

International Ichthyoparasitology

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EDITORIAL

It is hard to believe that 2013 is fast drawing to a close. Judging from the activities written about in this Newsletter, it appears to have been a very productive and successful year for fish parasitologists worldwide. As always, I thank everyone who has contributed to this issue of the Newsletter and David Gibson for his editorial assistance.

I was saddened to learn of the passing of Professor Louis Euzet in September. Anyone who met Louis was touched by his vitality and exuberance and, in particular, his penchant for the topic of fish parasites and host-specificity. I still recall his reaction to one of the first talks I gave as a young PhD student. I had chosen to present a paper on the controversial issue of host-specificity in monocytylid monogeneans parasitising stingrays. Louis obviously did not agree with my final conclusions and, during the question period, he stood up looking visibly frustrated and uttered only “Lezzzzlie”, nothing more. After a long silence, which for me seemed an eternity, he just shook his head, gave a dismissive wave of his hand and looked pointedly at the audience with an expression of incredulity. He then sat down with a final theatrical shrug and a loud heavy sigh. I can smile now, but then I could only stand at the podium and try to not look as mortified as I felt. I will miss him very much. Further comments on Louis’ remarkable life and scientific career and can be found in the Memoriam section below.



If you wish to contribute to the next issue of the Newsletter (Number 21), the deadline date for submission is **November 15, 2014**. 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/>

ANNOUNCEMENTS

International Symposium 'Ecology & Evolution of Marine Parasites and Diseases March 10 – 14, 2014, Netherlands



The growing fields of marine ecological and evolutionary parasitology lack a platform that fosters the exchange among the divergent questions and approaches taken to understand the role of parasitism and disease in marine ecosystems. This symposium intends to fill this void with the aims of: i) collecting and synthesising our current knowledge on marine parasites and diseases; ii) facilitating the exchange of ideas and collaborations among researchers from different fields; and iii) identifying important future research avenues.

We are delighted to announce that the following invited speakers will join the symposium: **Robert Poulin** (University of Otago, NZ), **Mark Bertness** (Brown University, USA), **Kevin Lafferty** (USGS & UC Santa Barbara, USA), **Corina Brussard** (NIOZ & University of Amsterdam, NL), **Carolyn Friedman** (University of Washington, USA), **David Marcogliese** (Environment Canada, CA).

Themes of the symposium: i) Biogeography and macroecology; ii) Phylogeography and population genetics; iii) Local adaptation and co-evolutionary dynamics; iv) Direct and indirect effects of diseases on marine populations and communities; v) Parasites in marine food webs and effects on ecosystem functioning; vi) Drivers of epidemics and emerging diseases; and vii) Diseases in marine reserves and in marine conservation efforts.

For further information and registration please go to: www.marineparasites2014.org or contact either Mathias Wegner (mathias.wegner@awi.de) or David Thieltges, (david.thieltges@nioz.nl).

International Symposium on Aquatic Animal Health (ISAAH) Aug 31 – Sept 4, 2014



The 7th International Symposium on Aquatic Animal Health (ISAAH) will be held in Portland, Oregon, USA, Aug 31 – Sept 4, 2014. This is an international meeting that happens only every four years. It will be a great opportunity to learn what your colleagues are doing, to meet new people, and to establish new collaborations. Portland is an exciting place to visit for both a unique urban experience and for its proximity to the natural wonders of the Pacific Northwest. Information about the meeting will be updated at <http://www.afs-fhs.org>

MEETING REPORTS

7th International Symposium on Monogenea August 4 – 9, 2013, Rio de Janeiro

provided by Walter Boeger, wboeger@gmail.com and
Mariana Braga, Mpiresbr@gmail.com



The 7th International Symposium on Monogenea (ISM7), held at the South American Hotel in Copacabana, Rio de Janeiro, Brazil, on August 4–9, 2013, was a great success. Eighty-two participants from 17 countries presented 15 invited papers, 38 regular research papers and 51 posters. These were presented over five sessions and covered various aspects of the taxonomy and biology of monogenean parasites.

The symposium began with welcoming remarks by **Anna Kohn** and **Walter Boeger**, Chair of the Local Organising Committee. **Daniel Brooks** launched the formal presentations with the **A. V. Gusev Memorial Lecture** entitled “*Climate Change, Biodiversity and Emerging Diseases*”. Other keynote speakers addressed important topics on recent advancements in several areas of research, including some specific monogenean taxa (*Polystomatidae*, *Gyrodactylus salaris*, *Diplozoidae*) and aquaculture.

Two roundtable discussions were run during the meeting. One discussed the usage of DNA in several areas of study and the other, coordinated by **Andy Shinn**, **Marcus Domingues** and **Giuseppe (Beppe) Paladini**, deliberated the logistics of producing an online taxonomic site for monogeneans. There were interesting presentations on the subject, which included naming the world-champion of species description, **Delane Kritsky**, who has described more than 480 species!

Prizes for "Best Student Oral Presentations" were awarded to **Giuseppe Paladini**, University of Stirling, Scotland (first prize) and **Monika Mendlová**, Masaryk University, Czech Republic (second prize). **Maarten Vanhove**, also of Masaryk University, and **Grace Madanire**, University of Johannesburg, South Africa, received first and second prizes, respectively, for "Best Oral Presentation" by a young researcher. Awards for "Best Student Posters" were awarded to **Natalia Marchiori**, Universidade Federal de Santa Catarina, Brazil (first prize) and **Manuel Irigoitia**, Universidad Nacional de Mar del Plata, Argentina (second prize). **Iva Prikrylová**, (Masaryk University), received the prize for "Best Published Paper". Prizes included several books donated by our colleagues. Iva was also awarded a trip to collect monogeneans at the Marine Biological Station of the Milano-Bicocca University in the Maldives, generously offered by **Paolo Galli**. **Jean-Lou Justine** also offered free publication in the journal “*Parasite*” for those studies entered in the above competitions.

Mid-way through the symposium, participants enjoyed a break by experiencing a typical Brazilian day. It started at the wonderful Grumari Beach in Rio and included a traditional Brazilian barbecue and famous caipirinhas cocktails for lunch. This was followed by the customary beer contest (again, won by the Czechs and the French!) and by a performance by a Samba School with “mulatas”, where we discovered hidden Brazilian blood in some of our colleagues! On Thursday night, we had a great time at the Rio Scenarium, a famous

bar in old downtown Rio. With live music, many of us risked dancing to typical Brazilian music.

I should like to express my most sincere thanks to the people that helped me organise this meeting, including **Simone Cohen, Anna Kohn, Marília Brasil-Sato, Cassandra Monteiro, Letícia Larcher, Luciana Patella, Mariana Pires Braga, Emanuel Razzolini, Alini Vieira, Taisa Marques** and especially my wife, **Maria Regina**. At the close of the meeting, everyone was tired but satisfied with a great experience in Brazil. I should like to thank all of you that came to our meeting, and let those who could not make it know that you were missed. We hope to see you all in Brno for ISM8, which will be run by **Milan Gelnar** and his group.

The entire program along with a pdf of the abstract book and some movies are available at <http://www.ism7.ufpr.br>

To see pictures taken during ISM7, visit <http://www.flickr.com/photos/100982288@N02/sets/72157635292763816/>



2013 National Symposium on Fish Diseases

provided by Tingbao Yang, tingbao123@gmail.com,
Pin Nie, pinnie@ihb.ac.cn and Yongcan Zhou, zychnu@163.com

The National Symposium on Fish Diseases, organised by Hainan University and the National Professional Committee for Fish Diseases, was convened between November 3 and 5, 2013, in the beautiful coastal city of Haikou in Hainan Province, China. Participants included more than 400 scientists and aquaculture practitioners from different parts of China who work on diseases of aquatic animals. Dr **Murray Alexander** from Scotland delivered the keynote address, in which he discussed epidemiological practices in the industry contributing to the eradication of infectious salmon anaemia in Scotland.

Forty-three of the 311 abstracts submitted were about parasitic diseases of fish. These focused mainly on problematic species that frequently occur in aquaculture, such as *Cryptocaryon irritans* on cultured marine fishes and *Ichthyophthirius multifiliis* on many

species of freshwater fishes. There were also some papers which discussed the taxonomy, life-cycles, pathogenicity and control measures of other parasitic protozoa, such as *Myxobolus* spp., *Trichodina* spp., *Thelohanellus* spp. and *Sphaerospora* spp. A number of presentations examined interesting aspects of the taxonomy, ecology, phylogeography and treatment effects of chemicals extracted from Chinese medical herbs on monogeneans and cestodes. Diseases caused by trematodes, acanthocephalans and parasitic crustaceans were not reported at this conference.



The conference was filled with a warm and strong academic atmosphere. Although presentations on fish parasites represented a small portion of the contributed talks, we were pleased that there were many young scientists in attendance. These, enthused by the preponderance of parasitic pathogens in aquaculture, have joined various research teams that focus on fish parasitology.

CURRENT RESEARCH ACTIVITIES IN VARIOUS COUNTRIES

AUSTRALIA

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

The *Marine Parasitology Laboratory* at James Cook University (JCU) in Townsville has grown throughout 2013 and now comprises several PhD/Masters students working on various research projects on ornamental and tropical food fishes in collaboration with the Australian aquaculture industry.

One of the highlights for the lab this year was the 2nd Fisheries Research and Development Corporation Australasian Aquatic Animal Health Scientific Conference in Cairns in July. Dr **Kate Hutson** presented on the survival strategies of monogenean ectoparasites, whereas Dr **Terrence Miller** spoke about his current



research project on integrated parasite and disease management strategies for finfish aquaculture in tropical north Queensland. PhD student **Thane Militz**, supervised by **Kate**, presented his Honours work on the efficacy of garlic extract in managing fish ectoparasites, while Masters student **Alejandro Trujillo Gonzalez**, supervised by **Kate** and **Dr Constantin Constantinoiu** (JCU, School of Veterinary Sciences), spoke of differences in the epithelial pathology of fish microhabitats infected with the skin fluke *Neobenedenia*. PhD student **Alexander Brazenor**, supervised by **Kate** and **Guy Carton** (JCU, School of Marine and Tropical Biology), received the student prize for his paper on the effects of temperature and salinity on the life cycle of *Neobenedenia* infecting farmed barramundi.



The laboratory has welcomed many new additions recently, including two new PhD students and one Masters student. **Giana Gomes** (pictured left), supervised by **Kate** and **Terry**, is working on protozoan parasites of farmed freshwater barramundi. **Giana** has enthusiastically launched into her research work with field trips to barramundi farms and exciting preliminary molecular analyses. We also welcome new PhD student **Conni Sidabalok**, supervised by **Kate**, who will be working on isopods.

Lesley Warner/Smales (Honorary Researcher, South Australian Museum) continues her work on the Acanthocephala of marine fish. **Leslie Chisholm** (South Australian Museum) is still publishing monogenean descriptions from a survey of elasmobranchs for metazoan parasites in Malaysian and Indonesian Borneo waters in collaboration with **Janine Caira** (University of Connecticut) and **Kirsten Jensen** (Kansas State University). With the appointment of a new manager for the Arachnology Collection (which Leslie was managing part-time), **Leslie** has happily returned to running the Parasitology Collection full-time and has been busy registering a recent influx of various parasite species from fish. Leslie enjoyed the opportunity to catch up with **Mary Beverley-Burton** (pictured right), the person who originally sparked Leslie's interest in fish parasitology, during a recent trip back to Guelph, Canada.



As head of Biological Sciences at the South Australian Museum, **Ian Whittington** has been swamped with administration, but he does still find some time to continue his studies on monogeneans of fish and has two or three manuscripts underway with Dr **Graham Kearn** (University of East Anglia, UK). Dr **Marty Deveney** (South Australian Research and Development Institute) attended ISM7 in Brazil in August. He gave a keynote address entitled: "*Monogeneans in Aquaculture - the future of management*" co-authored by **Ian** and was involved in a number of other contributed papers.

CANADA

provided by David Marcogliese, David.Marcogliese@EC.GC.CA

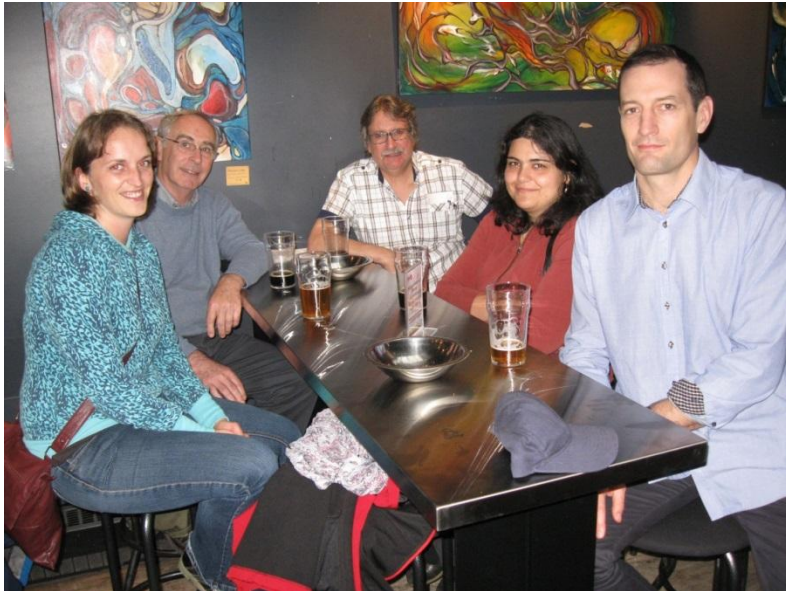
Here at the St. Lawrence Centre at Environment Canada in Montreal, we continue our work on parasites and pollution, invasive species and molecular discrimination of parasite species. This year we welcomed two new postdoctoral fellows. **Paola Braicovich** completed her PhD with **Juan Timi** at the Universidad Nacional de Mar del Plata in Argentina. She comes to us from the Consejo Nacional de Investigación Científica y Tecnológica and is working on parasites of fishes in the Athabasca River and its tributaries. **Kellyanne Boyce** recently joined us after completing her PhD at the University of Salford, Manchester, UK. She is working on the molecular discrimination of certain species of cestodes and nematodes using DNA barcodes. **Sean Locke** has moved on to another postdoctoral position at the University of Guelph, but continues to collaborate actively with us on diplostomid digeneans, among numerous other projects.

At Concordia University, **Angela Rose Lapierre** continues her PhD on the biology of *Diplostomum*. **John Forest** is looking at the effect of round goby introductions on the ecology of fish parasites in the St. Lawrence River for his PhD studies. A new addition to the laboratory, **Kathryn Gasse**, is studying the eel bladder worm *Anguillicola crassus*, a relatively new invader in Canadian waters.

This past year **David Marcogliese** and **Dan McLaughlin** welcomed a number of visiting international PhD students and postdocs to our laboratory at Concordia. **Geza Sousa**, from the State University of Maringá in Brazil, spent six months with us working on the molecular characterisation of strigeid digeneans from South American fishes. **Fred Chibwana**, from the University of Dar es Salaam in Tanzania, spent three months here using barcodes to discriminate strigeids of African fishes. **Simona Georgieva** and postdoc **Miroslava Soldanova** from the Institute of Parasitology, Academy of Sciences of the Czech Republic, spent a month with us studying the intermediate stages of fish parasites found in snails collected in the St. Lawrence River. **Geza, Simona** and **Miroslav** took advantage of their visit to attend the annual meeting of the American Society of Parasitologists in Quebec City during June. **David**

Marcogliese (pictured right) had a couple of trips to Tromsø to participate in a food web project based on Lake Takvatn and other northern lakes with an international team led by **Per-Arne Amundsen**. In March, the international team assembled for a workshop, and in August, **David** participated in fieldwork, examining parasites of three-spined sticklebacks from different Arctic lakes.





Mirka Soldanova, Dan McLaughlin, Dave Marcogliese, Simona Georgiev and Sean Locke take a break during the meeting of the American Society of Parasitologists in Quebec City.

FRANCE

provided by Jean-Lou Justine, justine@mnhn.fr

Work continues in our laboratory on fish parasites. We mounted an expedition to Thonon-les-Bains to examine the parasites collected from fish sampled from Lake Geneva. The team (pictured left to right) included **Malak Haydar, Chahrazed Rahmouni, Jean-Lou Justine, Gabriela Certad and Jean Dupouy-Camet**. The dog was not part of the team, but seemed to appreciate the smell of fresh fish. Many parasites were collected, including *Diphyllbothrium latum*, and work continues on identifying and describing the material found.



After several collecting trips to New Caledonia and Australia, **Charlotte Schoelinck** completed her PhD thesis on parasites of grouper fish entitled "*Systématique évolutive des Diplectanidae (Plathelminthes, Monogenea) parasites des Mérous des récifs coralliens (Perciformes, Serranidae)*".



Charlotte gave her final thesis presentation during September last year in the great auditorium of the Galerie de l'Évolution at the Muséum National d'Histoire Naturelle, Paris. The thesis examination committee and **Charlotte** are pictured left, including: **Tim Littlewood, Tatiana Giraud, Olivier Verneau, Dr Charlotte Schoelinck, Tine Huyse and Jean-Lou Justine**. **Charlotte** was also the proud recipient of the annual Thesis Prize awarded by the Société Française de Parasitologie.

IRAQ

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

Prof Dr **Zohair I.F.Rahemo**, at the Department of Biology, College of Science, University of Mosul, Mosul, Iraq, continues his work on monogeneans from fish, including one study, recently published in *Trends in Parasitology Research*, which examined the arrangement of the nervous system associated with the clamps in the haptor of four polyopisthocotylean species.

Two students have completed their degrees under the supervision of Prof Dr **Shamall M. A. Abdullah** at the Department of Biology, College of Education, University of Salahaddin. **Samir J. Bilal** completed his PhD thesis entitled “*Ultra- and molecular study of some cestodes and nematodes parasitizing some freshwater fishes in the Kurdistan region, Iraq*”. The study documented the occurrence of three species of cestodes, namely *Khawia armeniaca*, *Postgangesia inarmata* and *Senga* sp., and three nematode species, including, *Rhabdochona* (*Globochona*) *kurdistanensis*, *Rhabdochona* sp. and *Procamallanus siluri*. Molecular sequences for *K. armeniaca* and *P. inarmata* were produced.

Younis Sabir Abdullah (pictured right) recently completed his MSc thesis entitled “*Study on the parasites of some fishes from the Darbandikhan Lake in the Kurdistan Region, Iraq*”.

Prof. Dr. **Shamall M. A. Abdullah** continues his work on *Dactylogyrus* from the Kurdistan region in collaboration with **Kamran S. Mama**. He also recently described a new species of the nematode *Rhabdochona* in collaboration with Dr **František Moravec** and **Samir J. Bilal**

At the University of Basrah, Dr **Atheer Ali** continues his research on fish parasites in Southern Iraq. This work includes collaborations with Dr **Delane Kritsky** and **A. H. Khamees**, investigating Dactylogyridae and Gyrodactylidae from the gills of mugilid fishes. He has also described a new species of *Philometra* recently with **František Moravec** from the sin croaker *Johnius dussumieri* in the marine waters of Iraq.



MEXICO

provided by Miguel Rubio-Godoy, miguel.rubio@inecol.mx

The *Host-Parasite Interaction Lab* at the Instituto de Ecología (INECOL) studies many facets of Mexico's fish helminth fauna. **Miguel Rubio-Godoy** continues the study of gyrodactylids, collecting them from wild and cultured and feral fish, and all three sources of parasites have proved interesting. Following the infection of *Gyrodactylus cichlidarum* on farmed tilapia for one year, Miguel and collaborators **Germán Muñoz-Córdova**, **Mario Garduño-Lugo** and **Martha Salazar-Ulloa** (pictured below with Rubio), all from the Universidad Nacional Autónoma de México (UNAM), found evidence that parasite numbers are influenced by microhabitat use and not by temperature – as is usually the

case with gyrodactylids. Studying gyrodactylids collected from feral rainbow trout, Miguel and long-time collaborators **Andy Shinn**, **Giuseppe Palladini** (both University of Stirling, UK), **Mark Freeman** (University of Malaya, Malaysia) and **Adriana García-Vásquez**, ex-Stirling and ex-UNAM (but see below), characterised *G. salmonis* isolates that vary from the parasites found in Canada and the USA. The same international team found a new species of *Gyrodactylus* on endemic fish of the Mexican highlands which may have originally been a marine parasite that was caught “high and dry” when the country was uplifted.



Ulises Razo-Mendivil, a postdoc in Miguel’s lab, has been investigating trematodes infecting native fishes, and several new species were described in collaboration with **Gerardo Pérez-Ponce de León** (Instituto de Biología, UNAM), including members of the genera *Auriculostoma*, *Phyllodistomum* and *Tabascotrema*. **Ulises** also collected gyrodactylids infecting native fishes, such as *Astyanax aeneus*, *A. mexicanus* and *Heterandria bimaculata*. **Adriana García-Vásquez** recently joined Miguel’s laboratory to do a postdoc, during which she will embark on a nationwide survey to characterise *Gyrodactylus* infecting farmed tilapia and rainbow trout and wild fish (whatever she can net!) in Mexico. **Paloma Cano-Zúñiga**, a BSc student, started working with **Ulises** and has completed the life cycle of a yet undescribed trematode. She was hooked by parasites, and will do her thesis studying the helminths found in the invasive lionfish *Pterois volitans*, which has already reached the waters off Veracruz, in the Gulf of Mexico. **Ismael Guzmán-Valdivieso**, our technician, has cheerfully and consistently helped everybody in the laboratory and the field.



Finally, **Guillermo Salgado-Maldonado** (Instituto de Biología, UNAM) and **Miguel** compiled a list of invasive helminths found in freshwater fishes in Mexico; not surprisingly, they found that, of 40 invasive species, 33 are monogeneans. This will shortly appear in a book published by CONABIO (Mexico’s National Commission for the Study of Biodiversity); but, as a quick preview, we can tell you that the following five species can be considered as established invaders in the country: the monogeneans *Cichlidogyrus sclerosus*, *Dactylogyrus extensus* and *Gyrodactylus cichlidarum*; the trematode *Centrocestus formosanus*; and the cestode *Bothriocephalus acheilognathi*. Photo (left) with **Paloma Cano-Zúñiga**, **Adriana García-Vásquez**, **Miguel Rubio-Godoy** and **Ulises Razo-Mendivil**, at INECOL.

provided by Hugo H. Mejía-Madrid, hugo_mejia_madrid@ciencias.unam.mx

Hugo H. Mejía-Madrid continues his work on fish parasites at the Laboratorio de Ecología y Sistemática de Microartrópodos, Departamento de Ecología y Recursos Naturales, UNAM, México. Hugo recently published a chapter in the book "*Current Progress in Biological Research*" entitled "Parascript: parasites and historical biogeography", where he provides an overview of what has been published on the historical biogeography of parasites since its beginnings. It is clear from his chapter, that studies on fish parasites form a large part of this field. The chapter can be viewed at <http://www.intechopen.com/books/current-progress-in-biological-research/parascript-parasites-and-historical-biogeography>

Hugo presented a paper entitled "Historical biogeography of *Rhabdochona* species" at the 88th Annual Meeting of the American Society of Parasitologists and the 13th Annual Québec Molecular Parasitology Meeting held in Québec, Canada during June. As mentioned during this presentation, Hugo seeks more material of *Rhabdochona*, fixed in 95 or 96% ethanol, to include in future analyses. **Frank Moravec** has already sent very interesting specimens to Mexico without any problems. Please contact Hugo directly via e-mail for shipping instructions.

During the Quebec ASP meeting, Hugo was interviewed and video recorded by personnel of the Allen Press staff on his work in Mexico and his involvement in the ASP. This interview will eventually appear with others in a future issue of *The Journal of Parasitology*.

PORTUGAL

provided by Maria João Santos, mjsantos@fc.up.pt

The **Animal Pathology Group of CIIMAR** – CIMAR Associated Laboratory, University of Porto, headed by **Maria João Santos**, includes other senior researcher team members: **Aurélia Saraiva** (amsaraiv@fc.up.pt), **Carlos Azevedo** (azevedoc@icbas.up.pt), **Cristina Cruz** (cfcruz@fc.up.pt), **Fernanda Russel-Pinto** (russell@icbas.up.pt), **Graça Casal** (gcasal@icbas.up.pt) and **Jorge Eiras** (jceiras@fc.up.pt).

Several students and collaborators are currently working on their theses or other projects in fish Parasitology, including: **Susana Pina** (PosDoc), **Joana Costa** (PosDoc), **Francisca Cavaleiro** (PhD), **Luis Rangel** (PhD), **Sónia Rocha** (Fellowship), **Ricardo Castro** (Fellowship) and **Sílvia Martins** (BSc).

The Laboratory of Pathology investigates the pathology of freshwater and marine fish species. Some of our studies focus on Portuguese fish species, whereas others include work on some important tropical fish species, mainly from South America (Brazil) and Saudi Arabia. Thus, we have a strong collaborative research programme which was established more than two decades ago. Several projects currently running include:

- Survey of pathogenic agents of important aquaculture fish
- Parasites of marine fish from Alagoas, Brazil
- Apicomplexa and Myxozoa from seabass (*Dicentrarchus labrax*), seabream (*Sparus aurata*) and estuarine polychaetes
- Trematode life cycles using morphology and molecular tools

- Parasites of Atlantic mackerel (*Scomber scombrus* and *S. colias*), with special attention to *Anisakis* spp.

The 3-year **Project IDASSMyx** - Infection Dynamic of Aquaculture Seabass and Seabream by Myxozoa (FCOMP-01-0124-FEDER-020726 (Refª. FCT - PTDC/MAR/116838/2010)), headed by **Maria João Santos**, and collaborators (**Carlos Azevedo**, **Csaba Székely**, **Cech Gábor**, **Graça Casal**, **Susana Pina**, **Luis Rangel**, **Ricardo Severino**, **Sónia Rocha** and **Ricardo Castro**, began in April, 2012 (web page: <http://mjsantos.wix.com/idassmyx>).

The **Project AQUAIMPROV** - Sustainable Aquaculture and Animal Welfare (NORTE-07-0124-FEDER-000038) - headed by **Aires Oliva Teles**, and collaborators (**Jorge Eiras**, **Aurélia Saraiva**, **Cristina Cruz** and **Maria João Santos**), started in January, 2013 and will run for 2.5 years.

More detailed information about our previous work and publications can be seen at <http://www.ciimar.up.pt/researchgroup.php?id=PATHOLOGY>

In the laboratory of **Graça Costa** (gcosta@uma.pt), at Madeira University, research continues on the parasites of the blacktail comber, *Serranus atricauda*, collected off Madeira and the Selvagens (Savage) Islands. Several species of helminths (nematodes and cestodes) were identified in addition to a new species of microsporidian. Professor **Carlos Azevedo** and colleagues from the University of Porto are currently using electron microscopy and molecular analysis to examine this new species further. We have also been investigating the helminth parasite fauna of the oceanic horse mackerel, *Trachurus picturatus*, from off Madeira and the Canary Islands in order to select parasites as tags. This work has been done with the collaboration of Dr **Teresa Garcia Santamaria** of the IEO (Spanish Institute of Oceanography) in Tenerife.

UNITED KINGDOM

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



This year our aquarium has been invaded by crayfish (Natural Resources Wales funded PhD student **Jo James** investigating the ecosystem wide effects of these invasive species including their impact on fish), but fish parasitology remains strong at the Cardiff University School of Biosciences.

Fran Hockley (BBSRC with CASE funding from Cefas PhD student) recently published her work (*J. R. Soc. Interface*) investigating the interaction between turbulence, shear stress and longitudinal velocity on the behaviour of guppies *Poecilia reticulata* infected with *Gyrodactylus turnbullii* through open channel flume (pictured left) experiments. She is also examining how parasites affect the behaviour of infected fish in turbulent flow conditions, including the critically endangered European eel *Anguilla anguilla* infected with invasive parasites, such as

Pseudodactylogyrus spp. and *Anguillicoloides crassus*, in collaboration with colleagues at Southampton.

Jessica Stephenson (Fisheries Society of the British Isles funded PhD student) has recently completed an analysis of a long-term dataset of the prevalence of *Gyrodactylus* spp. in Trinidadian guppy populations. She has provided the first evidence of both sex- and age-specific trait-mediated indirect effects of predation pressure on the guppy-gyrodactylid system. This work has inspired many laboratory based experiments, including an investigation into the sensory ecology of this host-parasite system, and how this affects parasite transmission.

New Marie Curie Fellow Dr **Alberto Maceda-Veiga** is investigating the effects of nitrate pollution on freshwater ecosystems using the guppy-*Gyrodactylus* host-parasite system, the cladoceran *Daphnia magna* and the three-spined stickleback *Gasterosteus aculeatus* as model organisms. He focused on nitrates, because anthropogenic nitrate contamination has increased significantly in recent decades, but its effects on aquatic species are still poorly understood. As the effects of nitrate pollution can be exacerbated in the future as consequence of climate change, he is also studying the combined action of nitrate pollution and temperature increase on the immune system of sticklebacks at gene expression level. This is a collaboration with **Alex Stewart** (Leverhulme funded PhD student) and Dr **Joe Jackson** (Aberystwyth University). **Alex** will be moving to Cardiff in January, 2014 to assess the immunological responses of sticklebacks to various fish pathogens.

We were sorry to say goodbye to Dr **Catrin Williams**, who finished her PhD looking at key parasite-specific biochemical pathways in *Spironucleus vortens* that could be exploited for chemotherapy. **Catrin** has a postdoctoral RA position at the University of Reading, but may be joining us in the summer for our annual research trip to Tobago. Dr **Gabrielle Archard** (Marie Curie Fellow), who was working on how host (guppy) personality and stress responses affect susceptibility to parasites (*Gyrodactylus* spp.), is currently on maternity leave, but will continue to collaborate with us on the factors controlling disease transmission. Dr **Rachel Xavier** (FCT Fellow) has just returned from maternity leave and will continue her work assessing (i) the level of parasite spill-off between farmed and wild fish in Portugal, (ii) phylogenetic diversity of fish parasites in Borneo, and (iii) genetic diversity of gyrodactylids on the guppy system.

This year we plan to improve our communication by launching the website CRIPES (**C**ardiff **R**esearch into **I**nfection, **P**arasites and **E**cological **S**ystems) in collaboration with other epidemiological researchers within our School: Drs **Jo Lello** and **Sarah Perkins**. **Sarah** is actively involved in our current research project in Tobago, where for the last four years we have been studying the interactions between cleaning gobies (pictured right) and their clients on the reefs around Charlotteville.



As a group we have also been instrumental in supporting the British Ecological Society Special Interest Group Parasites and Pathogens - we encourage new members from those interested in the ecology and evolution of fish pathogens

(<http://www.britishecologicalsociety.org/getting-involved/special-interest-groups/parasite-and-pathogen-ecology-and-evolution/>) and hope you will join us in April, 2014 for the Parasite Ecology Sessions as part of the British Society for Parasitology meeting in Cambridge (<http://www.bsp.uk.net/news-and-events/bsp-events/bsp-spring-meeting-2014-cambridge-university/>).



We certainly had fun at last year's BSP in Bristol, which included a 3D presentation (people wearing funny glassed pictured left; photo by Sarah Reece from Edinburgh University).

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 been quite active. 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.

PhD graduate students **Eric Pulis** and **Michael Andres** are currently sorting out many of the haploporid trematodes of the world, as well as other trematodes, using morphological and molecular methods. **Eric** is also working on a variety of studies involving trematodes, including those in piscivorous birds. **Michael** is also studying specific ascaridoids worldwide, with an emphasis on those in mid-water fishes. **Juan Carrillo**, a PhD student, is investigating ciliates and non-invasive methods of detecting diseases. **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. Technicians **Jean Jovonovich**, **Ronnie Palmer**, **Janet Wright** and **Denny Hugg** are involved with several ongoing investigations. We have hosted several visitors 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, including haploporids in Latin America and apocreadiids in southeastern and northeastern United States. **Robin** is participating in most of the above mentioned studies as well as investigations on marine zoonotic parasites and on diseases and fish abnormalities.

Professor **Jerri Bartholomew's** Lab. at Oregon State University continued to combine sentinel fish exposures, polychaete sampling and water sampling to monitor *Ceratomyxa shasta* in the Klamath River (Oregon/California), where this endemic myxozoan causes enteronecrosis and mortality in juvenile salmon. These data inform a range of epidemiological and predictive models to better understand the environmental variables responsible for variation in disease-related mortality in salmonids. Researchers on the project include **Sascha Hallett, Rich Holt, Julie Alexander** (pictured right), **Michelle Jordan, Adam Ray, Stephen Atkinson** and **Gerri Buckles**. The work is funded by the US Department of the Interior, Bureau of Reclamation. **Sascha** was excited to finally attend an American Society of Parasitology annual meeting, this year in Quebec, where she advocated molecular analysis (qPCR) of water samples to generate real-time and long term spatiotemporal data on a fish parasite.



Stephen Atkinson is working with fish health specialists at the Oregon Department of Fish and Wildlife to develop an online database of pathogens of Oregon's fishes. He is also working **Eli Meyer** and bioinformaticist **Shawn O'Neil** to characterise the *C. shasta* genome. **Stephen, Jerri** and **Tamar Lotan** (University of Haifa) and colleagues have been awarded a Binational Agricultural Research Development (BARD) grant to investigate the mechanical properties of myxozoan polar capsule firing processes and ultrastructure. PhD student **Charlene Hurst** is wrapping up her studies on mixed *C. shasta* genotype infections. Master's student **Sean Roon** conducted another season of parasite surveys of wild/naturally-reared fish populations in proximity to Willamette River basin hatcheries. He also began laboratory experiments looking at the effects of multiple parasite infections on salmon survival. Three of our students graduated this past year. **Luciano Chiaramonte** completed his MSc on "*Climate warming effects on the life cycle of the parasite Ceratomyxa shasta in salmon of the Pacific Northwest*" and now is with Idaho Fish and Game. **Michelle Jordan's** Master's thesis focused on "*Hydraulic predictors and seasonal distribution of Manayunkia speciosa density in the Klamath River, CA, with implications for ceratomyxosis, a disease of salmon and trout*". **Adam Ray** defended his PhD on "*Mortality threshold for juvenile Chinook salmon in an epidemiological model of Ceratomyxa shasta*".

Jerri Bartholomew spent December, 2012 in the laboratory of Drs **Edson Adriano** and **Antônio Maia** at the Federal University of São Paulo, Pirassanunga, Brazil. She worked with graduate students in the lab and accompanied the group on a field trip to the San Francisco River to look at parasites of native fishes.

In March she spent several weeks at Huzhong Agricultural University, Wuhan China, visiting the laboratory of Dr **Gu Zemao**. Field trips to aquaculture facilities and working with graduate students were again a focus of the trip. Dr **Zemao** and Dr **Isa Zhai Yanhua** (PostDoc) then joined our group in June and will stay in our lab for a year to learn more about our myxozoan research.



Our other lab visitors this year included **Beth Okamura**, from the Natural History Museum, London. She shared her latest research on bryozoan-hosted myxozoans. Associate Professor **Isaure de Buron** (pictured left), from the College of Charleston, joined us for a field trip to the US west coast to learn the techniques we use to isolate invertebrates from sediment and examine them for myxozoan infections. **Isaure** returned in July for our biennial two-week intensive Salmon Disease Workshop.

Arik Diamant (right), Head of the National Center for Mariculture, Eilat, spent three months of his sabbatical with us. Arik helped collect aquatic annelids and dissect a range of native and non-native



fishes, including an invasive carp infested with *Myxobolus* and a rockfish that harboured a curious copepod. **María Alonso Naveiro**, a PhD student at the Instituto de Acuicultura de Torre la Sal – CSIC under the supervision of Dr **Oswaldo Palenzuela**, joined us for summer. Her study is focused on genetic characterisation of *Enteromyxum* spp. **Gema Alama Bermejo**, a postdoctoral researcher at the Institute of Parasitology, Biology Centre, Academy of Sciences of the Czech Republic, joined us in August for the next year to work on parasite proteases.

Jerri, Sascha, Stephen, Julie and **Gema** are co-authoring chapters with international colleagues for a book, *Myxozoan Evolution, Ecology and Development*, edited by **Jerri, Beth** and **Alex Gruhl**, to be released in 2014. Several contributors attended the EAFP meeting in September at Tampere, Finland (pictured from left: **Ivan Fiala, Edit Eszterbauer, Pavla Bartošová-Sojková, Ashlie Hartigan, Jerri Bartholomew, Inês Fontes, Ariadna Sitjà-Bobadilla, Steve Feist, Stephen Atkinson** and **Mansour El-Matbouli**).



We hope to see many of you at the upcoming Seventh International Symposium on Aquatic Animal Health in Portland, Oregon, USA, Aug 31 – Sept 4, 2014.

IN MEMORIAM

Professor Emeritus Louis Euzet (1923-2013)



The fish parasitology community was sadly surprised, not to say in shock, when learning of the passing of Louis Euzet on September 24, 2013. It seems that we all thought that Professor Euzet would stay among us forever, and it was difficult to believe that he had just celebrated his 90th birthday on July 27th.

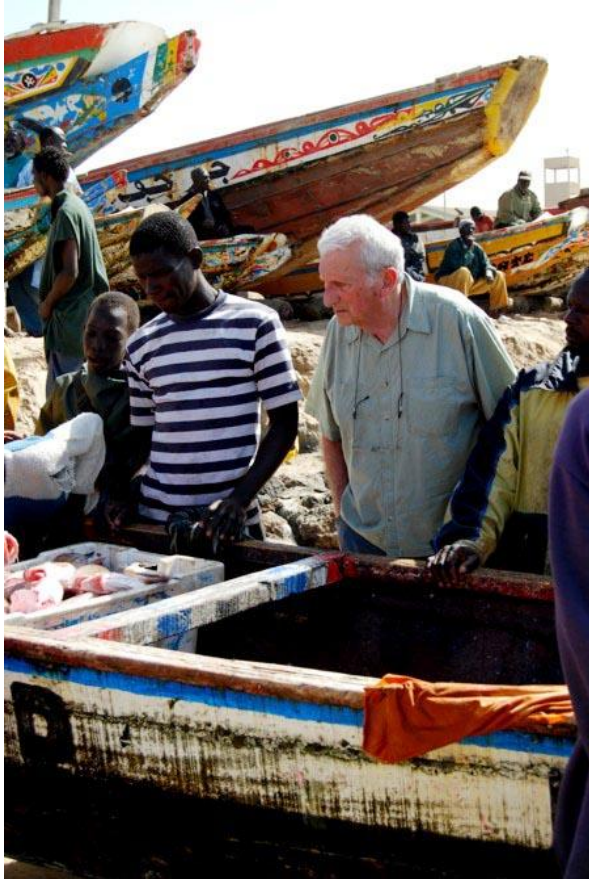
For decades, with endless energy, Professor Euzet travelled around the globe to participate in sampling trips [Africa (Benin, Cameroon, Ivory Coast, Mali, Morocco, Senegal, Tunisia, etc.), French Polynesia, India, Indonesia, Madagascar, New Caledonia, Mexico, U.S.A., etc.] or to international symposia [Czech Republic, Australia, South Africa, USA, Canada, etc.], where, despite his broken English, he was famous for being able to stir up an entire English-speaking auditorium when presenting

the results of his work or his new ideas about parasitism. His students have fond memories of his vivid, fascinating, micrograph-less lectures, where monogenean haptors were suddenly popping up from twisting hands like a magician making a rabbit appear from scarves! Professor Euzet was a charismatic parasitologist who genuinely combined deep knowledge with an extraordinary visual memory, an unleashed creativity, a never ending inquisitiveness, and a strong scientific rigor.

Louis, as almost everybody called him (except his formal students!), received his Bachelor's degree from the Université de Montpellier in Natural Sciences in 1947. He was then appointed junior lecturer at the university's "Station Zoologique" (currently known as the Station Méditerranéenne de l'Environnement Littoral) in Sète. There, he worked on his doctoral thesis on elasmobranch cestodes under the supervision of Professors Paul Mathias (Dean of the Université de Montpellier) and Jean-Georges Baer (Université de Neuchâtel, Switzerland), which he defended in 1956.

In 1959, Louis Euzet was appointed Professor at the brand new Université de Perpignan, where he stayed ten years and created the Laboratoire de Biologie Animale. Returning to the Université de Montpellier in 1969, Louis Euzet created, developed and managed the Laboratoire de Parasitologie Comparée until he retired in 1991. Inspired by his mentor, J.G. Baer, his vision was to develop the taxonomic and ecologic knowledge of animal parasites and his interests had no borders. The activities in his laboratory reflected his breadth of inquisitiveness and his fluid thoughts. Professor Euzet particularly fostered creativity and communication and his laboratory was a dynamic hub where both foreign and overseas-based French parasitologists, as well as numerous students from other research groups whether national or international often visited. It was also a place where

students were quickly initiated to eclectic discussions over lunches, mixing science fiction, Henry IV and our thoughts on monogeneans being oixenous, while being subjected to Professor Euzet's unsophisticated culinary skills (roughly limited to overcooked plain pasta) and sweet tooth (sugar to the rim of his cup of coffee because "at home Lily was watching", along with chocolate regularly brought back from Switzerland, where he spent all his vacations with his family).



Professor Emeritus since 1992, Professor Euzet continued working at the "Station Méditerranéenne de l'Environnement Littoral" in Sète every day except Sunday afternoon! He was an honorary member of the American Society of Parasitologists (1988) and of the Helminthological Society of Washington (1992). He was named Doctor *Honoris Causa* of the Université de Neuchâtel in Switzerland (1982). The French Academy of Sciences awarded him both the prestigious "Prix Trégouboff" (1987) and "Grand Prix des Sciences de la Mer" (1997). His research on Cestoda and Monogenea led to the description of numerous species (> 200 for Monogenea, > 65 for Cestoda) and the publication of more than 200 manuscripts and book chapters. He often said that "one is old when s/he has no more projects", and Professor Euzet thus never grew old. His first manuscript was published in 1951 and his last in 2012, illustrating his motto "as long as the hard drive [referring to his brain] would function, I will work." Professor Euzet worked

continually until he passed away, living up to his own prediction that he would be engaged in his studies to the very end.

During his career, Louis Euzet supervised countless Master's and Doctoral theses. Many of his former students, now professionals, work around the world and emulate their mentor by transmitting his passion about parasites to the future generations of parasitologists.

Professor Euzet will be remembered as someone who remained a simple and gentle man throughout his career, despite his erudition and notoriety, and he will be missed as an extraordinary parasitologist and as a personal mentor and colleague, who left friends wherever he went.

On behalf of his former students, friends and colleagues, our thoughts go to his wife Lily and his 'offspring'.

(This Memoriam provided by C. Combes and F. Robert (France); I. de Buron and V.A. Connors (USA); L. Neifar (Tunisia); O. Berrada Rkhami (Morocco); C. F. Bilong Bilong and A. Pariselle (Cameroon). Image 1 taken by I. de Buron at her home in the USA in 2004. Image 2 taken by A. Pariselle on the beach near Dakar in 2009).

Dr Rodney Wootten



Shortly after this Newsletter was finalised, we learned of the death of Rod Wootten who passed away on November 8, 2013 after a battle with cancer. Rod was the Deputy Director of the Institute of Aquaculture at the University of Stirling and co-editor of the Journal of Fish Diseases. He had an outstanding reputation in the area of fish parasitology and a strong commitment to the development of international student training programmes. A eulogy to Rod can be found by clicking on the following University of Stirling link:

http://www.aqua.stir.ac.uk/articles/2013/11/Dr_Rodney_Wootten

NEW BOOK

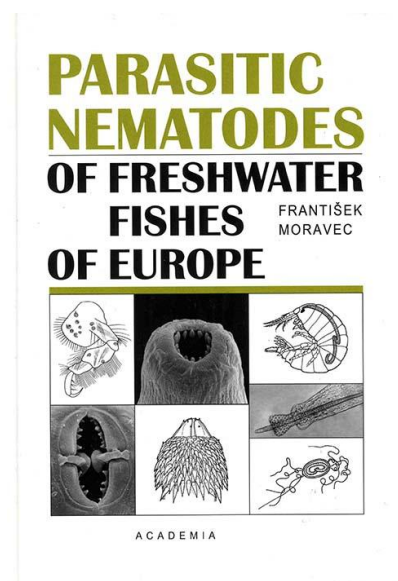
Parasitic Nematodes of Freshwater Fishes of Europe. Revised Second Edition

F. Moravec

ISBN: 978-80-200-2272-1; Published August 2013; Hardback, 601 pages; Price: 680.00 Czech crowns (= about €28 .00 or \$34.00).

Available from Academia: www.academiabooks.com

The first edition of this book was published in 1994. Twenty years on, the revised, and somewhat extended, second edition presents new knowledge about these important fish parasites, lists additional species that have been recorded from Europe and documents some previously unknown nematode life cycles. The taxonomy and systematics of the parasites and fish hosts is also updated.



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, 2014.

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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