

International Ichthyoparasitology Newsletter No. 5 May 1996

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*** * * * EDITORIAL * * * ***

Another year, which included an exciting Fourth International Symposium on Ichthyoparasitology, has passed by. Many fish parasitologists (250 people from 26 countries) met together, discussed parasites and tested the beer at Munich, Germany, during October 1995. The highlights of the Munich meeting are outlined in this issue.

This particular issue (No. 5) is reaching you late, because I was Seattle during the early spring conducting a joint study with U.S. scientists.

I should like to thank the following persons for their contributions to this issue: R. Hedrick, R. Hoffmann, D. I. Gibson, I. Paperna, A. Gaevskaja, A. K. Das, R. Madhavi and K. Buchmann.

Electric mail via the Internet is now available to many recipients of the Newsletter. The Editor (K. Nagasawa) and Associate Editors (D. I. Gibson or J. R. Arthur) are able to send you the Newsletter through Internet directly and quickly. This enable us reduce the time and cost involved in distribution. If you wish to receive the newsletter in this form, please contact one of us. We shall also try to make the newsletter available on David Gibson's Web pages (at: <http://dspace.dial.pipex.com/town/plaza/aan18/index.htm>).

Due to pressure of work, I feel that I must stand down as the Editor of this Newsletter. I am proud to have been the founding editor and have enjoyed putting together the first five issues. Dr. Glenn Bristow (Norway) has kindly agreed to take over the editorship for the next issue.

For anyone wishing to contribute to "International Ichthyoparasitology Newsletter", the deadline for submission of information for the next No. 6 issue is 15 December 1996 (please see the "Editorial Policy").

Thank you

Kazuya Nagasawa

****** FOURTH INTERNATIONAL SYMPOSIUM ON ICHTHYOPARASITOLOGY ******

October 3-7, 1995, Munich, Germany

The Fourth International Symposium on Ichthyoparasitology was held during October 3-7, 1995 at the Institute of Zoology, Fish Biology and Fish Diseases, University of Munich, Germany. The symposium, organised by Professor Dr. Rudolf Hoffmann and Dr. Mansour El-Matbouli, hosted 250 scientists from 26 countries for an excellent scientific and social program. The scientific program consisted of 7 plenary lectures, 109 contributed papers and 52 posters on a wide-range of topics concerning on fish parasites, from the ecosystem to molecular level.

All of the presentations and posters were of an excellent standard, with new and stimulating data which add to our knowledge of fish parasites and their impact on the fish host. The conference began with a historical perspective on early investigations on fish parasites at the University of Munich and then moved to detailed descriptions on the distribution of the helminth parasites among fish populations and their influence on fish community structures. A review of new developments with protozoan parasites preceded in depth descriptions of newly recognized life cycles for the Myxozoa, including previously unknown alternate stages (actinosporeans) and the means by which they invade the fish host. The utility of molecular and cellular approaches were evident in reports confirming the identity of corresponding myxosporean and actinosporean stages and studies into the potential origins of the Myxozoa. Advantages of these molecular tools as applied to fish parasitology were also demonstrated in studies probing the function and phylogenetic relationships of microsporidians, trypanosomes and helminth parasites.

While employing molecular tools were stressed, it was clear that a continued need exists for accurate, detailed and concise morphological descriptions of fish parasites as they relate to structure, function and taxonomy. Many high quality reports described these features of fish parasites which form the basis for further work at the cellular and molecular levels.

The role of therapeutics to control fish parasites was reviewed and then followed by individual reports on treatments that have shown promise for both histozoic and external parasites of fish. Future studies on vaccination as a method of controlling parasites and the underlying immunological mechanisms that must be understood for their efficacy were only briefly discussed.

Woven into this comprehensive scientific program were visits to the German Museum of Hunting and Fisheries, the beautiful lake at Koenigsee, the fisheries field station at Wielenbach and the monastery and brewery at Andechs. The scientific sessions and informal dialog and social programs provided all the participants of the Fourth International Symposium on Ichthyoparasitology with fresh perspectives. The participants left Munich with new and renewed cooperations and friendships that will forge future advances in fish parasitology. These aforementioned qualities of the symposium attest to its success. In closing, success is earned. In this case it came

from the hard work of the organisers, their staff and the many participants who came and presented their research findings.

Ron Hedrick (School of Veterinary Medicine, University of California-Davis)

NB!

A limited number of copies of the Abstract Volume is still available at a price of 25 DM plus postage.

Rudolf W. Hoffmann (University of Munich)

*** * * * ANNOUNCEMENTS * * * ***

1. The Fifth International Symposium on Ichthyoparasitology

During the Symposium at Munich, the Symposium Committee met and was pleased to accept the invitation from the Czech Republic to hold the next meeting. The Fifth Symposium will, therefore, take place at Ceske Budejovice in 1999 and will be organised by Dr. F. Moravec and his colleagues. The Committee was delighted to receive offers from six other countries who were willing to provide reserve venues.

Having completed its task, the Committee [Drs. R. Arthur (Canada), D.I. Gibson (UK, Chairman), E. Ieshko (Russia), K. Molnar (Hungary), K. Ogawa (Japan), O. Pugachev (Russia), E.T. Valtonen (Finland)] was replaced by a new Committee [Drs. K. Buchmann (Denmark), Prof. A.V. Gaevskaja (Ukraine), Prof. R. Hoffmann (Germany), C.M. Morrison (Canada), K. Ogawa (Japan, Chairman), T. Scholz (Czech Republic)].

David Gibson (The Natural History Museum, London)

2. Seventh European Multicolloquium of Parasitology

EMOP VII will take place at Parma, Italy (2-6 Sept., 1996) and will have a significant ichthyoparasitological content:

The Symposium "Parasites of fish" organised by Lia Paggi and David Gibson will have two sessions: one with five invited talks; one with 12 submitted talks; plus a poster session with c. 50 posters. The invited talks are:

Christina Sommerville - Current approaches to sea lice research.

Tor Bakke - Recent development in *Gyrodactylus* research.

Frank Moravec - New developments in the research on *Anguillicola* spp., pathogenic nematode parasites of eels.

Simonetta Mattiucci - Genetic and ecological research on marine anisakid nematodes.

Clive Kennedy - Predictability of helminth communities of freshwater fish.

There will also be a Symposium on "Fish parasites as indicators of environmental quality" organised by Ilan Paperna and Glenn Bristow.

Programme:

Opening lecture Overstreet, R. (US): Parasitological data as monitors of environmental health.

Invited speakers

Subject 1: Does, and how xenobiotic substances affect parasite communities?: Are fish affected by pollution prior to the parasites or parasites before fish?

Gelnar, M. et al. (Czech Republic): Biodiversity of parasites in freshwater in relation to pollution.

Khan, R.A. (Canada): A multidisciplinary approach using biomarkers, including parasites as indicators of pollution.

Taraschewski, H. & Sures, B. (Germany): Heavy metal concentrations in parasites compared to their fish hosts: bioconcentration by acanthocephalans and cestodes.

Hoole, D. (UK): The effect of pollution on the immune response of fish: implications for parasite fauna.

Subject 2: Fish parasites as early warning system for environmental deterioration.

McVicar, A.H. (UK): The development of marine environmental monitors using fish diseases.

Marcogliese, D.J. & Cone, D.K. (Canada): Parasite communities as indicators of ecosystem stress.

Valtonen, E.T., Holmes, J.C. & Koskivaara, M. (Finland): Eutrophication, pollution and fragmentation: effects on the parasite communities in roach (*Rutilus rutilus*) and perch (*Perca fluviatilis*) in four lakes in central Finland.

Yeoman, W.E., Chubb, J.C. & Sweeting, R.A. (UK): Use of protozoan communities for pollution detection.

Subject 3: What ecological models and quantitative parameters may be applied in use of parasites as bio-indicators of environmental quality?

Lotz, J. (US): Quantitative aspects of evaluating the consequence of pollution for parasite populations and communities: models and data analysis.

d'Amelio, S. (Italy): Evaluation of environmental deterioration by analysis fish parasite biodiversity and community structure.

Halvorsen, O., Harvigsen, R.D. & Norborg, P.C. (Norway): Search for spatial patterns and their underlying causes in fish parasite assemblage.

Discussion: Can parasite species ever serve as indicator species? Opening comments by C. R. Kennedy.

David Gibson (The Natural History Museum, London), Glenn Bristow (University of Bergen)

* * * CURRENT RESEARCH ACTIVITIES IN VARIOUS COUNTRIES * * *

I. ISRAEL [provided by I. Paperna]

Long-term ichthyoparasitological research conducted in the Israeli laboratories centers on some of the more persistent parasitic infections of economic importance in the farmed fish, namely, coccidiosis in cichlids and ornamental cyprinids (by I. Paperna and M. Vilenkin, Faculty of Agriculture of the Hebrew University of Jerusalem, in collaboration with W. Koerting and D. Steinhagen of the School of Veterinary Medicine, Hannover, Germany); the biology of *Contracaecum* of piscivorous fish infecting farmed tilapia (by I. Paperna *et al.*, with L. Paggi *et al.* of La Sapienza, University of Rome); Myxospora in grey mullets (by I. Paperna *et al.*) and epizootiology and pathology of myxosporan infections in farmed sea bream (by A. Diamant, National Center for Mariculture, Eilat, Israel Oceanographic & Limnologic Research).

Indispensable information is provided through the routine disease diagnosis of farmed food fish as well as ornamental fish carried out in the following laboratories: Laboratory for the Research of Fish Diseases, Nir David (by I. Bejerano *et al.*); National Center for Mariculture, Eilat (by A. Diamant and A. Colorni); Migal Laboratory, serving fish farm of north Israel (by A. Hammerschlag); and Maagan Michael Laboratory in the coastal region (by R. Ariav). Finding from the routine service work provides the necessary information for setting up relevant goals and priorities for the direction of applicable research on fish parasites as well as on other causes of diseases in the aquaculture system. These organisations are also engaged in the testing and development of parasiticides and other relevant preventive measures to counter epizootic infections in the farms. Diagnosis and surveillance of diseases of freshwater farmed fish has been carried out in Israel since 1950, and of sea-farmed fish since 1973. Nonetheless, we are still repeatedly challenged by new aetiological agents including both protistan and metazoan parasites, which require our attention and efforts to devise means to alleviate their harmful effects. The continuous flux of pathogens into our mariculture system is inevitable as we deal with a relatively new enterprise, fish are kept in open systems (constant circulation or sea cages) and we are still in the process of introducing wild species into artificial rearing. The main sources for new infections in freshwater systems are the ornamental fish imports, particularly cyprinids (ornamental carp and goldfish). Our inland water farming systems are also in a continuous transition through intensification and introduction of new holding methods. Improvement in water quality seems to facilitate entry into culture system of parasites previously found only in native fish in natural habitats. These, once established, proliferate to morbid infections in farmed stocks. Improvement in water quality also facilitates proliferation of invertebrate vectors of parasitic helminths in these systems (copepods and the molluscs *Bulinus truncatus*, *Lymnaea* spp., and *Melania tuberculata*). The spread of metacercariae (*Centrocestus*, clinostomatids and diplostomatids) and larval nematode (*Contracaecum*) infections via piscivorous birds (pelicans and herons) is enhanced as these birds frequent fish ponds once their habitats are increasingly eliminated. I. Paperna as well as A. Diamant and their students in collaboration with the professional staff of the diagnostic services are currently engaged in identification and description of these new, and newly encountered aetiological agents (to mention some; intestinal and tissular *Cryptobia* spp., *Hexamita* of tilapia, aetiological agents of goldfish and tilapia visceral granuloma, *Cryptosporidium* in intestines of marine fishes, *Coccidia* in grey mullets, *Sanguinicola* in cichlids, *Bothriocephalus acheilognathi* in ornamental carp), their biology, and their effect on

the fish.

Another aspect of fish parasitological research carried out in Israel is in the context of environmental protection and effects of marine pollution: two long-term studies are in progress on the potential use of parasite population parameters and indices as bio-indicators of environmental deterioration of coastal marine habitats by anthropogenic interference. The first framework of EC-AVICENNE initiative carried out in I. Paperna laboratory in collaboration with L. Paggi and P. Orreccia, Rome, Italy; A. Elefteriou, Crete, Greece; and L. Abou-Basha, Alexandria, Egypt. The second program supported by the German Ministry of Science aims to correlate parasitological parameters with chemical (pollutant residues) metabolic and pathological findings and involves both I. Paperna & A. Diamant laboratories in collaboration with German scientists (W. Koerting, Hannover, and von Westerhagen, Hamburg).

II. UKRAINE [provided by A. Gaevskaja]

Department of Ecological Foundations of the Control of Hydrobiont Parasitoses, Shmalgauzen Institute of Zoology, National Academy of Sciences of Ukraine, B. Khmel'nitsky st. 15, Kiev 30, 252601, Ukraine. Fax: 380 (44) 224 15 69, Tel: 380 (44) 10 70. Email: nnb@iz.freenet.kiev.ua

Basic aims of the Department's activities:

- i) A study of species composition, biology and ecology of fish parasites under normal, artificial and farming conditions; ii) Elaboration of methods for treatment and predicting diseases of fishes and other hydrobionts.

The staff includes 5 research scientists:

Otto N. Davydov, Head of Department. Research topics: ecology of parasites; host, parasites and environment interaction, means of protection of hydrobionts against diseases.

Igor A. Balachnin, senior research scientist. Research topic: fish immunity - immune status during infection, genetic aspects of resistance to diseases.

Larisa Y. Kurovskaya, senior research scientist. Research topic: physiology of fish-parasite interaction.

Natalya M. Isaeva, senior research scientist. Research topic: fish mycoses and mycotoxicoses and their treatment and prevention.

Sergey S. Gunkovsky, junior research scientist. Has collected data for his PhD "Parasites of farmed salmonids in Ukraine".

III. INDIA [provided by A. K. Das and R. Madhavi]

1. Zoological Survey of India (ZSI), 'M' Block, New Alipore, Calcutta 700 053, India: A. K. Das and N. C. Nandi.

ZSI is a national survey organisation which was established in 1916. It concentrates mainly on exploration and survey of faunal resources of India, from Protozoa to

Mammalia (including their parasitofauna), and undertakes research on taxonomy, ecology, and wildlife.

While working on the "State Fauna" of India, 5 scientists belonging to the Lower Invertebrate Division of the ZSI (headed by Dr. A. K. Das) have studied a large number of protozoan and helminth parasites of fishes in various states, mainly from the taxonomic viewpoint, as follows:

i. State Fauna of West Bengal, India

Under this project, 143 species of Protozoa have been dealt with from 65 species of fish hosts (Fauna of West Bengal, Part 12, State Fauna Series, 3: 135-468, 1993). Furthermore, 14 species of Cestoda and 22 species of Nematoda are also recorded from 15 and 17 species of fishes, respectively.

ii. State Fauna of Meghalaya, India

In all 2 protozoans, 14 cestodes, 9 trematodes and 5 nematodes have been recovered from 2, 7, 8 and 4 species of fish hosts, respectively.

iii. State Fauna of Tripura, India

In this project 4 species of protozoans, cestodes and nematodes have been recorded from 4 species of fishes and 5 trematodes from 20 species of fishes.

iv. Protozoa Fauna of Sundarban Mangrove Ecosystem, India

A total of 14 species of parasitic protozoans have been reported from 12 species of fishes inhabiting Sundarban mangroves (Rec. Zool. Surv. India, 93: 83-101, 1993).

v. Epizootic Ulcerative Syndrome in Fishes

Epizootiology of the ulcerative disease in the fishes of West Bengal was studied and the occurrence of a flagellate, *Ichthyobodo necator* (= *Costia necatrix*) associated with the disease was reported for the first time (Indian J. Fish., 37: 61-62).

2. University of Madras, Department of Zoology, Madras 600 025, India: P. Ramaswamy.

Dr. P. Ramaswamy and his team of students are working on the biology, ecology, ultrastructure and physiology of helminth parasites, in particular monogeneans, of fishes. They are concentrating their studies on the biology of *Euclinostomum* spp. from *Channa striatus*, the ultrastructure of marine monogeneans, the parasites of cultured tilapia, and microbial diseases of prawns.

3. Theagraya College, Department of Zoology, Pathobiology Unit, Madras 600 021, India: S. Jayadeva Babu.

Mrs. Ponmozhi Gokulanathan and Dr. S. Jayadeva Babu have been studying, for the past three years, the macroparasites of freshwater table fishes from the Kirshnagiri Reservoir of Tamil Nadu State.

4. Ravishankar University, Department of Biosciences, Raipur 492 010, India: A. K. Gupta.

Investigations on various aspects of ichthyoparasitology have been carried out, including pathophysiology, pathology, histochemistry, histoenzymology and detailed taxonomic studies. The themes include Monogenea of fishes (families Siluridae,

Clariidae, Bagariidae, Heteropneustidae, and Mastacembalidae), Acanthocephala (*Pallisentis nagpurensis* from *Channa punctatus*), bacteria of freshwater fishes (siluroids), and the pathophysiology of *Channa punctatus* (under EUS attack). The osmotic behaviour of *Lytocestus indicus* (Cestoda) and its excretory products have also been studied.

5. University of Kerala, Department of Aquatic Biology and Fisheries, Trivandrum 695 007, India: S. Radhakrishnan.

Dr. Radhakrishnan and his group are actively studying parasitic infections of freshwater fishes in terms of ecology and population dynamics. Flatfishes are also studied. He has completed a detailed survey of ergasilids on fishes in Kerala waters, and a study of microhabitat ecology of these parasitic copepods is in progress. His other fields of research include acanthocephalan infections on snakeheads, metazoan parasites of mullets, the myxozoan fauna of local fishes, and nematodes of freshwater fishes.

6. University of Allahabad, Department of Zoology, Parasitology Laboratory, Allahabad 211 002, India: Sandeep K. Malhotra

Dr. Malhotra is actively studying the ecosegregation in parasitocoenosis in high altitude ecosystems. He has reviewed both ecological ichthyoparasitology in India and the correlation between the systematics and environment of the black spot disease in Indian fishes. His major contribution here is a study on the effects of pollution on the population dynamics of a bucephalid in *Entropiichthyes* sp.

7. Andhra University, Department of Zoology, Division of Proto-zoology, Visakhapatnam 530 003, India: C. Kalvati

Prof. Kalavati is currently engaged in the study of myxosporean parasites of deep-water fishes from the Bay of Bengal, assessing the feasibility of their use as biological tags. Together with Dr. Padma Dorothy of the same institution, she is also involved in laboratory experimental studies with tubificids, ostracods and bryozoans as possible intermediate hosts in myxosporean life cycles.

8. Andhra University, Department of Zoology, Division of Applied Parasitology, Visakhapatnam 530 003, India: R. Madhavi

Prof. Madhavi's school of parasitologists are still active in helminth studies of both marine and freshwater fishes. Recently, her student completed a comprehensive thesis on clinostome trematodes. This study includes taxonomy, biology and micro-ecological surveys of the infections. Prof. Madhavi and Dr. Meenakshi Murugesh have published their long-awaited information on didymozoid digeneans. A number of papers have appeared on helminth parasites of scombrid fishes from the Visakhapatnam coast. Prof. Madhavi is continuing her studies on the parasite fauna of mullets and is now incorporating additional information on the effects of pollution on helminth infections in mullets.

IV. DENMARK [provided by K. Buchmann]

A group of researchers in Denmark are currently engaged in a programme with the title, "Disease prevention, genetics and nutrition in the production of rainbow trout", supported by the Danish Research Councils. Viral, bacteriological and parasitological infections in selected trout farms in Denmark are monitored and a number of parameters (management, feed, temperature, oxygen) are recorded as well. By the use of microsatellites the genetics of the trout strains are elucidated. A number of new rainbow trout parasite species (geographical records) for Denmark have been listed. In addition, work has been conducted to elucidate the ecology of eye flukes in Danish trout farms. Studies on in vitro cultivation of *Hexamita salmonis* are in progress. Experiments elucidating the susceptibility of Danish strains of rainbow trout to infections with *Gyrodactylus salaris* and *G. derjavini* have been planned.

*** * * * NEW BOOK * * * ***

Gibson, D. I. (1996): *Trematoda*. In: Margolis, L. & Kabata, Z. (Eds), *Guide to the parasites of fishes of Canada*. Part IV. Can. Spec. Publ. Fish. Aquat. Sci., no 124, 373 pp. [ISBN 0- 660-16403-5; NRC Research Press, National Research Council of Canada, Ottawa, Ontario K1A 0R6, Canada; \$50 (Can)].

More than 80 keys leading to the identification of more than 220 species of trematode parasites of Canadian fishes are provided. Diagnoses of more than 80 family-group taxa and 130 genera are given. A representative of each genus is illustrated. For each species of trematode a Canadian host list, locality data and any relevant remarks are included. In addition, a host- parasite list is given plus parasite and host indices.

*** * * * OBITUARY * * * ***

Adilja Kovaljova (1937-1995)

Adilja A. Kovaljova died on September 28, 1995; she was 58 years old. The cause of her death was cancer. Adilja graduated from Lvov University (Ukraine) and began her work with marine parasites, mainly helminths, as a junior scientist at Karadag Branch of the Institute of Biology of the Southern Seas (Crimea). She completed her dissertation on helminths of carangid fishes in 1970. She also worked at the Atlantic Research Institute of Fisheries and Oceanography (AtlantNIRO), Kaliningrad, from 1970 to 1995. She was first a senior scientist but in 1987 she was appointed as a head of parasitological division of this institute. During her 33 years of work, Adilja published more than 100 articles, alone or with others, on marine parasites. For the last 20 years, the main objects of her research were myxosporeans. Her studies of marine myxosporeans contributed to our present knowledge of the taxonomy, ecology and geographical distribution of these protozoans. She described many new

species and genera and some new families of myxosporeans. Moreover, some species of parasites (e.g. *Gonapodasmius kobaljovae*, *Stephanostomum kovaljovae*, etc) are named for her.

dilja was a bright woman and enjoyed marine parasitology. She was my best friend.

Albina Gaevskaja (Institute of Biology of the Southern Seas)

*** * * * EDITORIAL POLICY * * * ***

Please note that material for the next issue should be sent to Dr. Glenn Bristow, Zoologisk Institutt, Universitetet i Bergen, Allegaten 41, N-5007 Bergen, Norway (e-mail: glenn.bristow@zoo.inst.uib.no).

At present, the Newsletter is planned to be issued once a year. The persons listed on the cover page act as regional representatives. Each representative will write or collect information from the members of each country or region. Naturally, direct contributions from any recipient to the Newsletter will be acknowledged. Any news, notices, comments, etc. that you feel would be of interest to the world's ichthyoparasitologists are welcomed. For the present, in order to save postal charges, one copy of each issue of the Newsletter will be sent to each representative, who will produce copies for his or her domestic members. When it is impossible to make copies, please advise me. In addition, the Newsletter is available by E-mail. Those who have an E-mail address are advised to contact the Editor (K. Nagasawa) or Assistant Editors (D. I. Gibson or J. R. Arthur) and enable us to distribute information on ichthyoparasitology throughout the world quickly and cheaply.

Thank you

Kazuya Nagasawa