

International Ichthyoparasitology

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Editor: Leslie Chisholm, The South Australian Museum, North Terrace, Adelaide 5000, South Australia. FAX +61 8 8207 7222; E-mail: chisholm.leslie@saugov.sa.gov.au (see Editorial Policy at end of Newsletter)

Associate Editors: David I. Gibson, Natural History Museum, Cromwell Road, London SW7 5BD, United Kingdom. Fax: +44 20 7942 5151, E-mail: dig@nhm.ac.uk; **J. Richard Arthur**, P.O. Box 1216, Barriere, British Columbia. Canada V0E 1E0, E-mail: jarthur@telus.net

Founding Editor: Kazuya Nagasawa, National Research Institute of Far Seas Fisheries, Ordo, Shimizu, Shizuoka 424, Japan. E-mail: ornatus@enyo.affrc.go.jp

Regional Representatives: **ARGENTINA**, M. Ostrowski de Nuñez (ostrowski@biolo.bg.fcen.uba.ar); **AUSTRALIA**, I. Whittington (whittington.ian@saugov.sa.gov.au); **BRAZIL**, A. Kohn (annakohn@ioc.fiocruz.br); **CANADA**, J.R. Arthur (jarthur@telus.net); **CARIBBEAN**, E. Williams (bert@rmocfis.uprm.edu); **CHILE**, M.E. Oliva (meoliva@uantof.cl); **CHINA**, Yang T. (tingbao123@163.com); **CZECH REPUBLIC**, F. Moravec (moravec@paru.cas.cz); **DENMARK**, K. Buchmann (kub@kvl.dk); **EGYPT**, R.M. El-Said Hassanine (redaaa2003@yahoo.com); **FINLAND**, E.T. Valtonen (Etvalto@byti.jyu.fi); **FRANCE**, P. Bartoli (Pierre.Bartoli@com.univ-mrs.fr); **GERMANY**, R. Hoffmann (R.Hoffmann@lrz.uni-muenchen.de); **HUNGARY**, K. Molnar (KALMAN@novell.vmi.hu); **INDIA**, L.B. Dama (southraj@yahoo.com); **IRAQ**, Z.I.F. Rahemo (zohair_rahemo@yahoo.com); **IRAN**, S. Shamsi (shoo71@hotmail.com); **ISRAEL**, I. Paperna (paperna@agri.huji.ac.il); **ITALY**, L. Paggi (paggi@axrma.uniroma1.it); **JAPAN**, K. Nagasawa (ornatus@enyo.affrc.go.jp); **KOREA**, Kim Jeong-Ho (jhkim70@kangnung.ac.kr); **KENYA**, P. Aloo (alooopenina@yahoo.com); **MALAYSIA**, L.H.S. Lim (susan@um.edu.my); **MEXICO**, S. Monks (smonks@uaeh.reduaeh.mx); **NEW ZEALAND**, B. Wesney (no e-mail); **NORWAY**, K.I. Andersen (karin.andersen@toyen.uio.no); **PERU**, J. Iannacone (aphia2005@yahoo.com); **POLAND**, W. Piasecki (piasecki@fish.ar.szczecin.pl); **PORTUGAL**, M.J. Santos (mjsantos@fc.up.pt); **RUSSIA**, O.N. Pugachev (pon@zisp.spb.su); **SOUTH AFRICA**, J.G. Van As (VANASJG@SCI.UOVS.AC.ZA); **SPAIN**, J.A. Raga (TONI.RAGA@uv.es); **SWEDEN**, J. Thulin (jan.thulin@fiskeriverket.se); **SWITZERLAND**, T. Wahli (no e-mail); **THAILAND**, K. Supamattaya (kidchakan.s@psu.ac.th); **TURKEY**, N. Saglam (nsaglam@firat.edu.tr); **UKRAINE**, A.V. Gaevskaya (alviga@ibss.iuf.net); **UK**, R.A. Bray (r.bray@nhm.ac.uk); **USA**, R.M. Overstreet (robin.overstreet@usm.edu); **VIETNAM**, Tran Thi Binh (tranthibinhs@yahoo.com).

Dr Jeong-Ho Kim, the regional representative of Korea has moved. His new contact details are: Faculty of Marine Bioscience & Technology, Kangnung National University, Kangnung City, Kangwon-do, 210-702, KOREA, e-mail: jhkim70@kangnung.ac.kr

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EDITORIAL

Ichthyoparasitologists have had a busy year doing research and attending meetings. I welcome 3 new Regional Representatives; for Peru, **Dr José Iannacone** Laboratorio de Ecofisiología, Área de Biodiversidad Animal, Facultad de Ciencias Naturales y Matemáticas, Universidad Nacional Federico Villarreal. Calle San Marcos 383, Lima 21, Peru; for Turkey, **Dr Naim Saglam** from the Firat University, Fisheries Faculty, Department of Fisheries and Fish Diseases, 23119, Elazığ-Turkey; for Vietnam, **Dr Tran Thi Binh**, Parasitology Department, Institute of Ecology and Biological Resources, Vietnamese Academy of Science and Technology, 18 Hoang Quoc Viet, Nghiado, Caugiay, Hanoi, Vietnam.

Sadly, 2005 saw the passing of Boris Lebedev, a notable monogenean researcher (see below).

Anyone wishing to contribute to the next issue of the Newsletter (Number 14) should note that the deadline date for submission is **November 15, 2006**. 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.dsl.pipex.com/newsletter/>

ANNOUNCEMENTS

Research Associate (Marie Curie Fellow) in experimental fish parasitology at the University of Valencia (Spain)



The position is available at the Marine Zoology Unit of the Cavanilles Institute of Biodiversity and Evolutionary Biology (www.uv.es/cavanilles/zoomarin).



You will assist to manage and supervise the project *Parasite Pathogens in New Species of Mediterranean Aquaculture: an Experimental Approach*, a Marie Curie Action for the Transfer of Knowledge, funded by EC's 6th Framework Programme. The main objectives of the project are to elucidate the life cycle of blood flukes (Sanguinicolidae) and monogeneans

of finfish under aquaculture conditions and to assess preliminary techniques of prophylaxis and control of these parasites. Research will be carried out at the Experimental Aquaculture Plant of the University of Valencia. This first-class research facility occupies 500 m², and contains 124 tanks holding about 110,000 L, with a modular system for treatment, filtering and sterilization of water (scsie.uv.es/1004/acuarios/acuarios.html).

The position is offered for 12 months, preferably divided into 2–3 month secondments along the duration of the project (from March 2006 to September 2008), although the eventual number and extension of secondments are negotiable. Your duties will include designing, initiating, monitoring progress of research and assisting the project's coordinator with reporting to the EC. You will also organise and provide training in broader issues, particularly in ethical and safety matters related to experimental aquaculture facilities and management and logistics of such facilities. The fellowship is given as a flat stipend of 31,390 €, plus a health insurance and travel allowances, and is compatible with current employment at your home institution. You should have over 10 years of fulltime postgraduate experience and an excellent publication record in experimental fish parasitology, parasite life cycles and/or parasites relevant to aquaculture. You will also have experience with project management and organisation of relevant transfer-of-knowledge activities. Nationality of an EU Member State or an Associated State is not a requirement for this fellowship.

Applications in triplicate must include a statement of your research and transfer-of-knowledge plans, your CV, copies of up to 5 selected publications and the names and addresses of 2 referees. Address applications and further enquiries to:

Dr Juan Antonio Balbuena
Cavanilles Institute of Biodiversity and Evolutionary Biology
University of Valencia
P.O. Box 22085, E-46071 Valencia, Spain
Tel.: +34 96 354 3658, Fax: +34 96 354 3733
E-mail: zoomar@uv.es

We regret that applications cannot be made by e-mail or fax.

Closing date: February 1, 2006.

The University of Valencia is an equal opportunities employer and welcomes applications from suitably qualified people from all sections of the community. Female candidates in particular are encouraged to apply.

ICOPA XI

The British Society for Parasitology is pleased to announce the call for abstracts for the **International Congress of Parasitology XI** that we are hosting in Glasgow, Scotland, August 6–11, 2006. A comprehensive programme of symposia, sessions and workshops is being organised and preliminary details of topics and speakers are now published. Further sessions will be arranged in response to submitted abstracts. Please visit the ICOPA website (<http://www.icopaxi.org/>) for further information, abstract submission information and registration forms.

Deadline for abstract submission: **January 15, 2006**
Deadline for early registration: **March 17, 2006**



ICOPA XI
11th International Congress of Parasitology
6th - 11th August 2006 SECC, GLASGOW, SCOTLAND

MEETING REPORTS

FIFTH INTERNATIONAL SYMPOSIUM ON MONOGENEA

provided by Delane Kritsky, kritdela@isu.edu



The 5th International Symposium on Monogenea (ISM5), held at Sun Yat-Sen University, Guangzhou, China, on August 8-12, 2005, was an outstanding success. It provided investigators from throughout the world an unique opportunity to present and discuss their research and

to exchange new ideas concerning various aspects of the biology of monogenean parasites. More than 85 participants from 26 countries presented 8 invited papers, 64 regular research papers, and 37 posters dealing with various aspects of the biology of monogenean parasites, which filled the 4-day program of paper presentations.



The symposium began on August 8 with some brief opening remarks by **Yang Tingbao**, Chair of the Local Organising Committee, and **David Gibson**, Chair of the International Organising Committee. A moment of silence was held in memory of our colleagues, **Jack Llewellyn** and **Boris Lebedev**, who passed away since ISM4. **Richard Tinsley** began the formal presentations with his invited paper on the role of research on monogenean parasites, during which he stressed that monogenean parasites provide natural host-parasite models for study of fundamental concepts in parasitology. Many of the other papers that, and following days, stressed evolutionary history, development and biogeography of the group. For example, invited reviews included discussions on the morphological and phylogenetic aspects of the coexistence of congeneric dactylogyrids on their hosts by **Milan Gelnar** (and his coworkers), the evolutionary history and development of the viviparous Gyrodactylidae by **Delane Kritsky**, the antiparasitic response in fish and the immune-evading mechanisms of monogenean parasites by **Kurt Buchmann**, and monogenean adaptations to the parasite life cycle by **Susan Lim**. Classification, taxonomy, and parasite diversity also comprised significant portions of the program, with **Jaakko Lumme's** invited paper including a proposal for possible use of a DNA bar code for identification and cataloging of gyrodactylids, **Jean-Lou Justine's** paper presenting the richness of monogenean diversity in New Caledonia, and **Ian Whittington's** invited presentation dealing with the taxonomy of the Entobdellinae (Capsalidae). Sessions for

regular papers included topics on gyrodactylids, immunity, evolution and phylogeny, faunistics, systematics, aquaculture, techniques, and general biology of monogenean parasites. Topics of the poster session also had the same varied areas of interest.

Awards for “Best Student Oral Presentations” were awarded to **Vanessa Glennon** (pictured right receiving award from David Gibson), University of Adelaide, Australia (first prize), **Tan Wooi-Boon**, University of Malaya, Malaysia (second prize) and **Wong Wey-Lim**, University of Malaya, Malaysia (third prize). **Martina Pecinkova**, Masaryk University, Czech Republic, received the prize for “Best Student Poster.” **Marcus Domingues**, University of Sao Paulo, Brazil, and **Paco Montero**, University of Barcelona, Spain, received first and second prizes for “Best Oral Presentation” by a young researcher, respectively.



Two important tools for those conducting research on monogenean parasites were presented that (in my opinion) deserve special mention because of their potential importance to all workers in the field. **Paolo Galli** offered a technique to prepare whole-mount monogenean specimens for 3-dimensional imaging which could provide improved understanding of the morphology and function of the complex sclerites comprising the monogenean copulatory apparatus and haptor armament. Although not included as an abstract in the program, **Andy Shinn** introduced a new database for gyrodactylids that should greatly assist future workers in identifying species of *Gyrodactylus*. The database, available at www.gyrodb.net, remains under construction but already contains much important and useful information concerning the group.



The ISM5 Organising Committee also provided an outstanding social calendar for participants and their accompanying persons. Throughout the symposium, daily tours to local sites of interest, hosted and guided by some outstanding students from Sun Yat-Sen University, were available to all. On Wednesday, symposium participants were honored with a full day sightseeing tour of Foshan, a nearby historical city, which was followed by an evening meal and night cruise on the Pearl River at Guangzhou. The symposium concluded on Friday with one of the most outstanding banquets this “old man” has attended, during which time we all were exposed to Chinese cuisine, cultural costume, and dance. However, it took my wife (**Marlene**; pictured left with conference organiser Yang Tingbao), Tingbao, and **Branko Radujkovic** along with some loud western music to eventually get the floor filled with dancers.

I shouldn't end this little news note without thanking and congratulating Tingbao and his committee and volunteers (**Zhao-Rong Lun, Wen Chen, An-Xing Li, Pin Nie, Hong Pang, Yuan-Yi Yan, Wen-Qin Zhang, Guang-Zhi Ma, Xue-Juan Ding, Ling-Yan Liu, Jun Pan, Jun-Yi Lu, Yuan Sun, Ying-Zhu Rao, Wang-Jun Zhang, Hong-Yan Sun, Jin Cai, Bo Wang, Bi-Jian Zeng, Shao-Yin Yuan and De-hua Lai**) for all of the work it must have taken to organise and conduct this highly successful and enjoyable symposium. ISM5 will be a “hard act” to follow (as they all have been previously). Good luck to South Africa as we look forward to ISM6 in 2009!

MYXOZOAN WORKSHOP

provided by Jerri Bartholomew, bartholj@science.oregonstate.edu and Arik Diamant, diamant@agri.huji.ac.il



Ichthyopathologists from all over the world participated in the EAFP's 12th International Conference in September 2005 in Copenhagen, Denmark. There were numerous presentations and round-table discussions of interest to fish parasitologists. For the first time, an entire day (September 14, 2005) was

devoted to Myxozoa. The special gathering included 2 sessions of oral presentations and a myxozoan poster session, all of which provided an updated overview on contemporary topics of myxozoan research. The oral sessions included 17 presentations, encompassing a diverse range of Myxozoan research topics: evolutionary ecology of malacosporeans, studies on life cycles, molecular genetics and phylogeny, ultrastructure, host fish immune responses and novel diagnostic assay methods.

A total of 20 posters dealing with various myxozoan topics were presented in the poster session. These included among others, matching myxosporeans and actinosporeans (prize winning poster!), construction of a cDNA library from triactinomyxon spores, correlating *Tubifex* genotypes with propagation of *Myxobolus cerebralis* as a risk assessment tool for whirling disease, and biochemical characterisation of glycan-epitopes in a myxozoan.



At the poster session (left to right): **Ivan Fiala**, **Jerri Bartholomew**, **Mansour El-Matbouli**.

A round-table discussion that dealt with various current topics, new tools and approaches with the objective of stimulating new areas of Myxozoan research and encouraging international collaboration, concluded the day. The first topic dealt with the idea of creating Tissue

Microarrays (TMAs) of myxozoan parasites. This concept deals with production of serial paraffin histology sections of specimens of special interest which can be processed for histochemistry, immunocytochemistry, ISH, and was presented by **Ariadna Sitja-Bobadilla** (CSIC, Spain). The second topic outlined a suggested protocol for standardised preparation and preservation of actinosporean spore samples, and was presented by **Stephen Atkinson** and **Sascha Hallett** (OSU, USA). Finally standardisation of procedures for obtaining and analysing SSU rDNA sequences with the ultimate goal of a complete revision of the systematics of the Myxozoa was summarised by **Oswaldo Palenzuela** (CSIC, Spain).

There was even time for talking about Myxozoa during the coffee breaks (left to right): Jerri Bartholomew, Sascha Hallett, Stephen Atkinson, Oswaldo Palenzuela, **Shira Perlberg**, **Arik Diamant** and Aridana Sitja-Bobadilla.



For more information, see the 2005 end-of-the-year issue of the EAFP Bulletin and visit the **Myxozoa website** www.myxozoa.org.

FIFTH INTERNATIONAL WORKSHOP ON CESTODE SYSTEMATICS AND PHYLOGENY

provided by Janine Caira, janine.caira@uconn.edu, Tomáš Scholz, tscholz@paru.cas.cz
and Boyko Georgiev, boykog@netbg.com

Nearly 70 cestode specialists from 21 countries converged on the Institute of Parasitology at the Academy of Sciences of the Czech Republic in České Budějovice this past July for the Fifth International Workshop on Cestode Systematics and Phylogeny. The meeting consisted of a variety of invited and contributed papers, punctuated by lively discussions focused on specific issues in cestode systematics and terminology, and hosted by the team of T. Scholz.

This tradition of the tri-annual gathering of cestode systematists from around the world to focus on specific issues in the systematics and phylogeny of tapeworms was initiated by **Jean Mariaux** (pictured right) in 1993 in Switzerland, at the Natural History Museum of Geneva. Subsequent workshops have been held at the University of Nebraska in Lincoln, Nebraska (1996), at the Central Laboratory of General Ecology in Sofia, Bulgaria (1999), and at the University of Connecticut in Storrs, Connecticut (2002). These workshops have come to play an important role in providing an opportunity for the global community of cestode researchers to work together to move the field of cestodology forward in a somewhat unified direction.



Among the primary goals of the workshop this past summer was the finalisation of a discussion, begun at the previous workshop, of a unified terminology for cestode microtriches. The second goal was initiation of discussion towards the development of a simplified and standardised terminology for embryonic envelopes. Significant progress was made towards achieving both of these goals.



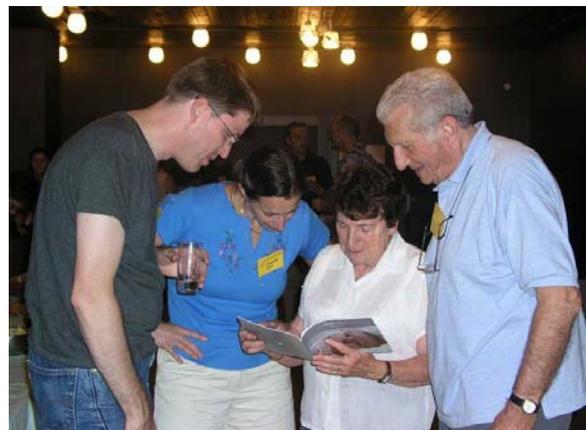
Pictured above left to right:
Boyko Georgiev, Tim Littlewood, Vasyl Tkach
and **Vladimir Gulyaev**

Another focus of the workshop was the articulation of current thoughts on the classification and phylogenetic relationships of the cestode orders, emphasising results of work conducted since the last workshop. The audience was treated to comprehensive presentations on 2 of the cestode orders parasitising elasmobranchs by **H. Palm** and **K. Jensen** who introduced their recently published monographs on the Trypanorhyncha and Lecaniccephalidea. In addition, molecular and morphological work has led to notable progress with respect to the understanding of the phylogenetic relationships of the Proteocephalidea (**A. de Chambrier** and co-workers), Tetraphyllidea (**J. Caira** and co-workers), Pseudophyllidea (**R. Kuchta, R. Bray & J. Brabec**), Trypanorhyncha (**I. Beveridge** and co-workers), Diphyllidea (**A. Lipshitz & V. Ivanov**) and Cyclophyllidea. For the first time, a phylogenetic

hypothesis for the Caryophyllidea was presented (**V. Hanzelová** and co-workers). Newly obtained data confirmed paraphyly of pseudophyllideans that consist of 2 unrelated groups and polyphyly of the Tetracyphillidea.

Discussions of the current status of molecular data applied to questions of cestode phylogenetic relationships were prompted by a number of papers presenting results of recent molecular work. As is true for many metazoan taxa, a series of nuclear (e.g., *Ef-1 α* , and 18S, 28S, 5.8S, ITS1 and ITS2 ribosomal RNA) and mitochondrial (e.g., 16S rRNA) regions of the genome have been examined. The limitations of these sequence data and the exploration of potentially promising additional genes (e.g., COI) were discussed. For example, the current lack of resolution afforded by molecular data regarding the phylogenetic relationships among the most basal cestode groups is frustrating efforts to understand some critical aspects of cestode evolution, including strobilisation, proglottisation and complex life histories.

The International Cestode Workshop was preceded by a 2-day meeting of the Global Cestode Database working group. The Global Cestode Database project, coordinated by Janine Caira (pictured right in blue shirt with **Peter Olson** and **Jacqueline** and **Louis Euzet**) with funds from the National Science Foundation's PEET (Partnership for Enhancing Expertise in Taxonomy) program, has as its primary goal providing on-line access to taxonomic information and original descriptions of all cestode species and genera by 2007. Over the course of the weekend this group, whose membership consists of an international suite of taxonomic authorities in each of the major cestode lineages, generated standardised text for each cestode order (or in the case of the speciose Cyclophyllidea, each family) to appear on the project website (see www.tapeworms.org) and developed plans for the final phase of the project.



One of the most positive aspects of the workshop was the participation of a remarkable number of active and enthusiastic students and young research scientists (almost 50% of the attendees) from around the world. This encouraging fact bodes well for the future of cestode systematics and its continued tradition of international collaboration.

SIXTH INTERNATIONAL ACANTHOCEPHALAN WORKSHOP

provided by Scott Monks, smonks@uaeh.reduaeh.mx

Every four years those working on acanthocephalans gather at an international workshop, and this year the sixth meeting was held at the Chamela Biological Field Station, Jalisco, México November 7–12, 2005. The field station is part of the Universidad Nacional Autónoma de México (UNAM) and **Guillermo Salgado-Maldonado** (pictured right) (Laboratorio de Helmintología, Instituto de Biología, Universidad Nacional Autónoma de México [IBUNAM]) was the official host for the meeting.





As always, the meeting drew a fine number of participants that are actively working on the biology of the Acanthocephala. Not all the attendees work on species that parasitise fish and only the presentations of those related to the newsletter will be reported here. The list of participants (in no particular order) includes many familiar names: **Frantisek Moravec** (Institute of Parasitology,

Academy of Sciences of the Czech Republic, Czech Republic); **Isaure de Buron** (College of Charleston, Charleston, South Carolina, USA); **Bahram Dezfuli** (Department of Biology, University of Ferrara, Italy); **Brent Nickol** and **Laura Duclos** (University of Nebraska-Lincoln, Lincoln, Nebraska, USA); **Omar Amin** (Parasitology Center, Inc., Tempe, Arizona, USA); **David Bolette** (University of Pittsburgh, Pennsylvania, USA); **T. Sinisalo** and **E. Tellervo Valtonen** (University of Jyväskylä, Finland); **Guillermo Salgado-Maldonado**, **Alejandro Cruz-Reyes** and **Martín García-Varela** (Instituto de Biología, Universidad Nacional Autónoma de México, D.F., México); **Griselda Pulido-Flores** and **Scott Monks** (Universidad Autónoma del Estado de Hidalgo, Pachuca, Hidalgo, México); **Dennis Richardson** (Department of Biology, Quinnipiac University, Connecticut, USA); **Liliana Semenas** (Universidad Nacional del Comahue, Bariloche, Argentina); and, **Lesley Smales** (Central Queensland University, Rockhampton, Queensland, Australia). Unfortunately some, including David Crompton, Clive Kennedy, Jimmy Chubb, Berndt Sures, Horst Taraschewski and Robert Konecny, could not attend because of other commitments.

Presentations of particular importance to those who study helminths of fish included: the use of isotopes to identify dietary components of seals (Sinisalo); a study of the nervous system of *Pomphorhynchus laevis* (Dezfuli); unusual structural features of acanthocephalans (Amin); phylogenetic studies of acanthocephalans (García-Varela); biodiversity of acanthocephalans of marine fishes (Pulido-Flores); acanthocephalans of freshwater fish of Argentina (Semenas); acanthocephalans of central European fish (Moravec); ecological relationships of acanthocephalans in fish from Chetumal, Mexico (Monks); and, acanthocephalans of freshwater fish of Mexico (Salgado-Maldonado). The complete titles and abstracts are available from Scott Monks (smonks@uaeh.edu.mx).

The workshop included open discussion periods, walking tours of the Cuitzmalá Reserve of the Biosphere in which the biological station is located, and, of course, time to catch up on all the news from friends attending the workshop. As well, attendees were treated to several excellent beach-side seafood dinners and boat trip to an island in the nearby Chamela Bay.



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At the close of the meeting it was decided that Dennis Richardson (Dennis.Richardson@quinnipiac.edu) will host the 2009 workshop, possibly at a field

station near the university in Connecticut where he teaches. Guillermo Salgado-Maldonado was an excellent host, and all attendees enjoyed their time at the workshop, the facilities at the biological station, and the delicious food prepared by the staff of the field station.

UPDATES

WESTHER

A multidisciplinary approach to the identification of herring (*Clupea harengus* L.) stock components west of the British Isles using biological tags and genetic markers

provided by Ken Mackenzie, k.mackenzie@abdn.ac.uk

This EC-funded project on stock identification of herring (*Clupea harengus* L.) to the west of the British Isles, described in Newsletters 11 and 12, is now approaching completion. The final meeting of partners will take place at the University of Algarve, Faro, Portugal in December 2005, when the Final Report will be prepared. The use of parasites as biological tags has enabled the parasitology group in this multidisciplinary project to draw up several working hypotheses which will be compared with results from genetic and other studies. One interesting result is the record of herring as a new host for the adult digenean *Pronoprymna ventricosa* (Rudolphi, 1819), found in the pyloric caeca of herring from the Irish Sea.

CURRENT RESEARCH ACTIVITIES IN VARIOUS COUNTRIES

AUSTRALIA

provided by Ian Whittington, whittington.ian@saugov.sa.gov.au

Many Australians in fish parasitology attended a conference somewhere during 2005. Nationally and internationally, there were plenty to choose. In Australia, the Fisheries Research & Development Corporation (FRDC), an agency with strong links to industry who fund applied research on planning, managing and developing fisheries, held an Aquatic Animal Health Subprogram Scientific Conference in Cairns, Queensland (July 26–28, 2005). With Australia's fisheries and aquaculture representing the fastest growing sectors of primary industry, there is much activity to ensure our aquatic animal sector remains free of diseases known elsewhere. Of course we also need to understand our unique and poorly studied endemic pathogens. The mission of the Aquatic Animal Health Program is 'to provide leadership to aquatic animal health research and development and its adoption in Australia'. For finfish, the Cairns conference included 3 keynote lectures from **Professor Chris Secombes** (University of Aberdeen, U.K.) on the cytokine network of fish, functional genomic approaches to study host-pathogen interactions and antibacterial peptides in fish. The 55 participants also heard presentations on bacteriology, amoebic gill diseases (various presentations from the group at the University of Tasmania-Launceston [UTas] led by **Barbara Nowak**), parasites of economically important finfish species such as tuna (*Thunnus maccoyii*) and yellowtail kingfish (*Seriola lalandi*), pathophysiology of fish diseases (work by **Mark Powell** and associates [UTas]), finfish viruses and health resources, including development of fish cell lines. For more

details, contact **Mark Crane** (mark.crane@csiro.au) or **Joanne Slater** (joanne.slater@csiro.au).

Ian Beveridge represented Australia at the 5th International Workshop on Cestode Systematics & Phylogeny during a tour of several museums in European cities. Other Australian ichthyoparasitologists travelled to Copenhagen to attend the EAFP meeting. Presentations included Australian perspectives on aquatic animal welfare and ethics (Mark Powell), amoebic gill disease (Barbara Nowak, Mark Powell and collaborators) and tuna health (**Nathan Bott** from Tuna Pathogen Diagnostics, SARDI, South Australia; **Brian Jones**, Department of Fisheries, Western Australia; Barbara Nowak) including a presentation by PhD student **Hamish Aiken** (UTas) on the blood fluke, *Cardicola forsteri* of *T. maccoyii*.



Those that prefer to work on parasites of fish that have less complex but equally intriguing life-cycles attended the 5th International Symposium on Monogenea in Guangzhou, China. The group from The University of Adelaide and South Australian Museum in Adelaide, South Australia were named 'Team Australia' (pictured left to right: Lizzie Perkins, Ian Whittington, Allan Mooney, Leslie Chisholm, Vanessa Glennon) by **Andy Shinn** and delivered a total of 9 presentations. **Leslie Chisholm** and **Ian Whittington** were proud of their students who attended ISM5.

Lizzie Perkins, an Honours student, presented her work on the phylogeny of capsalids using 28S rDNA which has since been extended into a multigene phylogeny.

Allan Mooney gave a 30 minute presentation of his studies on the life-cycle parameters for *Zeuxapta seriolae* infecting *S. lalandi* in South Australia. **Vanessa Glennon** was awarded Best Student Oral Presentation (pictured right celebrating her win with **Thomas Lindenstrøm** and **Kurt Buchmann**) for her paper on different hatching and invasion strategies by 3 Monogenea species of the rhinobatid, *Trygonorrhina fasciata*.



Leslie presented current work on why capsaline Monogenea require revision and Ian presented 3 papers on entobdelline Monogenea, monogeneans in aquaculture and continuing studies on the infamous pathogen, *Neobenedenia melleni*.

The national conference of the Australian Society for Parasitology ran concurrently with the 20th International Conference of the World Association for the Advancement of Veterinary Parasitology held in Christchurch, New Zealand, October 2005. One session on Parasites in Aquatic Environments included histopathology of *Kudoa neurophila* of *Latris lineata* (by PhD student **Geoff Grossel**, UTas), life cycle parameters of *Benedenia seriolae* from *S. lalandi* (by Honours student **Julia Lackenby** from the University of Adelaide group), egg-laying strategies in *Heteraxine heterocerca* and *Benedenia seriolae* (Monogenea) from *S. quinqueradiata* in Japanese aquaculture (by PhD student Allan Mooney from the University of Adelaide group, use of molecular markers (16S rDNA) to identify cymothoid isopods (by PhD student, **Connor Jones** from the University of Queensland [UQ], Brisbane), component communities of metazoan ecto- and endoparasites from labrids (by PhD student, **Gabriela Muñoz**, UQ) and nuclear (ITS2

rDNA) and mitochondrial (ND1) sequence diversity among gyliuchenid trematodes in the Indo-West Pacific (by **Kathryn Hall**, formerly of UQ and now a postdoctoral fellow in the Laboratory of Fish Diseases at The University of Tokyo).

When not attending conferences, the students in the Marine Parasitology Group at the University of Adelaide/South Australian Museum have been very busy doing research. Four PhD students (**Kate Hutson**, Allan Mooney, **David Schmarr** and **Rissa Williams**), have almost completed their field studies (see Newsletter 12 for overview of their projects) and are busily writing up their theses which are all due for completion in 2006. Needless to say Ian will be very busy reading thesis drafts! PhD student Vanessa Glennon is



continuing her experimental work on the parasites of the southern fiddler ray. Julia Lackenby completed her Honours in May 2005 and is hoping to start her PhD with **Marshall Lightowlers** in Melbourne; unfortunately this move means she is leaving the world of fish parasites. Lizzie Perkins recently completed her Honours project (First Class) and hopes to continue her work in 2006 as a PhD student extending her studies on the molecular systematics of the Capsalidae. Brad Smith (pictured left) was employed at various times throughout 2005 to assist in the tagging program of yellowtail kingfish in Spencer Gulf, South Australia and to help others in the group with their research. He was particularly chuffed to have the monogenean, *Dendromonocotyle bradsmithi*, which he found on the dorsal surface of local southern eagle rays, named after him.

Sadly, since the last update, the Marine Parasitology Group has said goodbye to **Ingo Ernst** and **Clinton Chambers** who both moved to Canberra for government fishery policy positions.

INDIA

provided by Laxmikant B. Dama, southraj@yahoo.com

In September 2005, parasitologists in India had the opportunity to attend the International Transfer of Technology Initiative Workshop on Parasitology and Genotoxicity in Sustainable Aquaculture held at University of Allahabad, Allahabad. In October 2005, the Seventh National Congress of Parasitology sponsored by Indian Society for Parasitology was held in the beautiful city of Dibrugarh at the Regional Medical Research Centre, Dibrugarh, Assam.

The Parasitology Research Laboratory of the Department of Zoology, Dr. B.A. Marathwada University, Auranagbad includes: **Dr B.V Jadhav**, **Dr C.J. Hiware**, **Dr S.R. Nikam** and **Dr Wankhede**. Their research interests include the taxonomy and ultrastructure of helminth parasites of marine and freshwater fish.

Dr Jadhav is continuing his work with parasites of freshwater fish in Maharashtra, with a major focus on cestodes of the genera *Senga*, *Lytocestus*, *Gangesia* and *Circumonchobothrium*. In his lab he maintains a database and specimens for reference. He is currently working on a UGC funded major research project entitled 'Faunal diversity of helminth parasites of freshwater fishes from Maharashtra State, India'. In this study

they are assessing the faunal diversity of helminth parasites of freshwater fishes from different localities. This project also introduces newcomers to the fundamentals of diagnostic procedures including how to use a microscope to identify parasites by using newly designed protocols. With descriptions of common parasites as a reference, the experienced fish culturist or veterinarian can monitor fish parasites and gain an understanding a faunal biodiversity of helminth parasites associated with freshwater fishes. Dr Jadhav has also recently published a book on Indian nematodes

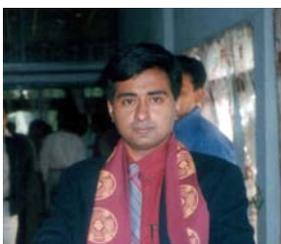


Dr Dama Laxmikant (pictured left) (Post Graduate Department of Zoology, D.B.F. Dayanand College of Arts and Science, Solapur) is currently working on a UGC funded major research project entitled 'Faunal diversity of helminth parasites of freshwater fishes from Maharashtra State, India'. This includes the identification of new helminths and establishing protocols for assessing their biodiversity by determining their prevalence, mean abundance and mean intensity. He is establishing a quality control

monitoring program, which includes, field notes, sample collection and processing forms, procedures for verifying taxonomic identifications, data screening and database management. He is also determining the effectiveness of many anthelmintic drugs isolated from natural products and, in particular, the effect of Napthoquinones on helminths. He was recently made a Fellow of the Indian Association of Aquatic Biology (F.I.I.A.B). He is a life member of the Indian Society for Parasitology, the Indian Fisheries Association, (CIFE) Mumbai, the Society of Fisheries Technologists, (CIFT) Cochin and the Indian Association of Aquatic Biology, Hyderabad.

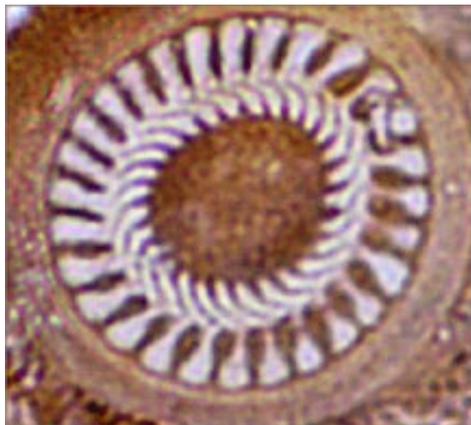
Dr H.K. Bhagwan (Post Graduate Department of Zoology, S.M.D.M. College, Kallam) is studying cestode parasites from the west coast of India including Ratnagiri, Mumbai and Alibagh. He is focusing on the orders Tetraphyllidea, Lecanicephalidea and Trypanarhyncha. He has so far identified *Echeneibothrium trygoni*, *Phyllobothrium gracile*, *P. chiloscyll*, *P. foliatum*, *P. radioductum*, *Acanthobothrium guptai*, *A. ijimai*, *Pedibothrium zugei*, *Sephenicephalum dnyandevi*, *Tylocephalum aligensis*, *Balanobothrium carchariasae*, *Tetragonocephalum meenae*, *Nybelinia pintneri* and *Gymnorhynchus thapari*. More recently is surveying helminths from freshwater fish from Manjra and Dhanegaon Dam. He was recently made a Fellow of Life Sciences (Society of Life Science) and attended the International Transfer of Technology Initiative Workshop on Parasitology and Genotoxicity in Sustainable Aquaculture.

provided by Amlan Kumar Mitra, amlan_mitra@hotmail.com



Amlan Kumar Mitra (pictured left) is now associated with the Parasitology Laboratory, Department of Zoology, University of Kalyani, Kalyani 741235, West Bengal, India. His main research area is the study of the biodiversity of parasitic trichodinid ciliophorans of fish in the state of West Bengal. The study started in 1997 as part of a PhD under the supervision of **Professor D.P. Haldar** (since retired) who received training on this complex group from **Dr Jiri**

Lom of the Czech Republic. Amlan Kumar Mitra also acknowledges **Prof. Linda Basson** of University of Free State, South Africa who helped considerably in some crucial moments of his research career and provided updated knowledge on parasitic trichodinids. The main focus of his research activities is the study of the biodiversity of trichodinid ciliophorans of all families of cultured and wild fishes of West Bengal and to determine the impact of trichodinids on fish health.



Fisheries development represents a vital sector in West Bengal for rural uplift, which ultimately aims to improve the socioeconomic conditions of the fishermen in addition to providing a cheaper source of animal protein. However, fishermen are not aware of the existence and pathogenic effect of trichodinids, leading to the mass mortality of the fishes due to the disease trichodiniasis. Our research has identified various groups of trichodinid ciliophorans (pictured left) not only from cultured fishes but also from the wild fishes inhabiting the Ganges River, Churni River, Ichamati River, Tista River and the Matla River. Some

of these fish are gradually becoming extinct in the water bodies. We will be running future awareness programs, with the help of concerned government and non-government organisations, for the farmers about the existence and pathogenic effects of trichodinid ciliophorans. Another objective of our study will be to determine if there are any exotic species of trichodinid ciliophorans in the water bodies of our research area and their preference for any native host species and to understand whether there is any change at any level of the ecosystem.

IRAQ

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

Dokan Lake is a very large artificial lake which was formed in 1952 after the construction of Dokan Dam. The ecto- and endoparasites of Dokan Lake fishes were an attractive project for a young scientist, **Dr Shamall M.A. Abdullah**, who examined a total of 422 fish belonging to 14 species. His study revealed 51 species of parasites including: 3 species of protozoa, 11 monogenean species, 2 species of digeneans, 2 nematode species, 2 acanthocephala species, 5 species of Cestoda and 6 species of Crustacea. *D. tigræ*, *Ligula intestinalis* and *Neoechinorhynchus rutili* were most prevalent, while *Proteocephalus coregoni* was scarce. Dr Abdullah went on to do a PhD entitled “Ecology, Taxonomy and Biology of some parasites of fishes from Lesser Zab and Greater Zab rivers in north of Iraq” which was submitted and defended in 2002. He investigated the parasite species and determined the relationship between the parasitic infections and fish species, sex, and length (age), seasonal variations and geographic location. He also studied the life cycle of the digenenean, *Diplostomum spathaceum*, encysted in the eyes of fishes, and traced its entire life cycle between snails, fishes and birds. One outstanding result of the study was description a new species of acanthocephalan namely *Pomphorhynchus spindletruncatus* from the intestine of *Barbus xanthopterus* and *Aspius vorax*.

MÉXICO

provided by Scott Monks, smonks@uaeh.edu.mx

News from Mexico is a little brief this year; just as in the United States, we also had a couple of “dates” with hurricanes and they limited travel of the various groups. The research centers and universities of southwestern Mexico that specialise in ichthyoparasitology did not suffer extensive damage, although some of their campuses, especially those of Chiapas (El Colegio de la Frontera Sur) and Puerto Morelos

(Universidad Autónoma Nacional de México) were directly in the center of affected areas. The Sixth International Acanthocephalan Workshop was held in November 2005 in Chamela, México, and a brief summary is given under Meeting Reports. Although marred by the presence of hurricane weather in the United States, a bright spot for Mexican ichthyoparasitology was the presentation of the Henry Baldwin Ward Medal to **Gerardo Pérez-Ponce de León** (Laboratorio de Helmintología, Instituto de Biología, Universidad Nacional Autónoma de México [IBUNAM]). Research topics of his group focus on the biogeography and biodiversity of helminth parasites of freshwater fishes in Mexico, often in collaboration with international scientists such as **Anindo Choudhury** or **Daniel Brooks**. Other investigators from IBUNAM also continue their ichthyoparasitological contributions: **Rafael Lamothe-Argumedo** and **María del Carmen Gómez del Prado** (Dept. de Biología Marina, Univ. Auto. de Baja California Sur, B.C.S.) are working on hemiurid metacercariae (Trematoda) in chaetognaths; **Hugo Mejía-Madrid** finished his doctoral work and is now on a Postdoc with **Steven Nadler**; **Virginia León-Regàgnon** and collaborators are continuing work on *Gnathostoma*. **Guillermo Salgado-Maldonado**, in addition to his continuing work with the ecology and biodiversity of helminths of fish, was host/organiser of the Sixth International Acanthocephala Workshop (see Meeting Report).

Fernando García-Vargas (Centro de Investigación en Alimentación y Desarrollo, Mazatlán, Sinaloa), visited UNAM to work in the National Helminth Collection as part of his thesis on the helminthofauna of pargo (*Lutjanidae*) of the Pacific. **David González-Solís** (Parasitología del Necton, El Colegio de la Frontera Sur, Quintana Roo) is continuing work on the helminth parasites of *Lutjanus griseus* and *Gerres cinereus* from the southern coast of Quintana Roo. **Griselda Pulido-Flores** and **Scott Monks** (Universidad Autónoma del Estado de Hidalgo, Pachuca, Hidalgo) finished a couple of collaborative projects and started another on helminth parasites and their link to water quality. Several more students have entered their lab and 2, **Lorena Porraz-Álvarez** (helminths of carangids) and **Berenice Aleman-García** (a study of *Dollfusentis*) are finishing their theses and will be graduating in January.

We are pleased to have **Miguel Rubio-Godoy** back in Mexico. Miguel studied biomedical research at UNAM, Mexico, and received his PhD from the University of Bristol, UK working with **Richard Tinsley**. His doctoral work was a study of the host-parasite interaction between trout and the monogenean *Discocotyle sagittata*. He has now set up a fish immunoparasitology lab at the Instituto de Ecología, in Xalapa, Veracruz. He plans to first survey the parasite fauna of fish in the vicinity of Xalapa and to identify a practical host-parasite system (hopefully a monogenean!) on which to focus his immunoparasitological work. This area of research is poorly developed in Mexico, so Miguel is keen to collaborate with colleagues and prospective students. Please do get in touch at mrubio@ecologia.edu.mx if you have an interest in either collaboration or studying with him.

If I have not included your work or research group, be sure to contact me at smonks@uaeh.edu.mx with your information so it will be included in the next newsletter.

PERU

provided by José Iannacone, aphia2005@yahoo.com



On May 23, 2005, a new scientific Peruvian association named the **Peruvian Association of Helminthology and affiliated Invertebrates (APHIA)** was created. The aim of this association is to encourage and develop the study of helminths and affiliated invertebrates of consequence in conservation, biodiversity and Public Health. For that reason, APHIA will perform the following activities: a)

Continue and develop the study of helminths and invertebrates, b) Create a bibliographic archive related to helminths and affiliated invertebrates, c) Organise activities and scientific events, d) Promote the speciality of helminthology and affiliated invertebrates, e) Promote communication and coordination between specialists to develop research, f) Maintain communication with national and related foreign scientific communities, g) Publish a journal or other technical, scientific and educational documents, h) Advise non-specialists or politicians on topics of helminthology or affiliated invertebrates, i) Train and cooperate in national education on helminthology and affiliated invertebrates, and j) Establish agreements with national and foreign institutions to develop research projects of common interest. The Peruvian Helminthologist Day is on February 12, commemorating the signing of the foundation act.



The opening ceremony of APHIA and the oaths of the Directive Counsel 2005–2007 were performed on August 12, 2005 at the Faculty of Biological Sciences of Ricardo Palma University in Lima, Peru. In addition, certificates of membership were given to the 16 new associates of APHIA. Currently the Directive Counsel 2005–2007 comprises **Dr José Alberto Iannacone** (President), Biologist **Rufino Cabrera** (Vice-President), Biologist **Rosa**

Martínez (Secretary; pictured above taking APHIA oath), Biologist **Lidia Sánchez** (Treasurer) and **Dr Manuel Tantaleán** (Vocal). The editorial board of the *Neotropical Helminthology Journal* consists of the Biologist Rufino Cabrera (Editor-in-chief), José Iannacone (Associate Editor) and Manuel Tantaleán (Associate Editor).

To join the association you must be a professional or a student dedicated to helminthology or to an affiliated invertebrate group and conduct research and publish scientific articles in your specialty in Peruvian or foreign specialty journals.

Recently, Rufino Cabrera (pictured right taking APHIA oath) participated in the “VI National Biology Congress of Students (CONEBIOL)” of Peru (held October 17–21 in Lima) in the session entitled “Epidemiological Situation and perspectives of control of Hydatidosis in Peru”.



Three members of APHIA (from left to right): Manuel Tantaleán, José Iannacone and Marcelo Rojas.

TURKEY

provided by Naim Saglam, nsaglam@firat.edu.tr

There are a total of 12 Fisheries Faculties (established in Turkey in 1982) in different universities around Turkey. The main purposes of these Faculties are education and research in fields related to fisheries, aquaculture, the diagnosis and control of fish diseases in aquaculture and fishing and processing technology of fish. Thus, fish bacteriology, virology, parasitology, immunology, biochemistry, pathology, histology, genetics and toxicology are the main topics of the these Fisheries Faculties. Every 2 years, these faculties organise a national symposium on fisheries and aquaculture.

In September 2005, the XIII Aquaculture Symposium was held at the Fisheries Faculty at Çanakkale Onsekiz Mart University. At the symposium, oral presentations and posters were presented on the biology, ecology, pathogenicity, treatment and life cycles of monogeneans, *Ligula*, metazoan parasites, helminths and endohelminths of fish, ectoparasites of gold fish and some leech species. These presentations showed the increasing importance of parasites for fish health in aquacultured species and public aquaria. In addition, specific notes on diagnostic problems and solutions, pathogenicity and possible control methods were highlighted. All papers presented at the symposium will be published.

UNITED KINGDOM

provided by Ken Mackenzie, k.mackenzie@abdn.ac.uk

The study of the parasites of the anglerfishes *Lophius piscatorius* and *L. budegassa*, in collaboration with **Isabel Afonso-Dias** (University of Algarve, Portugal) continues. A paper describing 3 new species of myxosporeans from the gall bladders of these 2 host species is being prepared for publication.

Investigations of sealworm, *Pseudoterranova decipiens*, in cod and other fish in North Norway, with Norwegian colleagues **Willy Hemmingsen** (University of Tromsø) and **Erik Berg** (Institute of Marine Research, Tromsø) continues, as does the study of trypanosomes in cod and other fish species in the southern Barents Sea with Willy Hemmingsen and **Peder Jansen** (National Veterinary Institute, Oslo).

A new 3-year FRS PhD studentship commenced in October 2004, entitled "The biology and pathology of parasitic copepods of the genus *Lernaeocera*, potentially serious pathogens of farmed cod and haddock". The main objectives are to determine how many species of *Lernaeocera* infect marine fish in the northeast Atlantic and to identify their most suitable host species, using both traditional morphological and molecular biology methods backed up by experimental infections. This includes testing the hypothesis that those currently identified as *L. branchialis* constitute a complex of very similar (cryptic) species. The successful candidate is **Oliver Rault** and the project is a collaborative effort between the FRS Marine Laboratory (**Catherine Collins** and **David Bruno**) and The University of Aberdeen (**Ken MacKenzie** and **Les Noble**)

A new 2-year project "A survey of *Anisakis* and *Pseudoterranova* in Scottish Fisheries and the efficacy of current detection methods", funded by **The Food Standards Agency Scotland**, commenced in July 2005. The main objectives are to survey the levels of

infection with these nematodes in anglerfish *Lophius piscatorius*, cod *Gadus morhua* and whiting *Merlangius merlangus* on Scottish fishing grounds and to determine the efficacy of current techniques for detecting infections in fish fillets. The project is a collaboration between The University of Stirling (**Rod Wootten** and **James Bron**) and the FRS Marine Laboratory (David Bruno, **Campbell Pert** and **Rachel Kilburn**), with Ken MacKenzie as consultant. The majority of the research is being carried out by **Allan Petrie** as full-time post-doctoral research assistant.

VIETNAM

provided by Tran Thi Binh, tranthibinhs@yahoo.com

The Department of Parasitology, Institute of Ecology and Biological Resources, Vietnamese Academy of Science and Technology, Hanoi, Vietnam is headed by **Dr Nguyen Van Duc**. Parasitological research in the department covers a diversity of areas including helminths, arthropods and protozoa in man and other animals (vertebrates or invertebrates) in Vietnam.

The fish parasite group within The Department of Parasitology includes: **Tran Thi Binh**, **Nguyen Van Duc**, **Nguyen Van Ha**, **Nguyen Thi Minh**, **Luong Thi Quy**.

Our scientific focus is the study of helminth, arthropod and protozoan parasites in Vietnamese native and imported fish. In a recent study, 80 species of parasites were recorded from 20 species of fish. So far descriptions of 2 new helminth species have been published. We are also investigating the digenean, monogenean, cestode, nematode and acanthocephalan fauna from native fish from the north of Vietnam. The photo above is of a recent field trip to collect fish parasites.



Various fishborn zoonotic parasites are also being investigated in order to propose possible solutions for their prevention. We are currently studying the life-cycle of the Chinese liver fluke, *Clonorchis sinensis*, whose secondary host is fish.

IN MEMORIAM



Boris Lebedev

Professor Boris Lebedev, Head of the Department of Zoology at the Institute of Biology and Soil Sciences in Vladivostok, passed away in June 2005. Boris was a highly respected Russian fish parasitologist, whose name is well known to all monogenean workers. Despite the fact that his early work was on digeneans, by the 1970s Boris had transferred his allegiance to the Monogenea, although he still commented on

phylogenetic aspects and evolution of the former group and, indeed, of platyhelminths in general – with titles such as ‘Is the trematode acetabulum a cercomer?’ and ‘On the interrelations between phylogeny and systematics’. His main speciality, however, was the higher Monogenea, on which he was a world authority. His work on this group resulted, in the 1980s, in his book on the Suborder Gastrocotylinea and (published with Yuri Mamaev) a new classification for the higher Monogenea. During the 1990s and more recently he published and edited several books, including one on the biodiversity and evolution of oligonchoinean monogeneans and another on biodiversity and evolutionary parasitology. He also travelled abroad; he visited the UK and Mexico, and many will remember him from the early International Symposia on Monogenea – in fact he was due to give an invited talk to the ISM5 meeting in China in August. Boris Lebedev was a great specialist with great insights into evolutionary processes and phylogeny. He will be sorely missed by monogenean workers, especially in terms of the void he leaves in the field of marine polyopisthocotylean monogeneans.

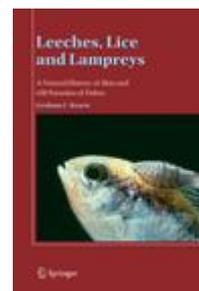
David Gibson

NEW BOOKS

Leeches, Lice and Lampreys A Natural History of Skin and Gill Parasites of Fishes

Author: Graham C. Kearn

2004, XVII, 432 pages 205 illus., Hardcover, ISBN: 1-4020-2925-X.
Springer Publishing. 90.00 €



Many different kinds of animals have adopted a parasitic life style on the skin and gills of marine and freshwater fishes, including protozoans, flatworms, leeches, a range of crustaceans and even some vertebrates (lampreys). There is a parasitic barnacle, described first in the 19th century by Charles Darwin, fish lice that change sex and bivalve molluscs parasitic only when young. This book explores for the first time in one volume, the remarkable biology of these little known and frequently bizarre animals.

The following closely interwoven themes are considered for each group of parasites: how they find their hosts, how they attach, feed and reproduce, the damage they inflict and how the host's immune system retaliates. Based on the British fauna, but extending where appropriate to examples from North America, Australia and elsewhere, the book is essential reading, not just for the professional parasitologist, but also for anyone interested in fishes and in this neglected field of British natural history.

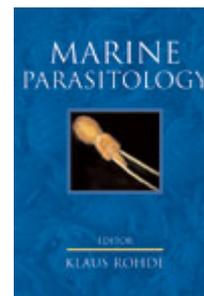
With the enquiring naturalist in mind, terms and concepts are explained as they arise, backed up by a glossary, and the text is liberally illustrated. An introductory chapter on fish biology sets the scene and common fish names are used throughout, as well as scientific names.

To order go to the Springer Online weblink at:

<http://www.springer.com/sgw/cda/frontpage/0,,5-40109-22-36292106-0,00.html> or contact Dr Graham Kearn at g.kearn@uea.ac.uk for an order form.

Marine Parasitology

Edited by: Klaus Rohde, University of New England
2005. 592 pages. Hardcover, ISBN: 0643090258. CSIRO Publishing
Australia. \$135.00 AUD



This comprehensive, authoritative and up-to-date work provides the definitive overview of marine parasites worldwide. It is an invaluable reference for students and researchers in parasitology and marine biology and will also be of interest to ecologists, aquaculturists and invertebrate biologists.

Initial chapters review the diversity and basic biology of the different groups of marine parasites, discussing their morphology, life cycles, infection mechanisms and effects on hosts. The ecology and importance of marine parasites are discussed in the second part of the book, where contributions investigate behavioural and ecological aspects of parasitism and discuss the evolution and zoogeography of marine parasites. In addition, the economic, environmental and medical significance of these organisms is outlined, particularly their importance in aquaculture and their effects on marine mammals and birds.

Written by an international team of contributors, the emphasis is on a thorough grounding in marine parasitology combined with reviews of novel concepts and cutting-edge research.

Features

- Combines detailed and well-illustrated coverage of all marine parasite groups with information on ecology and recent advances in marine parasite research;
- Gives an overview of the importance of parasites in the marine system, written in a way that can be understood by non-parasitologists;
- Features contributions by leading scientists from around the world.

To order go to the CSIRO Publishing Online weblink at:

<http://www.publish.csiro.au/nid/20/pid/5045.htm>

Fish Diseases and Disorders, Volume 1, 2nd edition: Protozoan and Metazoan Infections

Edited by: P.T.K. Woo, University of Guelph, Canada
Publication due February 2006. 800 pages Hardcover, ISBN: 0851990150. CABI
Publishing, UK. £135.00/\$250.00

Readership: Aquaculture and fisheries, parasitology and veterinary medicine.

Main Description

Written by experts actively working in the area, this book provides a review of the major diseases of fish caused by protozoan and metazoan parasites. The new edition has been thoroughly updated since publication of the first edition in 1995. It covers recent advances in the understanding of fish diseases including the improvement of diagnostic techniques and understanding of phylogenetic relationships stemming from the application of molecular techniques. The book also contains more detailed information on pathogens

that cause amoebiasis. To see more specific details of the contents or to order, go to the CABI weblink:

<http://www.cabi-publishing.org/Bookshop/BookDisplay.asp?SubjectArea=&PID=1901>

EDITORIAL POLICY

Please note that material for the next issue should be sent to the Editor, Dr Leslie Chisholm [e-mail: chisholm.leslie@saugov.sa.gov.au], Parasitology Section, The Science Centre, South Australian Museum, North Terrace, Adelaide 5000, South Australia, Australia: Fax: +61 8 8207 7222, **before** November 15, 2006.

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).

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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