

International Ichthyoparasitology Newsletter No. 11 January 2004

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CONTENTS

Editorial
Announcements
Meeting Reports
Updates
Current Research Activities in Various Countries (Australia, Brazil, Czech Republic, India, Iraq, Mexico, Spain, South Africa, United Kingdom)
In Memoriam (Oleg Bauer and Barry Munday)
Books
Editorial Policy

EDITORIAL

The highlight this year for many ichthyoparasitologists was undoubtedly the Sixth International Symposium on Fish Parasites in Bloemfontein, South Africa. For me personally it was a great opportunity to learn about current research in the field and to meet many colleagues with whom I had previously only “spoken” with via E-mail. I thank the organisers for running a fantastic meeting; a summary is included under Meeting Reports. I welcome Dr Laxmikant Damat as the new Regional Representative for India and thank Professor R. Madhavi for her assistance over the years. Sadly, 2003 saw the passing of 2 notable ichthyoparasitologists, Professor Oleg Bauer and Dr Barry Munday (see below).

Anyone wishing to contribute to the next issue of the Newsletter (Number 12) should note that the deadline date for submission is **October 31, 2004**. 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

AMERICAN SOCIETY OF PARASITOLOGISTS' EMINENT PARASITOLOGIST AWARD

provided by Timothy M. Goater, goatert@MALA.BC.CA

George Benz and I successfully nominated Dr Zbigniew (Bob) Kabata for the American Society of Parasitologists' Eminent Parasitologist Award, which 'honors someone of eminence and international visibility for their substantial contributions to parasitology.' The award was presented at the 78th annual meeting of the ASP on August 2, 2003 in Halifax, Nova Scotia, Canada.



Bob Kabata developed a life long passion and infectious enthusiasm for parasitic copepods. As a parasitologist he is perhaps most famous for his outstanding original research papers and books describing the morphology, life history, and development of these marvellously intricate animals. He is widely acknowledged as the foremost world expert in the field of parasitic copepod biology and systematics. Indeed, as a testament to the huge impact he has had on the field internationally, a total of 20 parasitic taxa (mostly copepods, but also including helminths and Myxozoa) from 15 countries carry his name! Respect for his meticulous systematic work (as well as his command of Greek and Latin!) earned him a 15 year stint as a Commissioner on the International Commission on Zoological Nomenclature. In the view of many, his pivotal book "Parasitic Copepoda of British Fishes" represents a landmark publication in Parasitology. He is currently completing another book, one that will represent a fascinating and phenomenal synthesis of the biology of parasitic copepods and the complex interactions with the environment and their hosts.

His groundbreaking research interests cover both basic and applied problems in fisheries Parasitology. He is without a doubt, one of the world's foremost fish parasitologists. Bob Kabata is famous in fisheries science as a pioneer in the use of parasites as biological tags, and for his ecosystem approach to managing fisheries. He was among the first to demonstrate that parasites could be valuable in identification and discrimination of commercially important marine fish stocks and in making vital fisheries management decisions.

He is the recipient of several Parasitology awards including the Wardle Medal from the Canadian Society of Zoologists and the Janicki Medal from the Polish Parasitological Society. Bob Kabata has served on the editorial boards of several journals, including the *Journal of Parasitology*, *Acta Parasitologica* and *Systematic Parasitology*. His international parasitological fame was further recognised recently when he was designated as honorary president of the Tenth International Congress of Parasitology held in Vancouver in 2002.

Bob Kabata is indeed a parasitological giant, someone we should all be proud to have among our ranks. The full transcript of the award introduction is published in the December 2003 issue of the *Journal of Parasitology*.

CAMALLANIDAE (NEMATODA) MOLECULAR PHYLOGENY SPECIMENS WANTED

We (František Moravec and Mark Rigby) have found that the existing generic divisions within the nematode family Camallanidae are unclear and perhaps inaccurate. Therefore, we are collecting specimens to perform a molecular phylogeny. At present, we have some specimens from Malaysia, Africa, China, Japan, the USA and Europe. However, we would like to make as robust a phylogeny as possible, incorporating as many species as possible. If you have, or can collect, specimens in ethanol (preferably 100% or 95% but 70% is also OK) that you would like to contribute to this effort, please contact either Dr Moravec (moravec@paru.cas.cz) or Dr Rigby (mark.rigby@tetrattech.com).

The Camallanidae is one of the more recognisable families of nematode parasites of fish. They have a red body and darkened hard mouthparts. They are found throughout the world (but are most diverse in tropical marine areas) in fishes, frogs and turtles. One species, *Camallanus cotti*, has even become cosmopolitan, as it is transported around the world by the aquarium fish trade.

MEETING REPORTS

Workshop under the research network SCOFDA (Sustainable Control of Fish Diseases in Aquaculture) Diagnosis and Control of Fish Diseases in Aquaculture

provided by Kurt Buchmann, kub@kvl.dk

A total of 60 participants from Denmark, Norway, Germany, the Netherlands, Spain, England, USA, Mexico, Scotland, Canada and the Czech Republic gathered for the 2 day workshop at the Royal Veterinary and Agricultural University (RVAU), Frederiksberg C Denmark, November 4 - 5, 2003. Researchers from universities and research organisations, aquaculturists and interested persons from governmental and private institutions were present. An overview of the presentations related to fish parasites is given below, but there were also excellent presentations on viral and bacterial diseases of fish that are not included here. Special guest lecturers were:

Dr Patrick Woo, University of Guelph, Canada

Dr Jan Rombout, Wageningen Agricultural University, The Netherlands

Dr Tony Ellis, Marine Laboratory, Aberdeen, Scotland

Dr Dion Florack, Plant Research International, Wageningen, The Netherlands

Dr Sarah Poynton, Leibniz Institute of Freshwater Ecology and Inland Fisheries, Berlin, Germany and John Hopkins University School of Medicine, Baltimore, USA

Miguel Rubio-Godoy, University of Bristol, England

Following introductory and welcoming words from the organiser and research network leader **Kurt Buchmann** (RVAU). **Jan Rombout** gave an overview of mucosal immunity in fish. This topic is of considerable interest to parasitologists, virologists and bacteriologists. Jan emphasised the difference between systemic and mucosal immunity in fish. Evidence was presented for antigen-uptake in epithelia, including gut, gills and skin. In this context the importance of T-cell like cells was considered, but also effects of various forms of immunoglobulin in the different compartments were stressed.

Patrick Woo gave a detailed update on the parasitic haemoflagellate *Cryptobia salmositica* in his talk on control strategies against salmonid diseases. This parasite occurs from California to Alaska in all *Oncorhynchus* species. Important aspects were discussed ranging from infection, clinical signs, pathogenicity, protective antigens, innate immunity, acquired immunity, chemotherapy and immunotherapy to breeding for resistant fish. He also gave a second presentation on recent studies on Cryptobiosis. He noted that more research is needed since >50% mortality rates in brood stocks are due to *Cryptobia*. Basic factors in humoral and cellular immunity were highlighted. Not only the presence or absence of the 200 KDa metalloprotease but also the parasite's physiology and use of mono- and disaccharides seem to be important in discrimination between virulent and avirulent strains.

Dion Florack reported on new molecular techniques for production of biopharmaceuticals and vaccines from plants such as potatoes, spinach and tobacco. This technique could be used in the future for production of vaccines in fish-farming. However, the group is working on optimisation of a system securing correct glycosylation of vaccine proteins.

Miguel Rubio-Godoy gave an interesting talk on immune responses in trout against *Discocotyle sagittata*. Basic epidemiological studies on infection in different hosts (brown trout and rainbow trout) were presented. Brown trout appear less susceptible than rainbow trout. Production of antibodies and the effect on worms together with *in vitro* studies on complement effects on *Discocotyle* clearly showed some involvement of humoral immunity.

Sarah Poynton gave a very informative lecture on diplomonad flagellates – distribution, disease and control. Basic biology, morphology and diagnosis of the genera *Hexamita*, *Spironucleus* and *Octomitus* were presented. Both intestinal and systemic infections with diplomonad flagellates were detailed. The importance of shape of nuclei, the recurrent flagella and arrangement of basal bodies and microtubules were discussed. In fact Sarah's TEM studies on the various flagellates infecting salmonids will be interesting to follow up.

Jens Sigh (RVAU) presented his new work on expression of immune relevant genes in rainbow trout during *Ichthyophthirius* infections and **Thomas Lindenstrøm** (RVAU) followed by describing cytokine expression in rainbow trout skin during *Gyrodactylus derjavini* infections. **Michael Dalgaard** (RVAU) studied different susceptibilities to *G. salaris* infections of Baltic and Atlantic salmon strains. The differences and the importance of immunity were discussed. Then **Steen Jørndrup** (RVAU) discussed different carbohydrate localisation on *G. derjavini* and *G. salaris* and corresponding carbohydrate binding capacities of their hosts *Salmo trutta* and *S. salar* that could be a factor in host specificity.

Generally, the discussions on the various topics presented were very animated. The participants also talked about the funding situation, forthcoming meetings and especially the upcoming European Association of Fish Pathologists meeting to be held in Copenhagen, in September, 2005. The organisation of this conference will be a major challenge. A fourth workshop on species of *Gyrodactylus* and their biology was also mentioned. It is likely that a joint Norwegian-Danish organisation of the autumn 2004 meeting is likely. All participants and the invited lecturers were thanked for attending this workshop. It not only had a fruitful scientific profile but the social contacts and events were also considered to be important for future cooperation.

Sixth International Symposium on Fish Parasites

provided by Sherman S. Hendrix, shendrix@gettysburg.edu



The Sixth International Symposium on Fish Parasites (ISFP) was held September 22-26, 2003 at the University of the Free State, Bloemfontein, South Africa. Eighty-nine delegates representing 22 countries attended this highly successful meeting hosted by **Jo and Liesl van As** and colleagues **Linda Basson, Candice Jansen van Rensburg, Ina Erasmus** plus their students in the

Department of Zoology and Entomology. The scientific program consisted of 69 oral talks and 36 poster presentations covering a wide range of topics of interest to ichthyoparasitologists.

The meeting was opened with a brief presentation by the Vice Chancellor of the University followed by the first session of the Scientific Program chaired by our host, Prof. Jo van As. **Robin Overstreet**, the first invited speaker, illustrated the problems of widespread mortalities of channel catfish in Mississippi aquaculture farms caused by diplostome metacercariae of the genus *Bolbophorus*. Additional invited speakers provided insight and perspective into other topics: **Annamarie Avenant-Oldewage** reviewed the use of fish parasites as biomonitors of pollution in South African rivers; **Angela Davies** considered gnathid isopods as vectors of the widely distributed protozoan *Haemogregarina bigemina*; **Iva Dyková** and **Jirí Lom** provided an overview of the amoeba and amoeboid organisms infecting fish; **Sherman Hendrix** presented new information on the biology of the monogenean *Bothitrema bothi*; **Lofti Khalil** summarised the status of knowledge of helminth parasites of sharks off of the coast of eastern South Africa; **František Moravec** gave an overview of the taxonomy and biology of dracunculoid nematodes parasitic in fishes; and **Ian Whittington** reviewed what is known of the classification, phylogeny and biology of capsalid monogeneans. The oral and poster presentations by delegates provided many interesting contributions to our knowledge of fish parasites and generated fascinating discussions both within and outside of the formal sessions.

Delegates were treated to several social events as a part of the symposium programme. The opening "Meet and Greet on Campus" was highlighted by a performance of a troop of Sotho dancers as well as outstanding food and drink. The Zoological Gardens was the site of a South African "braai" or barbecue held in a pavilion in the heart of the zoo, so that we were able to observe the many large animals on display as well as enjoy an excellent meal. A large group of delegates, graciously hosted by **Kevin Christison**, celebrated a reunion of those who attended the Brisbane Monogenea meeting by gathering at local restaurant on the free evening. There were quite a few "honorary monogeneologists" in attendance as well. The participants took great pleasure in sampling the local cuisine and beverages (including a beer tower commandeered by certain Scandinavians). A formal banquet held in the Student Centre on campus was enjoyed by all and comprised the closing event of the symposium. As was the case earlier, we were able to taste many of the outstanding foods and drink typical of the region.



This symposium would not have been possible without the enthusiasm, dedication and hard work provided by the whole 6th ISFP organising committee, who set up the meeting

on relatively short notice. During the last day, the international symposium committee and delegates heard 6 presentations for the venue in 4 years. After deliberation, the symposium committee announced Civitavecchia, Italy as the location for the 7th ISFP in 2007.

UPDATES

The International Fish Parasitology Committee

provided by David Gibson, dig@nhm.ac.uk

The Fish Parasitology (originally Ichthyoparasitological) Symposia were initiated in 1983 by **Jirí Lom**, **František Moravec** and colleagues at the Institute of Parasitology, Ěeské Budjovice, in the then Czechoslovakia. The meetings were intended as a major forum for fish parasitologists from east and west. This first and the subsequent meetings at Lake Balaton, Hungary, and Petrozavodsk, Karelia, USSR, were organised without a committee. However, at Petrozavodsk, the late **Professor Oleg Bauer** approached me and said 'David, we need a committee; you can be the chairman and you can have **Oleg Pugachev**, **Tellervo Valtonen**, ...etc. as members' — it was all very democratic! The purpose of this committee was to choose the location for the next meeting and for the chair to be available to open and close the meeting and thank the organisers. Although there were those who thought a committee unnecessary, it immediately proved its worth when new organisers had to be found for the fourth Symposium after the East German organiser had to withdraw. Without someone or a group to step in, these Symposia could have stopped at this point, as has happened with other series. At the fourth meeting in Munich, **Kazuo Ogawa** took over as Chair and the Committee replaced a number of its members. Having taken on a second stint as Chair at the fifth meeting in Ěeské Budjovice in 1999, Kazuo and his Committee had to take action in 2002 when the Scottish organisers in Aberdeen found that they could not arrange the 2003 meeting. The Committee selected **Jo van As** and his colleagues at Bloemfontein, who very ably arranged a splendid meeting (see above) at very short notice. At Bloemfontein, in addition to choosing Italy for the next meeting, some restructuring of the Committee was undertaken. It had been very Eurocentric, so more members from Asia/Australasia and the Americas were included to better reflect the distribution of recent attendees. At this meeting, Kazuo Ogawa stepped down as Chair and Jo van As was voted to replace him. The new committee consists of:

Jo van As – South Africa (Chair)

Kurt Buchmann – Denmark

Iva Dyková – Czech Republic

Simonetta Mattiucci – Italy (local organiser of next meeting)

Robin Overstreet – USA

Claudia Santos – Brazil

Ian Whittington – Australia

Tomoyoshi Yoshinaga – Japan

HOMSIR

A multidisciplinary approach using genetic markers and biological tags
in horse mackerel (*Trachurus trachurus*) stock structure analysis

This project, funded by the EU Commission within the 5th Framework Programme, Quality of Life and Management of Living Resources (Key Action 5: Sustainable agriculture,

fisheries and forestry), was described in Newsletter No. 9 and updated in Newsletter No. 10. The Final Report has now been submitted to the Commission and a series of papers arising from HOMSIR will be published in a Special Issue of *Fisheries Research* in 2004. The following brief summary will remind readers of the objectives and gives the main results.

The overall objective of HOMSIR was the biological stock identification of the Atlantic horse mackerel throughout its entire range in the Northeast Atlantic and throughout the Mediterranean Sea. To achieve this goal both established and innovative approaches were used, such as genetic markers, other biological tags (morphometry, parasites), tagging experiments and life history traits (growth, reproduction and distribution). Partners involved in the use of parasites as biological tags are: **Ken MacKenzie** and **Neil Campbell** (Department of Zoology, The University of Aberdeen, Aberdeen, Scotland); **Simonetta Mattiucci** (Institute of Parasitology, University of Rome "La Sapienza", Rome, Italy); and **Paula Ramos** and **Ana Pereira** (IPIMAR, Lisbon, Portugal).

Thirty-eight species and 7 higher taxa of parasites, including 11 new host records and 2 possibly new species of myxosporean, were recorded from *T. trachurus* during this study. When the infection data were analysed, they indicated that the North Sea population of *T. trachurus* should continue to be treated as a separate stock, but there was also evidence of some migration from areas to the west of the British Isles into the North Sea, possibly restricted to older fish. The distinction between the putative "western", "southern" and "Sahara-Mauritanian" stocks is less clear, with evidence of considerable mixing between populations. In the Mediterranean Sea, populations of *T. trachurus* appear to comprise 3 main stocks – western, central and eastern. There is also strong evidence of migration of fish from Atlantic populations into the extreme western part of the Mediterranean. The parasite results are in broad agreement with those from the other stock identification methods.

For more information about HOMSIR, visit our website at www.homsir.com

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.

Based on the HOMSIR model, WESTHER is also funded by the EU Commission within the same programme, but with a different target host and covering a smaller geographical area. The project is funded for a period of 3 years commencing 1 January 2003. This is an international project with partners in the UK, Ireland and Germany.

A considerable amount of research has been carried out on the complex of commercially important herring stocks in western European waters from the south-west of Ireland and the Celtic Sea to the north-west of Scotland. Despite all this effort, we still do not understand the inter-stock mixing and genetic interactions between components within this complex. The overall goal of WESTHER is to describe the population structure of herring stocks in this area. This will be achieved by a large-scale analysis of the genetic, morphological, physiological and parasite faunal differences across spatial clines of herring stocks in these western European waters. All the different methods of stock discrimination employed will be applied to the same individual herring. The Scientific Coordinator of WESTHER is **Emma Hatfield** (FRS Marine Laboratory, Aberdeen, UK). Partners involved in the use of parasites as biological tags are: **Ken MacKenzie** and **Neil Campbell** (Department of Zoology, The University of Aberdeen, Aberdeen, UK); **Jimmy**

Chubb and **Marcus Cross** (School of Biological Sciences, The University of Liverpool, Liverpool, UK); and **Carey Cunningham** and **Catherine Collins** (FRS Marine Laboratory, Aberdeen, UK).

To accommodate the requirements of partners in other disciplines using other methods of stock discrimination, we agreed to restrict parasitological examinations to the viscera of herring, which we receive preserved in alcohol. This ensures that the parasites collected are preserved in a state suitable for molecular genetics studies. An earlier biological tag study on herring from an area overlapping the WESTHER study area, provides a starting point for the current work by identifying parasites already shown to be useful tags. We expect to find further suitable tag parasites in herring from areas not covered in the earlier study. Two samples of juvenile herring from different nursery grounds off the west coast of Scotland have been examined to date. In these fish we found: the coccidian *Goussia clupearum*; 2 forms of renicolid metacercariae, *Cercaria doricha* and *C. pythionike*; the adult digenean *Hemiurus luehei*; and anisakid nematode larvae of *Anisakis* sp. and *Hysterothylacium aduncum*. There were significant differences between the parasite faunas of herring from the 2 nurseries, thereby providing a basis for optimism in tracing adult herring to their nursery grounds of origin. A number of samples from other parts of the study area have been collected and are awaiting examination.

For more information about WESTHER, visit our website at www.clupea.net/westher

CURRENT RESEARCH ACTIVITIES IN VARIOUS COUNTRIES

AUSTRALIA

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

The Marine Parasitology Group, headed by **Ian Whittington**, is bigger and busier than ever. This is our second year in Adelaide and early in 2003, 6 new students joined the newly renovated (and already too small!) lab at The University of Adelaide. These include PhD students, **Kate Hutson**, **Allan Mooney** and **Rissa Williams**, who are working on various aspects of parasites on kingfish *Seriola lalandi*. Kate is studying parasites of wild kingfish populations and how they may interact with farmed kingfish. Allan investigates many aspects of the biology of *Zeuxapta seriolae*. Rissa is testing several possible treatments for monogeneans infecting kingfish and, in September 2003, also started research on sea-caged barramundi. **David Schmarr** has started a PhD on stock assessment of slimy mackerel *Scomber australasicus* using parasites, otoliths and genetics. Two Honours students, **Ben Divett** and **Vanessa Glennon**, joined the lab and completed their projects in 2003. Ben investigated the efficacy of several natural remedies in fish-feed to remove skin and gill parasites from kingfish. Vanessa studied 3 monogenean species on/in the southern fiddler ray *Trygonorrhina fasciata*, including taxonomy, egg hatching and larval invasion strategies.

Work continues on the Yellowtail/Kingfish Parasite Management Project (headed by **Ingo Ernst**, The University of Adelaide) which was outlined in the last issue of the Newsletter. All fieldwork has been done in close cooperation with yellowtail and kingfish farmers in Japan and South Australia, respectively. Ingo and research associate **Clinton Chambers** (University of Adelaide) have had a busy 2003, coordinating student projects (Kate, Allan, Rissa and Ben; see above) and travelling to sites in distant Japan and to sites in the not so

distant Spencer Gulf, South Australia. This large project aims to develop integrated pest management strategies for monogenean infections of fish in sea-cage aquaculture. Research foci include: improved knowledge of species' life-cycles; comprehensive understanding of parasite infection dynamics; strategic application of treatments; modelling parasite populations and treatment strategies; and field tests.

When not distracted by various students (above), Ian Whittington (South Australian Museum/The University of Adelaide) continues work on Monogenea, including: clarification of the phylogeny of the Capsalidae; determining the finer points of the genus *Neobenedenia*; and studies on the anterior adhesives secreted by monopisthocotyleans, in collaboration with **Bronwen Cribb** (University of Queensland, Brisbane, Australia). In January 2004, **Graham Kearn** (School of Biological Sciences, University of East Anglia, Norwich, U.K.), will visit Adelaide for 4 weeks to complete some capsalid studies that commenced on Heron Island, Great Barrier Reef, over 10 years ago!

This year was the second year of the survey of metazoan parasites from elasmobranchs in Malaysian Borneo with **Janine Caira** and crew. Unfortunately, the Australian contingent was unable to travel to Borneo due to potential SARS-related issues. However, Janine (University of Connecticut) **Kirsten Jensen** (American Museum of Natural History, New York) and **Gavin Naylor** (Iowa State University) soldiered on and had an extremely successful trip. Many preserved gills and noses arrived by post and **Leslie Chisholm** has been busy dissecting them and finding many new species of monogeneans. Leslie and Ian must also complete their project on the ecology of monogeneans from the shovelnose ray from Heron Island even though they have started to collect parasites from fish in the South Australia region. Lack of research funds in 2004 means that Leslie will only continue monogenean work part-time.

A large contingent of the Marine Parasitology Group attended the 6th International Symposium on Fish Parasites in Bloemfontein thanks to travel awards from the Faculty of Science of The University of Adelaide (awarded to Ingo, Clinton and Leslie). Ian presented an invited talk on the Capsalidae.

BRAZIL

provided by Claudia Santos, cpsantos@ioc.fiocruz.br

The team at the Department of Biology (LAPSA) - Fundação Oswaldo Cruz - Av. Brazil 4365, Manguinhos 21045-900, Rio de Janeiro, Brazil has been busy working on a number of projects. Our team includes **Dr Claudia Santos** (senior researcher), **Dr Herman Lent** (senior research associate), **Mrs Susana Balmant** (MSc student) and **Ms Roberta Cura das Neves** (graduate student).

We are currently investigating the taxonomy of a number of marine fish parasites, the ultrastructure of cercariae from *Biomphalaria tenagophila*, the use of fish parasites as biological indicators of pollution and the taxonomy, ultrastructure and ecology of heterophyid metacercariae from *Poecilia vivipara* and *Jenynsia multidentata*.

CZECH REPUBLIC

provided by František Moravec, moravec@paru.cas.cz

Institute of Parasitology, Academy of Sciences of the Czech Republic, Branišovská 31, 370 05 České Budejovice, Czech Republic

Among the 2 main research lines pursued in the Department of Eukaryotic Microorganisms Infecting Fish, headed by **Iva Dyková** (iva@paru.cas.cz), priority is given to the identification of free-living (amphizoic) amoebae isolated from organs of freshwater and marine fish. This research is based on morphological and molecular approaches. In order to contribute to the knowledge on phylogeny of Myxosporea, SSU rRNA gene sequences of selected, morphologically diverse species are collected. To study the phylogenetic position of Myxozoa within Metazoa, LSU rRNA gene sequences are prepared and analysed. As a complementary topic, protozoa and related fish parasites – agents of emerging diseases are also studied.

Tomáš Scholz (tscholz@paru.cas.cz) and his group work on parasitic flatworms, especially cestodes, from the Holarctic Region, including Japan, but also from tropical and subtropical regions, such as Mexico and Nicaragua. A multidisciplinary study of fish cestodes using conventional and genetic methods (isoenzyme analysis, DNA studies) and based on close international cooperation, in particular with the group of **Vladimíra Hanzelová** (Parasitological Institute of the Slovak Academy of Sciences, Košice), made it possible to obtain new data on the morphology, ultrastructure, genetic variability and phylogenetic relationships of selected groups of fish cestodes of the orders Caryophyllidea, Pseudophyllidea, Proteocephalidea and Cyclophyllidea (family Gryporhynchidae) from Europe, Asia (Japan) and the Americas (Mexico, Nicaragua, USA). A large-scale study of cestodes of the genus *Eubothrium*, parasites of salmonid fish, provided new information on their host-specificity and distribution in Europe.

Another helminthological group headed by **František Moravec** is engaged mainly in studies of fish nematodes (occasionally other helminth parasites), including their morphology, taxonomy, ultrastructure, biology and DNA studies. After finishing a project on metazoan parasites of salmonids last year (the book devoted to these parasites in European salmonids will be published by Academia in Prague at the beginning of 2004), the team now works on 2 main research projects: (1) A complex study of dracunculoid nematodes; and (2) Research on fish nematodes in tropical and subtropical regions. A post-doctoral project of **Denisa Frantová** (vlkodlak@paru.cas.cz) is devoted to the ultrastructure and pathogenicity of some spiruroid nematodes from fishes. **Martina Wijnová**, an MSc student from the South Bohemian University, recently joined the team and is doing DNA studies of dracunculoids. The group has wide international links.

During the last 3 years, all the 3 research teams participated in a joint Czech-Chinese project (with the Institute of Hydrobiology, Chinese Academy of Sciences, Wuhan) oriented towards studies of fish parasites in Chinese fish culture.

INDIA

provided by Dr Laxmikant Basavaraj Dama, southraj@yahoo.com, www.draj.itgo.com

The Helminthology Group (Department of Zoology, Dr Babasaheb Ambedkar Marathwada University, Aurangabad, India) consists of Professor **Shinde G.B.**, Dr **Baba Jadhav**, Dr **Laxmikant Dama**, 4 doctoral students and numerous postgraduate students.

Our research programmes cover the taxonomy and ultrastructure of helminth parasites and the efficacy of anthelmintics on fish. One specific research project includes the investigation of parasitism by helminths in fishes from reservoirs and from their natural habitats. We have also established a databank of helminth parasites that includes more than 2,500 slides and taxonomic data. Our group has published 370 research papers in

the past 30 years on parasites of vertebrates and erected 10 genera and 60 species from fishes in Maharashtra State, India. All members of our group are life members of The Indian Society for Parasitology and **Baba Jadhav** has been elected as a member of the executive committee of this society for 2002-2004. He was also awarded the status of fellow in the Helminthological Society of India.

Research by **Shinde G.B** covers the systematics of cestode parasites of fishes and other related groups. He has erected 7 new species in 2 new genera from the following freshwater fish species: *Bagarius* spp., *Chela clupoides*, *Ophicephalus leucopunctatus*, *O. striatus*, *Mastacembellus armatus* and *Pseudeutropius taakree*.

Baba Jadhav is currently working on his DSc entitled 'Studies of cestode parasites of fishes'. His research work concerns the taxonomy, diversity, life cycles, experimental, field studies and population dynamics of helminth fauna in freshwater and marine fishes. He has studied 2 genera and erected 25 new cestode species from fishes. Specifically, he is examining the biodiversity of parasites and the role of parasites in the ecosystem and on the population structure of fish parasites. His research project vision is: 'Faunal diversity of helminth parasites of fishes from freshwater from Maharashtra State'.



The research programme of **Laxmikant Dama** includes: an improvement in our knowledge of life cycles, a comprehensive understanding of parasite infection dynamics and the strategic application of treatments and field tests. He is currently surveying helminth parasites in vertebrates from the western part of Maharashtra State. Recently, he surveyed the cestode genus *Senga* which parasitises freshwater fishes. Dr Dama has isolated drugs from natural products of Indian plants, including Juglone (5-hydroxy, 1-4 naphthoquinone) isolated from *Juglans regia*, Plumbagin from *Plumbago zylanica*, Lawsone from *Lawsonia alba* and Embelin from

Embelia ribes. He has also studied their chemotherapeutic effects against helminth parasites of fishes. In September 2003, he was elected as a member of the Executive Committee of Indian Pharmacological Society.

INDIA (North)

DR SANDEEP K. MALHOTRA DSc and his group, including **Neeshma**, **Geetanjali** and **Gopal**, work at the Parasitology Laboratory, Department of Zoology, University of Allahabad, Allahabad.

For almost 30 years, Dr Malhotra has worked on host-helminth systems in the Garhwal Himalayas, Ganga and Yamuna riverine ecosystems and the Arabian Sea at Dona Paula. This work is being done under a memorandum of understanding between the Parasitology Laboratory, University of Allahabad and the Aquaculture Division in the National Institute of Oceanography, Dona Paula, Goa.

Recently, the transport of consumable materials by inland shipping started between Allahabad and West Bengal. Therefore for the first time in India, there is a need for studies on "bioinvasion" to investigate the possibility of the transport of exotic parasitic species from marine to freshwater and hill-stream ecosystems via the Ganga-Yamuna riverine complex. Specific studies investigating the use of parasites as biological tags for fish stock discrimination at different geographical locations (hill-streams, the Ganga and Yamuna riverine ecosystems and the Arabian Sea) have been carried out. In addition, our long-term ongoing studies on the ecological cycles of protozoans (particularly myxosporideans), helminths (cestodes, nematodes, trematodes and acanthocephalans)

and ectoparasitic arthropods will help us make decisions on specific bio-indicators in parasitic communities. Insights into the patterns of parasite distribution will generate a basis for a hypothesis regarding the species-specific niche breadths of parasites in the Himalayan ecosystems, tropics and marine areas.

Dr Malhotra has also investigated the processes regulating the assemblages of various parasite taxa, including Protozoa (*Myxobolus* sp., *Ichthyophthirius multifiliis*) causing fatal diseases in cultured fishes, and of ectoparasitic arthropods. The zoonotic potential of black spot organisms, i.e. metacercariae of *Neascus vetestai* (Kaw) in *Schizothorax richardsonii* and *S. plagiostomus*, plus *N. channi* in *Channa punctata*, has been established and the results published in *Current Science*. The collection of similar data on disease prevalence cycles, particularly from hill-stream, freshwater (Gangetic plains) and marine (Arabian Sea) fishes, taking into account the potential parasites and pathogens of zoonotic significance, is important. The gaps in our knowledge of disease prevalence cycles under the influence of season and other hydrobiological interactions are a major handicap to the initiation of control and management strategies in fish health.

Work is also being done on microbial interactions between fungi, bacteria and viruses of the grass carp *Ctenopharyngodon idellus* and those in the body mucus of *Macrobrachium rosenbergii* that are cultured together in the same ponds at the Aquaculture Unit of the Satellite Scampi Farming Resource Centre, University of Allahabad. We want to determine whether organisms on the body of fish can be used as biocontrol organisms to kill viruses on the cuticle of scampi.

Dr Malhotra is also currently doing exciting work on laser-induced fluorescence and time domain investigations to establish the use of parasites and scales on fish as bio-indicators of environmental contamination. He found that resting cysts and sporocysts of *Myxobolus* sp. had markedly distinct peaks at 488nm and 514.5nm. The emission peaks corresponding to the behavioural variants of NADPH, calcium and amino acid mutants have been identified and a correlation to the comparative host-specific attributes established in *Catla catla*, *Hilsa ilisha* and *Labeo rohita*.

We have recently found undescribed parasitic turbellarians in freshwater fish. This finding could affect the concept that terrestrial parasites originated from marine turbellarians.

IRAQ

provided by Prof Dr Z.I.F. Rahemo (no email address)

Mohammad S.A. Al-Salihi submitted his PhD thesis (2002) entitled "Histopathological and histochemical studies on the cysts of larvae in some vertebrates in Neinava Governorate". Among the larvae found encysted in fishes were the metacercariae of *Clinostomum complanatum* collected from the freshwater fish *Barbus luteus* and nematode larvae in the genus *Contraecaecum* in the gastrointestinal wall of *Silurus glanis*. The thesis was supervised by **Prof Dr Zohair I.F. Rahemo** (Department of Biology, College of Science, University of Mosul, Mosul, Iraq).

Shamall M. A. Abdullah (2002) submitted his PhD thesis "Fishes from the lesser Zab and greater Zab rivers in north Iraq". Parasitic infections were investigated primarily in cyprinids from these rivers. Sixty-eight species of parasites were found, including 19 protozoan species, 30 species of monogeneans, 4 digenean species, 2 acanthocephalan species, 4 crustacean species. A new species of acanthocephalan was described from *Barbus xanthopterus* and *Aspius vorax* collected from the lesser and greater Zab rivers,

respectively. The entire lifecycle of the digenean *Diplostomum spathaceum* (through snails, fish and birds) was completed under laboratory conditions. The thesis was supervised by **Prof. Dr Farhan Thumed Mhaisen**.

Majid Bannai submitted his MSc thesis to the Department of Biology, College of Education, University of Basrah, Iraq. He examined the parasitic fauna of Khor Abdulla fishes in Basrah and found several species (some of them new) of trematodes and cestodes. The thesis was supervised by **Prof. Dr Abdul Hussian H. Awant** and **Dr Salem Al-Darag**.

Note from the Editor. The above submission from Iraq was intended for the 2003 Issue of the Newsletter however it was received by post too late to be included. It has therefore been printed in this issue; I apologise to Prof. Dr Rahemo for the delay.

MEXICO

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

This year parasitologists in Mexico did not have a national conference, so I was unable to speak with many of my colleagues. I apologise to those who have gone unmentioned.

María del Carmen Gómez del Prado (Dept. de Biología Marina, Univ. Auto. de Baja California Sur, B.C.S.) is continuing her teaching duties and work with parasites of fishes of the Gulf of California. Her student, **Oscar Méndez**, is continuing his MSc on helminths of elasmobranchs of the Gulf of California with an emphasis on helminths of sharks.

Investigators from the Laboratorio de Helmintología, Instituto de Biología, UNAM, **Rafael Lamothe-Argumedo**, **Gerardo Pérez-Ponce de León**, **Virginia León-Regàgnon**, **Luis García-Prieto**, **Guillermo Salgado-Maldonado** and **David Osario-Sarabia** were busy with various projects on helminths of fishes. **Hugo H. Mejía-Madrid** (supervised by Gerardo Pérez-Ponce de León) is doing a PhD at UNAM on the nematode parasites of Mexican freshwater fishes.

Raúl Pineda-López (Lab. de Parasitología, Univ. Auto. de Querétaro, Querétaro) has developed a new Master's programme at the Univ. of Querétaro that focuses on the integrated management of watershed resources. Several of his previous research projects have studied the biodiversity of aquatic communities, including the parasite communities of fishes, so it is certain that the study of fish parasites will be included in the new programme.

Edgar F. Mendoza-Franco (CINVESTAV-IPN, Merida, Yucatán), **Tomás Scholz** (Czech Republic; not currently in Mexico but well known to all) and **Guillermina Cabañas-Carranza** (UNAM) collaborated on the description of a new genus of dactylogyrid from the Mexican fish *Gobiomorus dormitor*. **Delane Kritsky** (ISU, Idaho) and Edgar Mendoza-Franco described another new monogenean in the genus *Pavanelliella* from *Rhamdia guatemalensis* in a Yucatán cenote.

At the Universidad Autónoma del Estado de Hidalgo, Pachuca, Hidalgo, Mexico, **Griselda Pulido-Flores** (Lab. Morfofisiología) is continuing her study of monogeneans of elasmobranchs. She, **Scott Monks** (Lab. Sistemática Animal) and **Steven Nadler** (Department of Nematology, Univ. Calif., Davis, Calif.) were awarded a cooperative UC Mexus-Conacyt grant to compare the genetic divergence among amphi-American *Echinocephalus* of Mexico and their stingray hosts. Scott and collaborators Hugo H.

Mejía-Madrid (Benemérita Universidad Autónoma de Puebla), **Maria del Carmen Corona-Vargas** (Universidad Autónoma de Tlaxcala) and **Jesus Fernandez-Fernandez** (currently a PhD student at UNAM) received a grant from SIZA-Conacyt to study the helminth parasites of freshwater fishes of the Reserve of the Biosphere “Barrancas de Metztlán”, Hidalgo. **Víctor Rafael Zárate-Ramírez**, **Shayuri Moreno-Flores** (MSc students) and **Ana Erika Gutiérrez-Cabrera** (BSc student) are participating in the project and will finish their degree studies at the end of 2003. Victor is studying the helminth diversity in fishes of the reserve, Shayuri is evaluating the possible risk of zoonotic infection for people in regional rural communities and Ana Erika is characterising the population of *Bothriocephalus acheilognathi* in fishes of a lake inside the reserve. **Kenia Magali Ortega-Sánchez** is continuing her thesis study of the morphology of the acanthocephalans currently assigned to *Floridosentis*. Several new students have entered the laboratories of Scott and Griselda: **Rosana Lopez-García** (cestodes of elasmobranchs), **Lorena Porraz-Álvarez** (helminths of carangids), and **Bernice Aleman-García** (meristic study of an acanthocephalan, a species of *Dollfusentis*). Presentations concerning themes such as the use of helminth parasites as bioindicators of water quality, biological invasions by helminth species and biodiversity of helminth parasites of fishes were made by various members of the laboratories at the national meetings of the “Foro sobre problemática del agua: un desafío para las IES”, “Congreso Internacional de Ciencias Ambientales”, and the “Foro de Investigadores, Día de la Mujer”.

For those of you looking for a place to continue your postgraduate studies, we have positions, with scholarships, for 2 graduate students to study the helminths of fishes. Of course, students would need to speak at least some Spanish (classes generally are taught in Spanish). For information on the graduate program at the Universidad Autónoma del Estado de Hidalgo, please check the following web pages at:

http://www.reduaeh.mx/oferta/icbi/maestrias/maest_recursosbioticos.pdf

http://www.reduaeh.mx/oferta/icbi/doctorados/doctorado_%20recursosbioticos.pdf

Those interested can also contact me for more information at smonks@uaeh.reduaeh.mx

SPAIN

provided by Toni Raga, toni.raga@uv.es



New aquaculture research facilities

A Pilot Plant of Experimental Aquaria has been inaugurated at the University of Valencia. This new facility occupies about 500 m² and is furnished with 114 tanks of different capacity (300 to 4,000 L), arranged in independent modules. The new plant, financed by the Ministry of Science and Technology and by European Regional Development Funds, is expected to cater for the needs in aquaculture research of both academia and private companies. Researchers of the University of

Valencia will work initially on reproduction, microbiology and parasitology of fish, particularly of eel, sea bass, sea bream and greater amberjack.

Our research group, the Marine Zoology Unit of the Cavanilles Institute of Biodiversity and Evolutionary Biology, is currently carrying out a project on monogenean infections on the greater amberjack. Evidence suggests that monogenean infections represent one of the most serious limitations to the eventual development of amberjack farming at a

commercial scale in the Mediterranean. These state-of-the-art facilities will enable us to design experiments aimed at fully elucidating the life cycles and developing preliminary methods for prophylaxis and control of these parasites.

The Marine Zoology Unit

The Marine Zoology Unit initiated its research activities some 20 years ago, focusing on parasites of marine mammals, but in the last years has diversified its interests within other areas of marine parasitology.

Dr Francisco Montero (francisco.e.montero@uv.es)

heads the investigations of monogeneans on amberjacks. **Dr Juan Antonio Balbuena**

(j.a.balbuena@uv.es) is responsible for parasite analyses within the EC-funded project “Establishing traceability for cod (*Gadus morhua*): determining location of spawning and harvest” (see www.codtrace.ie).

Dr Javier Aznar (francisco.aznar@uv.es) is currently leading investigations in community ecology, taxonomy and morphology of metazoan parasites of red mullets. **Dr Mercedes**

Fernández (mercedes.fernandez@uv.es) is a principal investigator for a project using community analysis of fish parasites to evaluate the environmental impact of the recent *Prestige* oil spill in NW Spain. **Dr Aneta Kostadinova** (aneta.kostadinova@uv.es) is a visiting postdoctoral fellow working with community ecology and taxonomy of Mediterranean marine fishes. **Dr Volodimir Sarabev** (volodimir.sarabev@uv.es) holds a NATO grant to study parasites of mullets as pollution indicators in Mediterranean aquatic habitats. **Dr J.A. Raga** (toni.raga@uv.es) is the team leader. He is currently in charge of a Marie Curie Host Development Project aimed at developing methodologies to establish the location of harvest of marine fish by analysis of their parasite assemblages.



SOUTH AFRICA

provided by Linda Basson, BassonL.SCI@mail.uovs.ac.za

Our group hosted the Sixth International Symposium on Fish Parasites in Bloemfontein, and we presented at total of 6 oral presentations. Most of our activities this year went into the planning and organisation of this symposium.

In the previous newsletter I reported on one of our major research projects: the study of fish parasites of the Okavango River and Delta in Botswana. After our last research visit at the beginning of this year, we submitted a successful tender to the Jakotsha Trust to build a permanent research camp within the swamp. We identified an island in the delta and we are now in the planning stages of building our camp.

Another project of our group, is the study of intertidal symbionts along the South African coast. We go on an annual trip to the De Hoop Nature Reserve, a pristine part of our coast. We normally stay at Koppie Alleen within the reserve and spitting distance from the sea. This quaint setup is built in the Cape Dutch style, and since there is no electricity, we normally take a generator for the microscopes. Otherwise there is gas for heating water and running the fridges and the stove, so overall it is far more luxurious than our normal field conditions. Several students have completed their MSc or PhD on various topics of symbionts in the intertidal zone. Presently, 2 PhD students are finalising their work on parasites of fish: **Cecile Reed** is working on the fish myxosporeans of southern Africa and **Nico Grobler** is busy investigating the caligid copepods of South African marine fishes.



Very little has been done on marine fish parasites in South Africa, leaving the field open for our group. The groups of fish parasites that we are concentrating on generally include: trichodinids, sessiline ciliophorans, myxosporeans, monogeneans, gnathiids and the blood parasites they transmit, tongue-replacing isopods, caligids as well as other copepods, such as the lernaeopodids. Our contributions to charting the biodiversity of parasites associated with marine fish include 2 new and 3 redescriptions of *Trichodina* species and 2

new as well as 2 redescriptions of gnathid species. So far 9 new myxosporeans representing 5 genera have been found and are in the process of being published. The previously unknown male of *Caligus mortis* was described (already published), while a further 6 caligids representing 4 genera, 2 lernaeopodids and 1 dichelesteiid copepod have been collected and are being processed for publication. The previously unknown male of an argulid was described from the east coast as well as a new species from a marine fish. A nematode, *Proleptus obtusus*, has also been recorded for the first time from the puffadder shy-shark, *Haploblepharus edwardsii*, collected along the South African coastline.

Our research along the South African coast, but specifically at the De Hoop Nature Reserve is continuing. Our aims are: to map the biodiversity of fish parasites along the South African coast; to determine pathology where applicable; to establish routes of transmission and elucidate life cycles; and to study reproductive processes, morphology and ultrastructure. We will then apply this information to elucidate phylogeny and evolution and to make our data available for management of our coastal resources.

UNITED KINGDOM

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

Ken McKenzie (The University of Aberdeen, Scotland) and his colleagues are involved in various projects that keep them very busy. One is a survey of the protozoan and metazoan parasites of the anglerfishes *Lophius* spp. in the northeast Atlantic. The 2 sympatric species, white anglerfish, *Lophius piscatorius* L., and black anglerfish, *L. budegassa* Spinola, are widely distributed in the northeast Atlantic. They are found together from around the British Isles to the Straits of Gibraltar and throughout the Mediterranean and Black seas, with *L. piscatorius* being more abundant than *L. budegassa* in northern areas. The scarcity of information on the parasite faunas of these commercially important species prompted the start of the present survey in 2001 by **Isabel Afonso-Dias** (The University of Algarve, Faro, Portugal) with Ken MacKenzie acting as a consultant. The main aim is to identify parasites that may be used as biological tags to help in population studies of the 2 host species. The project is funded by the Portuguese Fundação para a Ciência e Tecnologia for a period of 3 years until February 2004.

Checklists of the parasites reported from both *Lophius* species are being prepared for publication. One of the problems encountered during the compilation of these checklists concerned the identification of the hosts, because we suspect that *L. budegassa* has been frequently misidentified as *L. piscatorius*, especially in the older literature. Sixty-three different taxa, including 44 named species, have been reported from *L. piscatorius*, 4 of these species being new host records from the present study. Twenty-two taxa, including 16 named species, have been reported from *L. budegassa*, all but 4 of which are new host

records from the present study. Three new species of myxosporeans found in the gall bladders will be described in a separate publication. So far the most promising tag parasites identified are the myxosporeans and 2 species of the digenean genus *Stephanostomum*.



We are also investigating the sealworm, *Pseudoterranova decipiens*, in cod (*Gadus morhua*) and other fish in North Norway. This project commenced in 2003 and is funded by the Institute of Marine Research, Tromsø, Norway. Research partners are: **Willy Hemmingsen** (left) (University of Tromsø, Norway), **Erik Berg** (Institute of Marine Research, Tromsø, Norway) and Ken MacKenzie. Infections of the nematodes *Pseudoterranova decipiens* and *Anisakis simplex*, commonly known as “codworm” and “herringworm” respectively, present a major aesthetic and human health problem for the fishing industry. Increased levels of infection of cod in coastal areas of North Norway in recent years

are considered to have been the result of 2 factors: (1) a change in the diet of cod, from feeding mainly on the pelagic species capelin and herring, which are not infected with codworm, to feeding on small demersal species of fish that are known to be heavily infected, and (2) an increase in the numbers of seals in the region. The aim of this project is to determine the levels of infection in cod and small demersal species of fish caught at a number of selected stations along the coast of Troms and Finnmark counties. For comparative purposes some of the stations are close to, and others distant from, major seal colonies. The same stations will be sampled annually to obtain long-term data and to record changes in levels of infection in relation to other environmental factors.

The Institute of Marine Research is also funding Willy, **Peder Jansen** (Department of Fisheries, Oslo, Norway) and Ken to investigate the effect of the presence of the introduced red king crab (*Paralithodes camtschaticus*) on trypanosome infections in cod and other commercially important marine fish in north Norway. Since the introduction of *P. camtschaticus* to the Barents Sea from its native north Pacific in the 1960s by Russian scientists, a rapidly growing and disseminating population has become established in coastal areas of the southern Barents Sea. The marine leech *Johanssonia arctica* has been shown to be the vector for *Trypanosoma murmanensis*, a blood parasite of marine fish first reported from cod in the Barents Sea. This leech has a circumpolar distribution and lays its eggs on various species of crab, including *P. camtschaticus*. This study was undertaken in response to concerns that the burgeoning population of king crabs in the Barents Sea will lead to an increase in the population of the leech *J. arctica* and consequently, to an increase in the level of trypanosome infection in cod. *Trypanosoma murmanensis* has been shown to be capable of killing juvenile cod, and heavy infections are likely to have debilitating sublethal effects on adult cod and other fish.

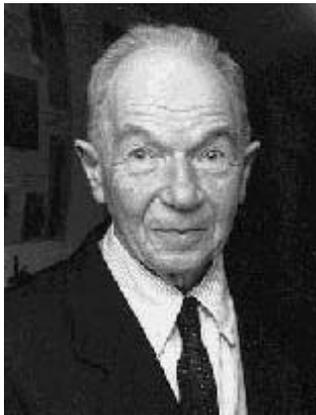
Every year since 1999, during an annual research vessel cruise, Ken (right) and colleagues have taken blood samples at the same trawl stations along the north coast of Norway, mainly from cod but also from some other common demersal species. For comparative purposes, the survey includes areas where red king crabs are common and areas to which they have not yet spread. Cod and haddock (*Melanogrammus aeglefinus*) carry the heaviest trypanosome infections and show significant geographical variations in both prevalence and intensity of infection. The



heaviest infections each year have been recorded from eastern Finnmark, where the population of king crabs is greatest, and decreases westwards towards areas to which they have not yet spread. There is, however, one other small focus of relatively heavy infection in western Finnmark that coincides with an area where indigenous spider crabs (*Lithodes maja*) are known to be particularly abundant. We suspect that there are at least 2 species of trypanosome and 2 species of leech with different distributions in our study area. The results to date are currently being prepared for publication.

IN MEMORIAM

Oleg Nikolayevich Bauer 1915-2003

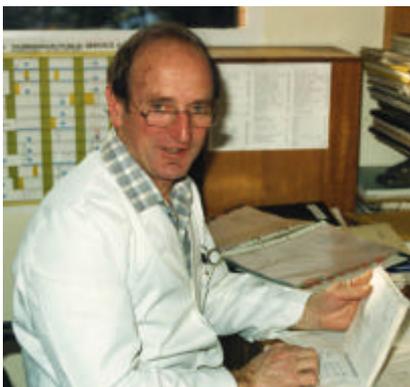


It is deep regret that we announce the passing of Professor Oleg Bauer of the Zoological Institute in St Petersburg. Professor Bauer was a huge influence in the world of fish parasitology over the past 50 years. He was enormously productive, helped formulate the principles of ecological parasitology and, with his excellent English, did much to communicate the results of Russian parasitologists to the west.

A Profile of Oleg Bauer, which will appear in *Systematic Parasitology*, is being prepared by Professor Clive Kennedy.

Barry Laing Munday 1933-2003

provided by Rob Gurney robert.gurney@csiro.au &
Ian Whittington whittington.ian@saugov.sa.gov.au



Barry Munday, one of Australia's most outstanding authorities in fish pathology and native fish diseases, passed away on Saturday, May 10, aged 70. He was Chief Veterinary Officer at the Mount Pleasant Laboratories in Launceston from 1978 to 1985 before entering academia at the then Tasmanian College of Education. Barry left Mt Pleasant in order to continue his research career rather than take up a senior administrative post in primary industry. He did not wish to be confined to a desk, indeed Barry made it all too clear that he intended to continue to be an active researcher for the rest of his life.

Barry was a key member of staff in the embryonic aquaculture program being developed at the Tasmanian State Institute of Technology from 1985–1987. In 1988, the TSIT was awarded a Key Centre in Teaching and Research in Aquaculture and Barry was made a Senior Research Fellow and Lecturer, following which Barry attracted a plethora of Honours, Masters and Doctoral students from all over Australia and many other countries. In 1992, the University of Melbourne awarded Barry the degree of Doctor of Science – a

rare honour for a veterinary scientist. His peers at the time variously described Barry as a truly outstanding animal health scientist, gaining, both nationally and internationally, the respect of the scientific world in general via publications and applied veterinary diagnostic practice. Barry published more than 100 refereed scientific papers in international journals including, among other things, a wide range of topics in fish parasitology. The University of Tasmania appointed Barry a Reader in 1993 and until his death he continued to supervise higher degree students, carry out research programs and give lectures. His graduates and colleagues will continue his work in several areas.

His death will leave a huge void, not only in Tasmania but also in Australia as a whole. Indeed his expertise was continuously in demand and he gave generously of his time and knowledge to all who sought assistance.

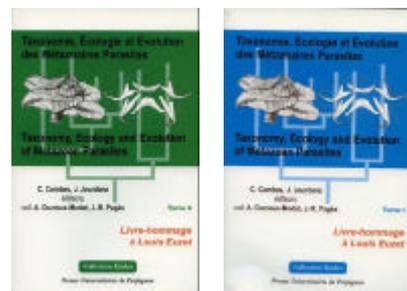
BOOKS

A thematic issue of *Advances in Parasitology* was published in October 2003. Entitled "The evolution of parasitism, a phylogenetic approach" the volume is comprised of a diversity of chapters written by parasitologists who use phylogenetics in their research. Titles likely to be of interest to ichthyoparasitologists include the following: Nematoda: genes, genomes and the evolution of parasitism - Mark Blaxter; Life cycle evolution in the Digenea: a new perspective from phylogeny - Tom Cribb and colleagues; Phylogenies, the comparative method and parasite evolutionary ecology - Serge Morand and Robert Poulin; Recent results in cophylogeny mapping - Mike Charleston
Publisher: Academic Press; ISBN: 0120317540, 386pp., edited by D.T.J. Littlewood.

Taxonomy, ecology and evolution of metazoan parasites. Livre-hommage à Louis Euzet

Editors: Claude Combes & Joseph Jourdan

This work (in 2 Volumes) includes 36 contributions written by a team of 75 international specialists on metazoan parasites. Many contributions deal with fish parasites and will be of interest to ichthyoparasitologists. The subjects treated range from taxonomy, biodiversity, phylogeny and evolution to a wide variety of topics on the biology of these parasites, including, development, life-history, ecology, host-specificity, adaptation, immunity, reproduction and genetics.



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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 the end of October, 2004.

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, preferably saved as Jpeg files, are welcome. Hard copies of images can also be sent directly to the editor for scanning.

In order to save postal charges, 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. It is hoped that the use of electronic formats rather than hard-copy will enable us to distribute information on ichthyoparasitology throughout the world quickly and cheaply.

Thank you

Leslie Chisholm

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