). He continues to work with our *C. shasta* genome and transcriptome datasets to develop an assay to distinguish the parasite's different genotypes. Those data are being used also in two projects we have with **Tamar Lotan** (University of Haifa) to investigate the structure and mechanical properties of myxozoan polar capsules. **Stephen** also had a grant to survey myxozoan infections in marine annelids in Charleston Harbor, South Carolina, working with **Isaure de Buron** (College of Charleston). Their goal was to find the alternate host of *Kudoa inornata*, a myxozoan in spotted seatrout. Alas, they did not find the actinospore stage of *K. inornata* but discovered many other undescribed marine myxozoans. In collaboration with the Oregon Department of Fish and Wildlife, he completed development of a public database of pathogens of Oregon's fishes: <http://fishpathogens.net/>

IN MEMORIAM

Dr Zbigniew (Bob) Kabata (1924–2014)



Bob was born in Poland March 17th 1924. After Poland was invaded by Nazi forces in 1939, he joined the Armia Krajowa – the Polish Resistance. Bob was cited many times for bravery and during this time he started writing poetry. His most famous poem "The Underground Army" became the unofficial anthem of the Polish resistance and is seen on many Polish war memorials.

After the war, Bob went to Scotland, where he was a commercial fisherman for a while. When he started, he knew only about three words of English! During this time Bob developed his interest in aquatic animals and, in particular, fish parasites. He went back to school and obtained his doctoral degree and then worked as a fisheries scientist, first in Scotland and then in Canada for the Department of Fisheries and Oceans (DFO).

Bob made outstanding contributions in the field of parasitology, and is considered the world expert on parasitic copepods. His seminal work is "The Parasitic Copepoda of British Fishes". It contains over 2,000 illustrations hand-drawn by him. Bob discovered about 80 new species and has had numerous species named after him, including the copepod: *Bobkabata kabatabobus*. Bob has received many

awards and honours from Canada, Poland and numerous other countries – too many to list here. Among the most prestigious was the Order of Canada, awarded in 2007. Bob was a Research Scientist with the DFO for over 30 years; he retired and became an Emeritus scientist. There is an excellent documentary about Bob at: <http://www.science.gc.ca/default.asp?lang=en&n=A06EAAE3->

Our sincere condolences go out to his family and friends.

Laura Brown

Fisheries and Oceans Canada, Pacific Biological Station

Note: A memoriam entitled “*In memoriam: Zbigniew Kabata-- Metamorphosis of a Parasitologist, 17 March 1924-4 July 2014*” written by George Benz and Timothy Goater is published in the *Journal of Parasitology*, doi:[10.1645/14-690.1](https://doi.org/10.1645/14-690.1). A second obituary was published by John Mackiewicz and Zdzisław Świdorski in *Acta Parasitologica* during 2014, doi:[10.2478/s11686-014-0310-7](https://doi.org/10.2478/s11686-014-0310-7), and a ‘profile’ written by Ken Mackenzie was published in *Systematic Parasitology* (1995), doi:[10.1007/BF02185547](https://doi.org/10.1007/BF02185547).

Professor Ching-Long Lin (1950–2014)



Professor Ching-Long Lin died of pneumonia on the September 12, 2014, three years following unsuccessful surgery to remove a brain tumor. He was born on February 18, 1950 in a small fishing village – Chieh-Ding – located in Kaohsiung County of Taiwan. In childhood, he was very interested in Chinese chess, table tennis and bonsai, and he kept practicing and enjoying these childhood hobbies throughout his life, in addition to spending much of his life in research on fish pathology and copepod parasites of marine fish of Taiwan.

After receiving his BSc in Biology from the National Taiwan Normal University in 1976, he was hired by the Taiwan Branch of the Taiwan Fisheries Research Institute to establish a new Laboratory of Fish Pathology. In appreciation of his contribution to the studies on fish pathology of Taiwan, Ching-Long was awarded a one year fellowship by the Council of

Agriculture (a government agency of Taiwan) to advance his studies in fish pathology in the United States of America. Thus, in 1984 he went to USA and spent the first six months pursuing advanced studies at Auburn University in Auburn, Alabama and the following six months at Oregon State University in Corvallis, Oregon. Ching-Long realised the necessity of obtaining a higher degree to continue research in fish parasitology. He entered into a graduate program at the National Taiwan University in 1988 to work on the life cycle of *Caligus epidemicus* Hewitt and completed his MSc in 1990.

1991 was the turning point of Ching-Long’s career – switching from a research only position to research and teaching. He accepted an offer to teach as a lecturer at the Chiayi National College of Technology. In 1992 he decided to reenter the Graduate School of National Taiwan University to work toward his PhD, which he completed in 1996

on the caligid copepods (sea lice) of cultured marine fish in Taiwan. Then, his institution was promoted to become the National Chiayi University and he was appointed the chair of the newly established Department of Aquatic Biosciences. From this point onwards, Prof. Lin devoted most of his research effort to the systematics of parasitic copepods of Taiwan as part of a long-term collaboration with Prof. **Ju-shey Ho** of California State University. Together they published one book (on the sea lice of Taiwan) and 62 papers on the parasitic copepods of Taiwan over 19 years (from 1993 to 2012). In these publications, 151 species of parasitic copepods are reported, including the description of 45 new species and the creation of two new genera, *Macrostroto* (Taeniacanthidae) and *Parapericicola* (Chondracanthidae). Furthermore, Dr Lin provided kind and effective guidance to three Masters graduate students studying copepod parasites of Taiwan.

Prof. Lin is survived by his wife, Ching-Li Wu, and three sons, Jian-Wu (an MSc candidate at the Department of Aquatic Biosciences at the National Chiayi University), Wei-Zhi (a food technologist) and Wei-Ting (a chemical engineer). It was not uncommon to see Prof. Lin rushing out of the laboratory to run errands, pick up Wei-Ting from his school, or going home to prepare dinner for the family. He was truly a remarkable scientist as well as a wonderful family man.

Ju-shey Ho, Ph.D.

Professor Emeritus, Department of Biological Sciences
California State University, Long Beach

Attached photo shows Prof. C.L. Lin and his three graduate students: from left to right You-rong Cheng, Huan-yu Lin and Wei-cheng Liu. (The photo was taken in June 2010 at The 7th International Crustacean Congress held in Qingdao, China)

Professor Susan Lim (1952–2014)



Professor Susan Lim (or, to give her name in full, Lim Lee Hong Susan) passed away on August 2, 2014 after losing a long and brave fight with cancer. In a career spanning some 35 years, she became the leading Southeast Asian specialist on the Monogenea.

Born in the Malaysian State of Negeri Sembilan in 1952, Susan started school with no knowledge of English. Despite this initial handicap, by 1971 she had become a student (photo, right) at the University of Malaya in Kuala Lumpur studying zoology. Since it was difficult for an ethnic Chinese female to obtain training

abroad, she remained at the University of Malaya for her MSc and PhD (completed in 1987), funding her postgraduate studies as a careers tutor. Nevertheless, during this period, she was awarded international funds to study monogeneans with Dr Kálmán Molnár in Budapest and Dr Alec Gusev in St Petersburg.



Throughout the 1980s and 1990s, Susan published actively, describing numerous monogeneans and established herself as a recognised specialist on this group. Initially, she was retained on the university staff as a tutor, but her academic achievements were such that she was promoted to the permanent staff as a lecturer in 1989, becoming a full professor in 2003 (photo below, left). Susan's early work was on monogeneans of freshwater fishes, but she gradually transferred her attention to the marine fauna. In the 1990s she became well known internationally from her publications (<http://www.researcherid.com/rid/B-1075-2009>) and her active participation at international meetings, such the *International Symposia on Ichthyoparasitology* and the *International Symposia on Monogenea*.



As Susan was working in a region where the fauna was poorly known, her primary research was mainly alpha-taxonomic. She described more than 100 new species, several new genera and a new family. Together with her specific re-assignments, she became the sixth most prolific monogenean taxonomic worker ever (and the foremost female). In order to better categorise the taxa she had described, she undertook major generic revisions, such as those on *Hamatopeduncularia*, *Thaparocleidus*, *Calydiscoides* and *Neohaliotrema*, with a wider geographical relevance, in addition to completing general revisionary works and reviews. With an interest in functional morphology, she also described an entirely new net-like attachment mechanism formed by secretions of the haptor of some of her worms.

As reflected through the work of her students, Susan later turned her attention to a wide range of topics, including ultrastructure, molecular studies, 3D imaging, biotechnology and biodiversity database management. She had a great interest on passing on her expertise and in the training of taxonomists for filling present and future roles in biodiversity and wildlife management. Consequently, in addition to her university teaching duties, she supervised many postgraduate students and still had five PhD students at the time of her death.

In view of her interest in systematics, she became responsible for the type-collection of the Zoological Museum at University of Malaya and fought hard for a national collection of natural history specimens. She was twice Honorary Secretary of the Malaysian Society of Parasitology & Tropical Medicine and was awarded a life membership in 2009. Her productivity and the quality of her work lead to increased international recognition, substantial international travel and many co-operative projects. In 2006, this recognition culminated in her joining the International Commission for Zoological Nomenclature (the only Malaysian ever elected to this prestigious body).

Rarely a noted dresser, her wardrobe usually extending to a T-shirt and pair of jeans, Susan was a positive and energetic woman with considerable strength of character. She vigorously defended her work, colleagues and students; indeed, courage characterised her many fights for fair treatment, an advocacy which often got her in trouble with senior management. More than one reviewer has taken on the job of refereeing a Lim paper with some degree of trepidation. This belied her more usual convivial nature. Susan was

popular with colleagues and a genuinely nice person, with a good heart and jovial (often cheeky) disposition. She was a very hard-worker who needed very little sleep – often remaining in her laboratory until midnight, and known to e-mail co-authors at 2 am (her time).

Susan's passing is a great loss. She was a good friend to many and will long be remembered by those interested in monogeneans. Immortalised through the many new taxa she described, her influence will also live on in the form of her students, her published work and in the memories of her family, friends and colleagues.

An extended obituary is published in the *Bulletin of Zoological Nomenclature*, 71(4), 217-220 (Dec., 2014). <http://iczn.org/node/40419>

David I. Gibson and Peter K. L. Ng

Associate Professor Ian David Whittington (1960-2014)

Ian will long be remembered by his colleagues and friends as a passionate and enthusiastic scientist who held high, scrupulous standards and yet was modest and kind with an incredibly infectious sense of humour.



Born in the UK in 1960, Ian completed his PhD at the University of East Anglia in 1986 with Dr Graham Kearn, a leading authority on the Monogenea. Ian then moved to Australia in 1987, where he worked at the University of Queensland (UQ) in Brisbane as a Postdoctoral Fellow in the School of Biological Sciences. He won a prestigious Queen Elizabeth II Fellowship in 1990 and continued his work on Monogenea in the Department of Parasitology at UQ before accepting a Lectureship at the same institution (1993-1996). He maintained a high research productivity during his Directorship of UQ's Heron Island Research Station (1996 to 1999) and was promoted to Senior Lecturer in 1997. During his 15 years at UQ, Ian built and led the Monogenean Research Laboratory – the only Australian research team dedicated to the study of this group of fish parasites. In July 2001, his group had the honour of hosting the 4th *International Symposium on Monogenea*, demonstrating significant international recognition for Ian's research during his early to mid-career.

In January 2002 Ian's status as an outstanding scientist was acknowledged when he was recruited by the then Director, Professor Tim Flannery, of the South Australian Museum (SAMA) to take on the role of Senior Research Scientist heading the Parasitology Section. This was a joint appointment with the University of Adelaide (UoA) where he delivered ever popular parasitology lectures. In 2006, he was promoted to Principal Research Scientist/Associate Professor.

Ian made numerous overseas study visits to further his investigations of monogeneans, which included trips to Japan (1999-02), Borneo (2002), México (2002, 2006), New Caledonia (2008) and Brazil (2011), and hosted international exchanges in his Australian laboratories. Ian promoted innovative studies of whole parasites to understand parasitism in relation to structure, ecology, life history, systematics and taxonomy and that of their host(s). His holistic studies focused on live parasite biology, behaviour, life cycles, systematics and evolution. The specimens he donated to the Australian Helminthological Collection at SAMA constitute the major proportion of monogenean holdings in this collection.

Ian published more than 170 peer-reviewed papers over his career and led 40 major research projects to completion. He attracted many students and colleagues with his expertise and knowledge of marine parasites, humorous nature and welcoming personality. He was a dedicated mentor, lecturer and supervisor and provided a supportive, professional environment conducive to productive science and the promotion of excellence and exceptional quality. He supervised more than 25 PhD/Honours students and mentored postdoctoral fellows. Many of his former students now work in senior roles in aquaculture, academia and government.

Ian belonged to numerous professional organisations and was familiar to many international colleagues, especially those who attended the *International Symposia for Fish Parasitology* and the *International Symposia on Monogenea*. His research is well respected internationally and he made considerable contributions to the field through his work. He received more than 16 invitations to speak about his research at national and international conferences and contributed more than 14 invited peer-reviewed publications. He served as Section Editor for the *International Journal for Parasitology* and was on the Editorial Board of *Systematic Parasitology*, *Folia Parasitologica*, *Journal of Natural History* and *Acta Parasitologica*.



At SAMA, Ian had significant input into the stunning Biodiversity Gallery and the construction of the award winning museum website. Ian's formidable work ethic remained strong and, although he was diagnosed with cancer in 2012, he took on the inconceivably demanding administrative roll as SAMA Head of Biological Sciences. He spent his final two years juggling his hectic schedule with chemotherapy appointments. He remained actively engaged in research and these administrative duties until his death.

Ian will be remembered as an inspirational mentor and leader, who changed and shaped the lives of his students and had the admiration and respect of his colleagues. On behalf of his former students, friends and colleagues our thoughts go to his loving and attentive son, Matthew.

Kate Hutson and Leslie Chisholm

NEW BOOK

Parasitism: The Diversity and Ecology of Animal Parasites. Revised Second Edition

Timothy M. Goater, Cameron P. Goater & Gerald W. Esch.

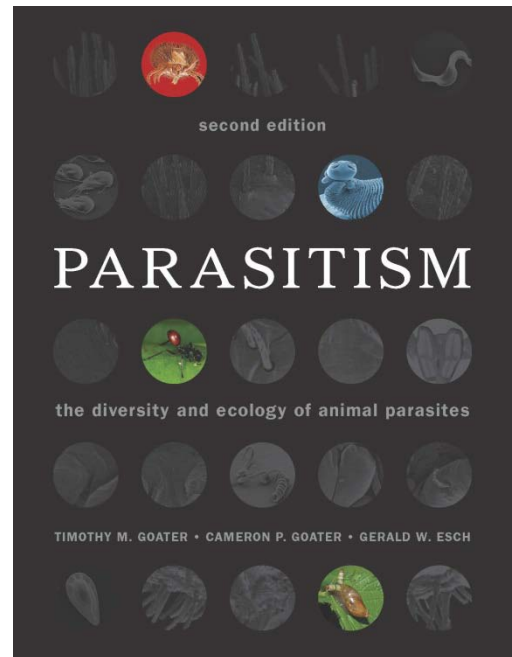
Published January, 2014, 505 pages.

ISBN: 978-0-521-19028-2 Hardback; Price: £95 (\$160).

ISBN: 978-0-521-12205-4 Paperback; Price: £40 (\$70).

Available from Cambridge University Press: www.cambridge.org/parasitism

The first edition of this book was published in 2001. Two core philosophies underlie the second edition. The first is that complex interactions that occur between parasites and their hosts – from the molecular cross-talk that occurs at the host-parasite interface, to the effects of parasites on host communities – are fundamentally ecological. The second is that a real appreciation for the phenomenon of parasitism requires knowledge of how natural selection has shaped parasite life cycles, life histories, and morphologies to solve particular problems associated with the parasitic lifestyle. Thus, for senior undergraduates who are being introduced to the phenomenon of parasitism in animals, the authors see a need for a single text with dual focus on the biodiversity and ecology/evolution of parasites.



This dual, interdisciplinary approach, under one cover, is the hallmark of the text. The 17 chapters, eight of which are new since the first edition, have been thoroughly revised to meet the needs of a new generation of parasitology students, whether their interests lie in ecology, conservation biology, evolution, immunology, medical, wildlife, or veterinary sciences. New chapters on primarily fish parasites (Microsporidia, Myxozoa), and an expanded section on parasitic Copepoda have been added in the new edition. In addition, several select host-parasite interactions involving fish parasites (e.g., *Schistocephalus solidus*, *Pomphorhynchus laevis*, *Lepeophtheirus salmonis*) are emphasised as models to highlight concepts in updated chapters in ecological, evolutionary, and environmental parasitology. Further information, including sample chapters and endorsements, can be obtained at www.cambridge.org/parasitism.

EDITORIAL POLICY

Please note that material for the next issue should be sent to the Editor, Dr Leslie Chisholm [e-mail: leslie.chisholm@samuseum.sa.gov.au] Parasitology Section, The Science Centre, South Australian Museum, North Terrace, Adelaide 5000, South Australia, Australia; **before** November 15, 2015.

The Newsletter is issued once a year and the persons listed on the cover page act as regional representatives. Each representative may write or collect information from the members of their country or region. Naturally, direct contributions from any recipient to the Newsletter are also welcome. The Newsletter is intended for any news, notices, comments, etc. that you feel would be of interest to the world's ichthyoparasitologists. Please note that publication lists are not accepted. The editor would be grateful if submissions would follow the format similar to that of the present Newsletter. Images are welcome. Please send images as separate JPG files (do not incorporate them in your text file and do not send image files as PDFs).

National representatives are asked to download a copy of each issue of the Newsletter and make this available (photocopies, e-mail, URL, etc) to his or her domestic members, where necessary. When it is impossible to download a copy, please advise the editor. In addition, the information in the Newsletter can be made available via E-mail.

Thank you

Leslie Chisholm

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