MONOCULUS *Copepod Newsletter*

The Newsletter of the World Association of Copepodologists

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MONOCULUS Editor: Janet W. Reid
Research Associate, Division of Science & Learning
Virginia Museum of Natural History
Martinsville, Virginia 24112, U.S.A.
Tel. +1 276 656 6719; Fax. +1 276 656 6701
E-mail jwrassociates@sitestar.net

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WAC Homepage
http://www.copepoda.uconn.edu
MONOCULUS Homepage
http://www.copepoda.uconn.edu/newsletter
MONOCULUS Homepage – University of Oldenburg
http://www.uni-oldenburg.de/monoculus

Message from the President

Dear copepodologists,

Every three years since 1981, planktologists, systematists, parasitologists, limnologists, and aquaculturists come together for a conference and turn into copepodologists, with the effect that over the years more and more of them return home and remain copepodologists. This has to do with a shift in biology, which according to E. O. Wilson leads from the still-prevailing emphasis on levels of organisation which has dominated biology since the late 1950s, to a renewed stress on taxonomic groups of organisms. This shift does not mean the return of biology to purely descriptive natural history, but rather to the study of particular groups of organisms across all levels of organisation. In a short note back in *MONOCULUS* 25 ("Plaire et instruire") I cited E. O. Wilson and pointed out that our conferences are a good example of this new trend. They bring together experts from various disciplines and turn them into something new: into copepodologists. This means a group of organisms at the centre looked at from the different angles of the various disciplines.

Due to this shift in biology and the integrative role of our conferences, a new science has emerged: copepodology, which among the aquatic disciplines could rise to an importance equalling that of, e.g., entomology or ornithology on the terrestrial side. Entomology and ornithology have a long tradition and can look back on a long history of scientific discovery. But copepodology can too, as David Damkaer demonstrates with the first volume of his history of copepod research since Aristotle (see the book review by Janet Bradford-Grieve further below). The roots of our science also reach far back, and the way from the hazy beginnings to the present day is paved with the names of many outstanding and world-famous scientists. There are heroes for every aspect of copepodology. The book, I am sure, will have the effect that readers will identify themselves even more with this science, of which the great achievements have been looked at in the past as successes of other disciplines. In Damkaer's book they are put into a new context, and one result of this is the emancipation of copepodology.

Damkaer portrays those who did the work and highlights their main contributions to our science. Compiling the complete record of their written legacy, though, has been the work of someone else: of Willem Vervoort. His "Bibliography of Copepoda" has been another milestone in the emancipation of copepodology. There is such a wealth of scientific information on copepods, but before Vervoort's compilation no one was able to gain a comprehensive

knowledge, because this information was so widely scattered in the literature. But the most important step in the emancipation of copepodology was the establishment of our conferences and our newsletter *MONOCULUS* through the initiative of Dov Por, the conferences practising and the newsletter defining copepodology. For the first time planktologists, systematists, parasitologists, limnologists, and aquaculturists came together with a new unifying goal: the comprehensive study of copepods for their own sake.

I am glad that I could play an active role in this enterprise from the very beginning. First as Editor of the first 25 issues of *MONOCULUS* from October 1980 until March 1993, then as General Secretary under the Founding President of WAC, Zbigniew Kabata, and finally as one of the organizers of the 6th International Conference on Copepoda in Oldenburg. Now I am President of the World Association of Copepodologists for the next three years, and my first task is to lead you into a new era, the electronic age. Here is the first on-line issue of our newsletter and its new editor, Jan Reid, will explain all about it.

— Kurt Schminke, President of the World Association of Copepodologists
Oldenburg University, Germany

Editor's Notes

Since 1980, the *MONOCULUS Copepod Newsletter* has been the essential communications thread connecting many of the world's copepod researchers. Kurt Schminke and Gerd Schriever assumed the serious and time-consuming task of editing, producing, and disseminating *MONOCULUS* through those early years; it was distributed free of charge with the aid of financial support from the Universities of Oldenburg and Kiel. After the founding of the WAC in 1987, continuing support from these institutions, and the volunteer services of Hans Dahms in Europe, E.J. Maly, Frank Ferrari, and Chad Walter in North America, M. Madhupratap in India, Shin-ichi Uye in Japan, Rubens Lopes in Brazil, and especially Chang-Tai Shih in North America and then in Taiwan, who re-mailed copies to colleagues in their respective regions, enabled the cost of distribution to remain low and was crucial to sustaining the WAC's always modest financial structure. In 1993 Hans Dahms assumed primary responsibility for editing *MONOCULUS*. The long-term efforts of Kurt, Gerd, and Hans to provide this venue for communication are deeply appreciated by all of us.

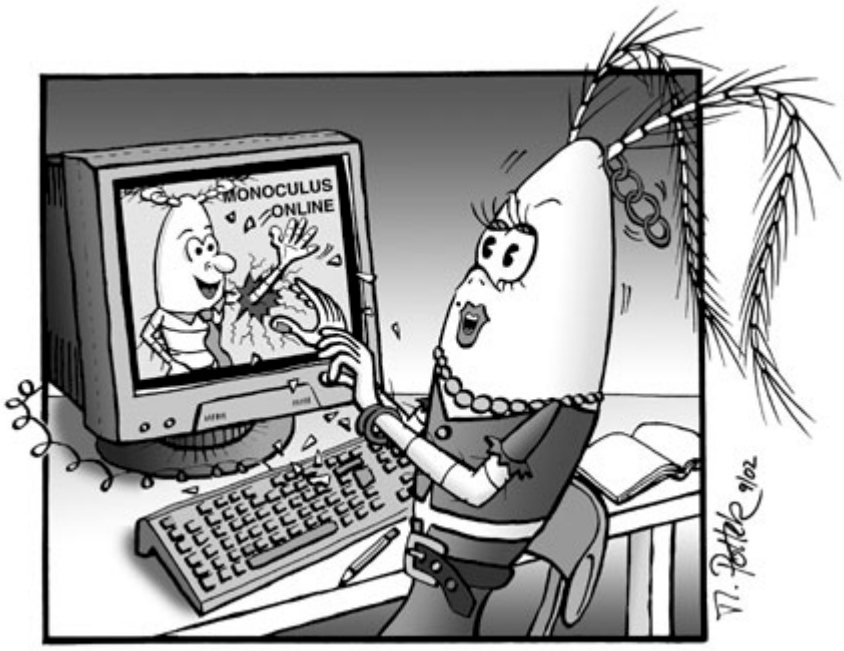
After the WAC Website went on-line in May of this year, the then Executive Committee took the decision, ratified by the present EC, to distribute the newsletter mainly electronically in the future. This method has the obvious advantages of prompt delivery to most members, at the lowest possible cost. Even with the re-mailing services of the several colleagues mentioned previously, postage has historically been the greatest drain on WAC finances. Moreover, the former system often resulted in delays of months in receiving the newsletter. Each new number of *MONOCULUS* will now appear on the WAC Website as a PDF file. However, a few printed copies will continue to be made. These will be sent to the Monoculus-Library in Oldenburg and the C. B. Wilson Copepod Library in Washington; to any other library which is presently archiving *MONOCULUS*; and to any WAC member in good standing who is unable to access and print out a PDF file. *Please notify the Editor if you wish to receive a printed copy for these reasons.* The twice-yearly (spring and fall) publication schedule will be maintained.

In the "electronic age," is there a real role for *MONOCULUS*? Obviously yes, besides just the archival aspect. The newsletter will continue features such as news about the copepod conferences; essays from members; official WAC documents such as the bylaws; the lists of new publications on copepods, which are provided by Chad Walter; notifications of address changes; and artwork by our favorite cartoonist Mark Pottek and others. In this number there are essays by two of the students who were among the recipients of awards for best student presentations at the 8th ICOC in Taiwan. I hope that others of our younger colleagues will be able to contribute similarly to future numbers; we need to hear from them.

The WAC Website will feature some of the same information as *MONOCULUS*, but will also provide prompt notice of, for example, upcoming Conferences and other meetings of interest to members; positions available; forums and discussions; long-term features such as those on collecting methods and lists of literature on specialized topics; and of course immediate electronic "delivery" of *MONOCULUS*. Rubens and I will be pleased to receive your opinions and suggestions for improvements and new features.

For their contributions and assistance for this number, I thank Geoff Boxshall, Janet Bradford-Grieve, C. Herbert Fernando, John Fornshell, Shih-Hui Hsiao, Jiang-Shiou Hwang, Rubens Lopes, Elena Markhaseva, Kizzie Osore, Mark Pottek, Kurt Schminke, Sami Souissi, Chad Walter, Elke Willen, and Cheng-Han Wu.

— Jan Reid
Martinsville, U.S.A.



Our newly launched communication initiatives will only serve their purpose if the community takes an active part in their existence and continuous improvement. Therefore, we invite you to make the WAC website your homepage, and to send your contributions (texts, research notes, job offers, photos, links, cartoons, etc.) on any subject related to copepod research and education. Jan Reid (jwrassociates@sitestar.net) and I (rmlopes@usp.br) will be delighted to assist you in publishing your material either in *MONOCULUS* or directly in other sections of the WAC website.

— Rubens M. Lopes
University of São Paulo, Brazil

WAC Website

The WAC website was released last May at the address http://www.copepoda.uconn.edu. Its primary goal is to offer an efficient communication tool to every person interested in copepodology, members and non-members of WAC. The website features several sections dealing with WAC matters, such as structure and legislation, history, information on previous and forthcoming meetings, and instructions on how to join the association. In the near future, we plan to add a searchable address database that will enhance our ability to keep our membership records updated, and will help people to locate and to contact each other. A job section is open, waiting for postings. Another very important section deals with what we hope will turn into our primary communication channel on a daily basis, the Copepoda List. The website then moves towards the vast world of copepods and copepod science. We have posted just a few examples of interesting and useful resources that may be published on the WAC website, such as basic information on collecting methods, annotated bibliographies on specific topics, project descriptions and news, links to research and educational projects dealing with copepods, and much more. Last, but not least, previous issues of *MONOCULUS*, dating back to 1981, have been converted to PDF format and posted online. As you just learned above from Jan Reid, *MONOCULUS* has entered a new electronic age on the Internet, and the WAC website will serve as a safe and easy-to-access home for our newsletter.

Letter of Appreciation

Prof Jiang-Shiou Hwang,
Department of Marine Biology,
National Taiwan Ocean University,
Keelung, Taiwan, Republic of China
30th July 2002
Dear Professor Hwang,

I am just writing to congratulate you on the marvellous job that you, as chairman, and the other members of the Local Organizing Committee did for the recent Eighth International Conference on Copepoda. The conference was an enormous success and, as retiring President of the World Association of Copepodologists, I would like to express the gratitude of the entire world community of copepod researchers for your professional and meticulous preparations. The conference facilities at NTOU were first class and the support staff worked tirelessly to provide support for speakers, poster presenters and other participants.

The science programme was well planned and the choice of symposia covered a wide range of issues, which are highly relevant to society, such as the role of copepods in aquaculture and in pollution monitoring. The level of financial support for invited speakers, council members and delegates from developing countries was by far the best ever achieved in the entire history of the Association. The generosity and vision of your sponsors has enabled young researchers from many developing countries to meet and interact with top researchers from all continents. The positive benefits of this will continue for many years. In addition you managed to stimulate considerable interest

from the media, which resulted in TV and press coverage, enabling us to communicate our message on the importance of research on copepods to the public.

I would also like to thank you for the support and sponsorship of the pre-conference workshop on copepod systematics and biology, held at the National Museum of Marine Biology & Aquarium (NMMBA) in Kenting. As you know, a group of seven highly experienced tutors devoted a week to an intense training course for 33 student participants from Taiwan, Korea, Japan, Philippines, Iran, Tunisia, Australia, USA, South Africa, UK, Hong Kong and Kenya. The laboratory and lecture room facilities provided at the NMMBA were perfect for the purpose, and it was a privilege to be part of the intense group dynamic that developed during the week. Again the local organisers excelled in their attention to every detail in planning a memorable week and we are extremely grateful to our host, the NMMBA, for their support and help.

As I talked to many scientists from around the world, it was apparent that everyone was taking home special memories of a unique conference. In particular we were all impressed by the high standard of Taiwanese scientific research, by the smooth and professional organization of the conference and workshop, and by the friendly and courteous nature of the Taiwanese people. The conference was a massive success and Taiwan has made many friends.

Yours sincerely,

Prof. Geoff A. Boxshall

Past-President, World Association of Copepodologists

The Museum of Natural History, London, U.K.

A Flying Copepod

There is a report in the literature on flying copepods. They are said to take off with a jump from the water's surface and to return to it after a long curving glide through the air. I always found this difficult to believe. Approaching the venue of the "8th International Conference on Copepoda" in Keelung, from the distance one saw floating in the air high above the roofs a yellow balloon. Coming nearer it turned out that there were two objects side by side, a balloon with the logo of the conference and a copepod, a kind of cyclopoid female with two egg sacs. This was the first flying copepod I saw and, I am sure, it was the first not only to me.

When at Curitiba we had to decide where to go next for our 8th conference we had the choice between Greece and Taiwan. Hwang Jiang-Shiou presented Taiwan and in particular the National Taiwan Ocean University as the possible venue. He promised a land of milk and honey in respect to funds and cultural highlights. I was doubtful, but he gained the majority of the votes at the business meeting. Later, on a postconference tour to the Pantanal, a great wildlife reserve in Brazil, we sat together in the bus and he talked about his plans. His optimism and enthusiasm were so contagious that I was convinced that a good choice had been made. The conference itself made it amply clear that Jiang had not exaggerated a bit in Curitiba and Geoff Boxshall was right in praising in his welcome message as President of WAC in the conference booklet "their unparalleled success in fund-raising, their highly efficient planning and their desire to provide us with an interesting cultural experience."

When the time of the conference approached Jiang and I exchanged many email messages. He told me that he had succeeded in obtaining support from various government funding agencies so that apart from the registration fee there would be no additional costs for the participants. This fee would cover transport from the international airport to the hotels and back, daily transport from hotels to the conference venue, daily lunches and coffee breaks, the welcome reception, conference and farewell banquets, mid-conference tour and proceedings. He would also be able not only to give financial support to invited speakers, officers of WAC, and preconference workshop instructors, but also to make a contribution to the programme of student travel awards initiated by the WAC Executive Committee. Finally, he had the plan to support up to 20 very good copepodologists from developing countries. The result was that finally there were 255 registrants from 50 countries.

I did not have time to look into my conference bag until after the welcome reception in the Evergreen Hotel. We were prepared for a few snacks but there was a lavish buffet dinner with excellent Chinese food. The atmosphere was relaxed and cheerful as always when people meet again who had not seen one another for quite a long time. At tables along the walls little gifts were prepared for us to take home (fans with watercolours, sheets with calligraphic texts, silhouettes for which one had to pose, figures on sticks etc.) More gifts turned up when emptying the conference bag after the reception: a mug with the conference logo, a kit with knife, fork, spoon and chopsticks, and even the bag itself is such a gift with an embroidered, not a printed logo, evidently a bag that is going to last for very long. The farewell banquet on Friday was similar to the welcome reception on Sunday, only the food was even better and there were groups of dancing children for entertainment. Yet, the most exquisite food awaited us at the banquet after the mid-conference excursion. It was at the impressive Grand Hotel in Taipei, one of the ten best hotels in the world, that we could choose from 80 or more different dishes, one more delicious than the other. We had spent the day first at the coast at Yehliu where sea and wind had eroded the sandstone rock creating artistic forms like a mushroom, a woman's head or the back of an elephant. We had passed through Yangmingshan National Park seeing waterfalls and volcanic craters. We had admired the treasures of the National Palace Museum in Taipei comprising Chinese cultural relics, the earliest dating back as far as the Neolithic period, and we

watched the changing of the guard at the Martyrs Shine with a parade performed in synchrony and in artistic choreography. What a fantastic day! It ended with a short tour through Taipei by night.

The opening of the conference began with a telegramme from the President of the Republic of China, read out by Dr. Ho first in Mandarin, the official language, then in English for the guests. The scientific programme consisted of 4 symposia in the mornings, 2 evening symposia, 63 short communications, and about 90 posters touching on all aspects of copepodology.

The number of 70 participants from Taiwan came as a surprise. A "Directory of Asian Copepodologists" which we found in our conference bag listed 36. Most of them are very young. That is why we have not heard of them yet. Youth also dominated the social programme. Remember the dancers at the farewell banquet were school children, as were most of the members of the Joyous String Orchestra which gave a concert at the end of the first conference day. They played Bach, Händel, Schumann, Mozart, Mendelssohn, Holst and others and it is their music that goes through my mind when thinking back to the conference which thanks to Jiang, the local organizing committee and their helpers was a tremendous success. Imperceptibly the yellow balloon and the yellow copepod mingle with the music in my mind, the balloon representing the globe on which copepods play such a prominent ecological role.

— **Kurt Schminke**

Christmas Souvenir from the 8th International Conference on Copepoda NTOU, Keelung, Taiwan

It has indeed been a great honor and pleasure to host the 8th International Conference on Copepoda (8th ICOC) at National Taiwan Ocean University (NTOU), Keelung, Taiwan. There were about 300 participants (including 255 official registrants, some invited guests and audiences from the University) from about 50 countries.

We expect to receive a total of about 60 manuscripts to be considered for publication in the Zoological Studies (the proceedings of 8th ICOC). Professors Ju-Shey Ho, Chang-tai Shih and myself will be on the editorial board of a future issue of Zoological Studies (the proceedings of the 8th ICOC). Professor Ju-Shey Ho (Kai) will be in charge of the copepod manuscripts on the subjects of symbiosis, parasites, and aquaculture. Professor Chang-tai Shih will be responsible for the copepod manuscripts on the subjects of taxonomy, phylogeny, and evolution. I will be in charge of the copepod manuscripts on the subjects of ecology, behavior, and the rest. The review process will begin soon.

Although the conference has been over for three months, we are editing the videos and photo files from the 8th ICOC activities to be made into DVDs and CDs. They will be sent out as souvenir to each participant of the event before the end of November as a Christmas gift from the 8th ICOC. If you do not receive them before Christmas, please do not hesitate to contact us. Viewing the DVD shall bring memories of your wonderful time in Taiwan during the event.

In the meantime, on behalf of the organizing committee, we have the amount of USD$1200 ready to be transferred to the organizing committee of the next ICOC for the Best Student Presentation awards. We are waiting for Sami and Nejib to open an account for the 9th ICOC so we can send the money.

Finally, on behalf of the organizing committee, we would like to express our sincere gratitude to all our sponsors, National Taiwan Ocean University, National Museum of Marine Biology and Aquarium, National Science Council, Fisheries Administration, Environmental Protection Administration, Ministry of Education, Ministry of Foreign Affairs, National Center for Ocean Research and Keelung City Government, Taiwan. Thanks to the many helpers listed in the program book who made the 8th ICOC a tremendous success. Last but by no means the least, we feel an immense gratitude to the World Association of Copepodologists (WAC), without the support of WAC, it would have been impossible to hold the 8th ICOC in Taiwan. In order to keep communicating through website, we will keep the website http://8thicoc.ntou.edu.tw functioning as long as possible.

— **Jiang-Shiou Hwang**
Professor of Institute of Marine Biology
National Taiwan Ocean University
Keelung,Taiwan
— **On behalf of the Organizing Committee of the 8th ICOC, 2002**

Lifetime Achievement Award in Copepodology Presented to the former WAC President, Professor Ju-Shey Ho, by the 8th ICOC

Professor Ju-Shey Ho (Kai), former WAC president (1996-1999) has received numerous awards in his academic career. He has been the candidate for Academician at the Academia Sinica. Currently, there is only one Academician

in the field of Marine Biology in Chinese community globally. Kai passed a very crucial selection in the Chinese scientific community worldwide and became the official candidate for Academician. The most recent award conferred upon Kai was the Science and Engineering Achievement Award from the Taiwanese-American Foundation. Kai received the award in November 2001, eight months before the 8th ICOC. This award is considered as the Taiwanese equivalent to the Nobel Prize. Being a workaholic, Kai generally sleeps only four hours a day in order to catch up on all his work. He spends most of his time doing research and educating the next generation.

Kai is one of the most beloved Taiwanese scientists. He advocates Taiwan independence, and was therefore forbidden to visit Taiwan while it was still under martial law in the past few decades. In 1992, Kai was permitted to visit Taiwan for the very first time since he went to the USA in 1962. During this visit, he gave a very impressive speech at the Institute of Marine Biology, National Taiwan Ocean University (NTOU) in Keelung, Taiwan, where I was working at the time. He is a very well organized speaker with a good sense of humor. All faculty members and graduate students admired his wonderful speech. It was the first time I had met Kai. In 1998, I organized the International Symposium on Marine Biology in Taiwan while I was the director of the Institute of Marine Biology, NTOU. Kai, Drs. W.-T. Lo, M. Omori, C.-T. Shih, J. Turner, S. Uye, and C.K. Wong (in alphabetical order) and others were invited to give talks during the symposium. This was the very first time that we discussed the possibility of hosting the 8th International Conference on Copepoda (ICOC), during the post-conference tour. Kai and Chang-tai's decisions encouraged me to pursue this endeavor. He has been helping the organizing committee to host the 8th ICOC from the very beginning. Kai is famous not only in Asia but throughout the world as well in the field of copepodology. He has about two hundred academic publications. In early 2001, during a Local Organizing Committee (LOC) meeting, Chang-tai and the all local organizing committee members nominated Kai as a candidate for a Lifetime Achievement Award in Copepodology. I therefore wrote a letter to the president of WAC, Professor Geoffrey Boxshall (2000-2002) about this matter. Geoff fully supported this idea and the decision was made. We kept this decision as a secret. Kai was not aware of the honor to be awarded to him until the opening ceremony. When Geoff announced his name, Kai was very surprised by the unexpected award. Kai is one of the top copepodologists, an excellent teacher as well as a very impressive speaker. He is an excellent role model for young copepodologists, contributing all his life to the field. On behalf of the organizing committee, we would like to confer this honor to Professor Ju-Shey Ho. Our deepest and most sincere congratulations!

— Jiang-Shiou Hwang

On behalf of the Organizing Committee of the 8th ICOC

Training Workshop on the Morphology and Systematics of Copepods

It is imperative that suitable training is provided for the next generation of taxonomists and, as a contribution to the Global Taxonomy Initiative, the WAC decided to promote specialist training in copepod systematics by running a 5-day workshop held immediately prior to the Eighth International Conference in Taiwan. The first training Workshop on Morphology and Systematics of Copepods was held at the National Museum of Marine Biology and Aquarium (NMMBA) in Kenting, Taiwan, from 14th to 20th July 2002. The objective of the workshop was to provide participants with a comprehensive and state-of-the-art introduction to copepod morphology and systematics, plus training in the necessary technical skills.

The workshop combined lectures with laboratory-based practical sessions. The seven tutors (Ju-shey Ho, Rony Huys, Susumu Ohtsuka, Carlos Rocha, Grace Wyngaard, Sophie Conroy-Dalton and myself) introduced students to the morphology and anatomy of adults and developmental stages of copepods. They covered the morphology of each copepod order, and considered the typical range of species found in marine plankton, in marine benthos, in freshwater plankton and groundwater habitats, and as parasites of marine fish. In addition, we introduced the methods of molecular systematics and chromosome diminution techniques. The practical labs provided training on how to prepare, dissect, and examine copepods, using light microscopy. Students were asked to bring material with them that is of special interest or importance in their own work – particularly their problem species, difficult larval stages, unusual morphological structures they can't interpret, etc. The labs took the form of problem-solving workshop sessions and all tutors were in attendance for all of them.

I hope you are still reading after that rather dry factual summary, because we really had a fantastic time. Can you imagine what a wonderful opportunity it was to learn copepods from these tutors - my personal "dream team" for copepod systematics?

From a total of over 70 applications, we had selected 33 student participants from Taiwan, Korea, Japan, Philippines, Iran, Tunisia, Australia, USA, South Africa, UK, Hong Kong and Kenya. We had copepods to study from everywhere and all kinds of habitats. The large laboratory doubled as a lecture room (with excellent facilities) and as the course got going an intense group dynamic developed. You could look round the room and see little groups of students clustered around a tutor, looking down a microscope or watching a demonstration intently. Having an

idea is easy – delivering the product is always harder and I was delighted to see how well this group of young people from all continents mixed together. The tutors came with a wonderful open attitude which was the second vital ingredient to success. It was intense and hard work at times, but I honestly think we all enjoyed ourselves.

We would never have succeeded without the generosity and support of Prof. Jiang-Shiou Hwang in Keelung and Dr Wen-Been Chang at the NMMBA in Kenting. The local organisers excelled in their attention to every detail in planning a memorable week. All the participants would like to thank them and the NMMBA very much for their hospitality.

— Geoff Boxshall (Workshop Organiser)

Awards for Excellence in Student Presentations

A highlight of the Keelung Conference banquet was the awards for excellent presentations made to ten students participating in the 8th ICOC. Each student received a certificate and a monetary award of US$200 ($100 in cash and a rebate of the $100 student registration fee). The awards were funded primarily by the Local Organizing Committee, plus $200 from the WAC. Twelve volunteers, including the members of the WAC Executive Council as well as Ruth Böttger-Schnack, Shuhei Nishida, Mark Ohman, and Chang-Tai Shih worked hard to evaluate as many student presentations as possible during the course of the Conference. My special thanks to Ruth and to Susumu Ohtsuka for their valuable suggestions regarding procedure, and collaboration during the final phase of the evaluation.

The awards were based on the quality of the scientific information, and the clarity and effectiveness of the presentation. There was no distinction between poster and oral presentations. Our hearty congratulations to these talented and hard-working students, and to their coauthors and advisors. **— Jan Reid**

Deo Baribwegure, Laboratorium voor Ecologie der Dieren, University of Ghent, Belgium, "Revision and comparison of *Thermocyclops* with other cyclopoids by the use of integumental pore mapping" by D. Baribwegure & H.J. Dumont.

Wendy M. I. Bonne, Biology Department, University of Ghent, Belgium, "The importance of systematic knowledge in environmental monitoring programmes: copepod community analysis in the North Sea."

Kristine L. Grayson, James Madison University, U.S.A., "Embryonic duration and genome size in cyclopoid copepods" by K.L. Grayson, E.M. Rasch & G.A. Wyngaard.

Shih-Hui Hsiao, Institute of Marine Biology, National Taiwan Ocean University, Taiwan, "Temporal and spatial distribution of planktonic copepods in the Kuroshio Current, east of Taiwan" by S.-H. Hsiao, J.S. Hwang & C.-T. Shih.

Abigail L. Ingram, University of Oxford, U.K., "Biomimetic potential and functional ecology of the antennae of *Anthosoma crassum* (Abildgaard, 1794) (Dichelesthiidae)."

Ryuji J. Machida, Ocean Research Institute, University of Tokyo, Japan, "Gene rearrangements and some genomic characteristics in mitochondrial DNA of calanoid copepods" by R.J. Machida, U.M. Miya, M. Nishida & S. Nishida.

Hiroyuki Matsuura, Ocean Research Institute, University of Tokyo, Japan, "Reduced species diversity and peculiar vertical patterns in the deep-sea copepod genus *Euaugaptilus* in the Sulu Sea" by H. Matsuura, J. Nishikawa & S. Nishida.

Ai Nihongi, Great Lakes Water Institute, University of Wisconsin-Milwaukee, U.S.A., "Comparison of mate-searching behaviors between marine and fresh-water calanoid copepods" by A. Nihongi, S. Lovern, M.H. Doall, M. Uttieri, H. Lue & J.R. Strickler.

Shinya Okabe, Fisheries Laboratory, Hiroshima University, Japan, "An ecological study of copepods parasitic on puffer fish (*Takihugu niphobles*) in the Seto Inland Sea, Japan, with note on presence of tetrodoxin in copepods" by S. Okabe, S. Ohtsuka, K. Nagasawa, J.-S. Ho, K. Ito, M. Asakawa & K. Miyazawa.

Cheng-Han Wu, Institute of Marine Biology, National Taiwan University, "The feeding ecology of three *Oncaea* spp. in the northern South China Sea" by C.-H. Wu, J.S. Hwang & J.S. Yang.

Continuation of the Student Awards Programs

The members of the WAC Executive Committee strongly wish to continue to support young researchers, and to recognize their accomplishments. Accordingly, the EC and the Local Organizing Committee of the 9th ICOC in Tunisia intend to make available both travel grants and awards for student presentations to participants in the 9th ICOC. The numbers, amounts, and precise criteria for these awards will be announced in *Monoculus* and in the pre-conference circulars. On behalf of the Local Organizing Committee of the 8th ICOC, Jiang-Shiou Hwang has already donated

US$1,200 to this program. Our deep appreciation is extended to Jiang, his colleagues, and the Sponsors of the 8th ICOC, for their strong commitment to recognizing and encouraging younger colleagues.

— Jan Reid

WAC Financial Status

The WAC balance as of November 1, 2002 was $28,000.40 US Dollars. This is a significant increase since the spring statement. Due to the faltering US economy, our interest earnings are down to about 1.50% per year. If the US economy improves, this may return to the higher interest rates we enjoyed in the past. Dues payments can be made via mail to:

John A. Fornshell, Ph.D.
Paul VI Catholic High School
10675 Lee Highway
Fairfax, Virginia 22030, U.S.A.

— John Fornshell
Treasurer, WAC

Student Essays

It is important to hear from our younger colleagues. Here are essays from two of the recipients of the awards for Best Student Presentation at the Keelung Conference. Look for articles by other students in future numbers of *MONOCULUS*.

A few words after receiving the Best Student Presentation Award at the 8th ICOC held in Taiwan

I was so glad to receive the Best Student Presentation Award during the 8th International Conference on Copepoda (ICOC) held in Taiwan. To my knowledge, there were so many excellent talks and posters among the student community at the 8th ICOC. I did not think that I had any chance to win the award. It was indeed very unexpected and exciting.

I was so lucky to be able to participate in the preconference workshop at the National Museum of Marine Biology and Aquarium (NMMBA), Pingtung and the conference at the National Taiwan Ocean University (NTOU), Keelung, Taiwan. In the workshop program, I would like to express my gratitude to Professors Geoff Boxshall, Ju-Shey Ho, Rony Huys, Susumu Ohtsuka, Carlos da Rocha, and Grace Wyngaard. I have learned much state-of-art information on copepodology from their lectures on morphology, taxonomy, phylogeny, and ecology, including parasitic ecology, freshwater ecology, feeding ecology and biochemistry. We also had a practical training program daily. The preconference workshop enhanced my plan to learn copepodology.

Currently, I am a Ph. D. student at NTOU working with Dr. J.-S. Hwang. I was glad to attend the 8th ICOC at NTOU. If this conference had been held in any other country, I would not have had the chance to participate. I was so lucky to meet top copepodologists from every corner of the globe and listen to their talks for two weeks during the preconference and conference. Their impressive and informative talks stimulated much of my new thinking in doing research on Copepoda. Moreover, I had the opportunity to get to know many copepodologists, not only from their publications but also in person.

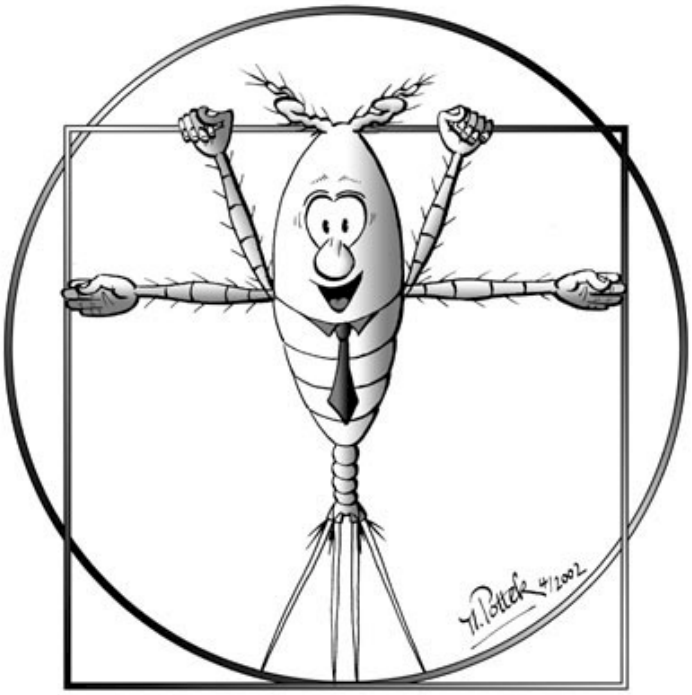
The title of my master's thesis is " The feeding ecology of three *Oncaea* spp. in the northern South China Sea". To receive the best student presentation award has inspired me greatly. I felt that all my previous hard work at the SEM laboratory and Professor Hwang's laboratory was worthwhile and recognized. I deeply appreciate my two advisers, Professors J.-S. Hwang and J.-S. Yang, for their very helpful guidance in research and even for acting as friends in my private life. In addition, I would like to give special thanks to Dr. J.-S. Ho, who made many constructive suggestions and modified the contents of my two posters to be presented at the 8th ICOC. I was so glad that the 8th ICOC was held in Taiwan so that I had the opportunity to attend the first and the most important conference in my academic career. The best student presentation award at the 8th ICOC let me believe that there is usually a reward for hard work.

— Cheng-Han Wu
Institute of Marine Biology
National Taiwan Ocean University

Best Student Presentation Award at the 8th ICOC held in Taiwan

It is a great honor to receive the Best Student Presentation Award from the 8th International Conference On Copepoda (8th ICOC). I am sharing this honor with my advisors, Professors J.-S. Hwang and C.-t. Shih. This award has further inspired my ambition to study copepods in my future academic career.

I just received my master's degree from the Institute of Marine Biology, College of Life and Resource Sciences, National Taiwan Ocean University. I presented two posters from my master's thesis at the Conference. The title of my thesis was "Temporal and spatial distribution of planktonic copepods in the Kuroshio Current, east of Taiwan".



Although the Kuroshio Current is a very well-known oceanic current in Asia, very little is known about its copepods' basic biology and ecology. Professors Hwang and Shih initiated this project and guided me to work on the ecology and taxonomy of marine planktonic copepods in the Kuroshio Current during my master's program. This was my first opportunity to meet so many copepodologists from all over the world during the 8th ICOC. I was so fortunate to attend the 8th ICOC and to have the opportunity to listen to a large number of papers delivered by world authorities in copepodology. This conference and the Best Student Presentation award have reinforced my wish to pursue copepodology for my future career. Currently, I am in the Ph. D. program working with my major professors Drs. J.-S. Hwang and C.-t Shih on the same subject, to fulfill my desire to study the basic biology and ecology of copepods around the waters of Taiwan. I feel it is a significant advantage to remain active in the World Association of Copepodologists, which is a forum for all people interested in different disciplines of copepod studies.

— Shih-Hui Hsiao
Institute of Marine Biology
National Taiwan Ocean University

An Interview with Dr Boxshall

The outgoing President of the World Association of Copepodologists Dr Geoff A. Boxshall is one of the longest serving and most active members of the association. During the just concluded eighth International Conference on Copepoda (8th ICOC) in Keelung, Taiwan, I was honoured with an interview with Dr Boxshall on behalf of the *MONOCULUS Newsletter*. Tracking down Geoff to grant me the interview was not such a difficult task since he is a very social and friendly person.

OSORE: As a world famous copepodologist, you are personally well known by many established workers both as a colleague in research and/or a friend. However, there are many others, especially young and upcoming copepodologists worldwide who have only heard your name and read your publications. For their benefit, kindly tell MONOCULUS about your professional background and how you developed interest in copepod research.

BOXSHALL: I was introduced to copepods by the parasitology lecturer, Dr Wynne Owen, at Leeds University. He was a lovely person who took a special field course devoted to fish parasites and whenever we encountered a bizarre or unrecognisable parasite he would say that it must be a copepod. This was enough to stimulate my curiosity so when I went on to study for my PhD, I asked Wynne to supervise me looking at the biology of parasitic copepods.

OSORE: You are one of the few members of WAC who have attended all the international conferences on Copepoda since the association's inception. Can you briefly describe to the readers of MONOCULUS what the trend has been over the year since the first meeting (1st ICOC) up to the present 8th ICOC in Taiwan and what you think have been the major milestones achieved.

BOXSHALL: Yes, I have been lucky enough to get to all the conferences. I probably should not say this but my most powerful memories are not of the science, but of meeting people and making new friends. My first conference was a rather nervous affair as I knew I would be talking to the great copepod researchers of that time. It was indeed the first time I met Jan Stock, Arthur Humes and Ju-shey Ho. The twin memories burned into my brain are the open discussion on the ancestral copepod and having dinner one evening at a restaurant in the red light district of Amsterdam, sitting at a table with George Grice, Kuni Hulsemann and Bruno Scotto di Carlo. I just could not believe that I was there with these great names from our copepod world.

I have dwelt too long on the first conference … but I was young and these people were my heroes. Since Amsterdam the trend has been to larger meetings. Our WAC has grown and we now have more parallel sessions. This is a matter of some regret for me because I find virtually every paper at a conference to be of interest and this forces me to make hard choices. We must strive to integrate our science across the traditional boundaries and I think the symposium topics should be chosen carefully to maintain the impetus towards further integration. The main milestones really have been the creation of the WAC which formally came into existence at the Third Conference in London, the dynamic of our regular conferences, the launching of the new workshop series

(which started in Brazil), and the launching of the new website.

OSORE: Your tenure as President of WAC has been described as very successful indeed and saw the introduction of student awards, substantial increase in membership from far and wide, maintenance of a healthy financial status, hosting of the WAC website etc. How did you and your team achieve all these?

BOXSHALL: Thank you! We had a fantastic Executive Committee (EC) during my tenure as President. It is a responsibility to be elected to office and every single elected member of the EC discharged his and her responsibilities to the utmost. Each elected member worked hard – in reality that means that these seriously busy people placed WAC tasks high up their priority list. It was my privilege to be part of such a group of committed individuals. So if we achieved a lot, then it was through hard work and real team effort.

At the end of the Curitiba conference our EC had its only full and face-to-face meeting. We collectively decided that, with $20,000 in the bank, the WAC could afford to initiate new programmes, if we were prudent. I should add that we were ONLY able to do this because of the secure financial situation handed on to us by the out-going president, Ju-Shey Ho, and his EC. We decided to invest in students, with bursaries and awards, and our big challenge was to do this without making the WAC financially insecure. We didn't want to raise the subscription, so we looked carefully at the value we were getting for our money in our other activities and we eventually decided to make some savings by moving towards a web-based Monoculus.

OSORE: What would you say were the major challenges that you faced during your term in office and how did you overcome them?

BOXSHALL: The main challenge was probably to get the website up and running. As the result of a mammoth amount of work, mainly by Rubens Lopes, we now have a website and I believe this will rapidly become a invaluable resource. It will continue to grow but Rubens, as website manager, needs help. So the challenge is still there – the WAC needs members to write articles of interest, to send information, prepare reference lists, job information, book adverts, hall of fame entries, workshop notices, links to other sites.

OSORE: The establishment of the WAC website and the introduction of an electronic version of the MONOCULUS were indeed some of the main achievements that punctuated your tenure in office. What benefits to copepodologists do you envisage that these new products will bring in the future? As Internet access still remains a major problem in many developing nations wouldn't it be worthwhile to still continue dispatching hard copies of the newsletter?

BOXSHALL: Our second challenge was to revise the production of Monoculus. The web is a highly cost effective means of publishing newsletters and I am truly delighted that Janet Reid will put her extraordinary energies into editing eMonoculus. We will, of course, produce a limited number of hard copies for those without internet access, but for most people the web-based version will deliver the goods faster.

OSORE: Yourself and other distinguished copepodologists conducted a very successful 5 days pre-conference training workshop on copepod morphology and systematics at Kenting in southern Taiwan. All the participants praised the workshop and said that, among other positive aspects, the event immensely enhanced networking amongst themselves and other copepodologists worldwide. From an instructor's perspective what lessons did you learn from this workshop and what future plans do you have in place for a continuation?

BOXSHALL: The pre-conference workshop was a wonderful experience. I have had lots of feedback from participants (both tutors and students) and it seems clear that we all enjoyed ourselves while achieving something valuable. I think such focused training is an important model for the future, because time is the limiting quantity for everyone. We evolved a more effective scheduling for mixing lab practical sessions and lectures during the week and the feedback session identified several small improvements we could make for next time. Also, I learned a lot about copepods from listening to the other tutors, who were, collectively, my "dream team" for copepod systematics. I must again pay tribute to Wen-Been Chang and our hosts at the NMMA in Kenting. They laid the foundations for the success of the workshop by providing the infrastructure and facilities so that we could concentrate on the copepods. There are no definite plans for the future but, given the opportunity and resources, I am certain that the need for such intensive training workshops is a great as ever.

OSORE: What major role would you say the younger copepodologists ought to play in order to alleviate taxonomic impediment and what kind of measures should now be put in place to achieve this?

BOXSHALL: The shortage of taxonomic expertise and the ageing of the taxonomic workforce have been identified as "the rate-limiting condition" for implementation of the Convention on Biological Diversity. Copepods are under-studied and the goal must be to stimulate interest, provide essential training and demonstrate the pivotal role copepods play in aquatic ecosystems. The future is in your hands although established workers must continue to fight their corner for taxonomy and fight to develop a fairer career structure for young scientists.

OSORE: Looking back at your three years as President of WAC, what would you say are your most memorable achievements and/or occasions?

BOXSHALL: My most memorable moments were in Taiwan. I enjoyed tremendously the task of preparing and giving the Maxilliped Lecture because my theme – the role of the WAC in fostering integrated science – allowed me to look back at my personal highlights for each conference. Equal to that was the student awards ceremony during the fabulous farewell banquet in Keelung. Together with Janet Reid, who had done such a great job organising the scheme, we were giving prizes to these talented young scientists. It was great to see the awards scheme come from original idea to reality

OSORE: Did you achieve your mission for WAC? As a former President, what now is your vision for WAC and what would you like to see accomplished by your successor.

BOXSHALL: I am proud to say that our EC achieved almost everything we set out to do. The one area where I did not put sufficient energy was to encourage a greater proportion of members to pay their dues. We started many new initiatives and I feel that I can now better answer the question "Why should I pay $20 to be a member of the WAC?" My reply is now that your $20 is used to support and encourage students to pursue excellence in their research on copepods, to financially assist some students to attend the conferences, to run a growing website that serves both as a means of communication between copepodologists and as a vehicle to promote copepod work, and to produce our new eMonoculus newsletter. I think we are offering better value for our members' money.

OSORE: What final message or general comment would you like to pass to the readers of MONOCULUS?

BOXSHALL: What first drew me into copepod research was sheer curiosity about these wonderful little animals. It is easy to lose sight of that when stuck in front of a computer or in a seemingly endless committee meeting. When the opportunity arises for me to look down a microscope at your *Candacia* or Joseph's *Copilia* or Salve's *Pseudodiaptomus*, it reminds me how much I enjoy research. So, that's my message, just try to remember how fascinating copepods are and how lucky we are to have the opportunity to study them.

— **Melckzedeck (Kizzie) Osore**

Kenya Marine & Fisheries Research Institute,

Mombasa, Kenya

The 9th International Conference on Copepoda (ICOC) will be held in Hammamet, Tunisia, July 11~15, 2005

A Message to Members and Friends of WAC

The World Association of Copepodologists (WAC) officially decided to hold its 9th Conference in Tunisia in 2005, during the business meeting at the 8th International Conference on Copepoda in Keelung, Taiwan. It is the pleasure of the International Organizing Committee for the 9th International Conference on Copepoda to extend its invitation to you all, members and non-members, to attend the Conference. Members of the Committee (in alphabetical order) are Drs Geoff Boxshall (U.K.), Mohammed Néjib Daly Yahia (Tunisia, co-chairman), Ons Daly Yahia-Kéfi (Tunisia), Jiang-Shiou Hwang (Taiwan), Rubens Lopes (Brazil), Laurent Seuront (France), and Sami Souissi (France, co-chairman).

This conference will be organized for the first time in Africa and for the first time in the Mediterranean, and also it is the first time that there are 2 co-organizers. Both Tunisian and French authorities and scientific institutions will host and support the 9th ICOC officially.

The 9th ICOC will be held in Hammamet, a very beautiful city of Tunisia, from 11th to 15th July 2005. The professional company 'Tunisie Voyages', specialised in organizing national and international conferences, will take charge of the organization of the 9th ICOC. This will be a good guarantee for efficient organization and will give us more time to focus on the organization of the scientific program. The conference will take place in the five-star Golden Yasmin, Mehari Hotel, which will offer all facilities for participants. You can find more information about the company 'Tunisie Voyages' and the hotel at the following websites:
http://www.tunisie-voyages.tourism.tn
http://www.goldenyasmin.com/hammametmehari/en/index.htm

A logo and a website for the 9th ICOC will soon be created. The address of the website will be announced in the next issue of *MONOCULUS*. All future announcements will be available from the website as well as from *MONOCULUS* and the WAC website. We look forward to meeting you all at the 9th ICOC in 2005 in Tunisia.

Sami SOUISSI (co-chairman) and Mohammed Néjib DALY YAHIA (co-chairman) and Local Secretaries

WAC By-Laws

The "By-Laws" establishing the World Association of Copepodologists and governing its operations were originally approved by a majority of the members present at the 3rd International Conference on Copepoda in 1987. Certain amendments were later approved at the 6th ICOC at Oldenburg in 1996. Three additional changes were approved at the 8th ICOC at Keelung in 2002. The latest changes added one additional elected Council member and instituted the post of Past President (Articles 3 and 7), and shortened the nomination period for officers from six months to two months in advance of each election (Article 7). The Past President, Geoff Boxshall, discussed the reasons for the most recent changes in the appended section on "Approved amendments to the WAC By-Laws." The current version of the By-Laws is as follows:

By-Laws of the World Association of Copepodologists

Name

The name of the association shall be The World Association of Copepodologists, hereinafter referred to as the WAC.

Purpose

The general objective of the WAC shall be the promotion and support of interest in all aspects of research on Copepoda.

BY-LAWS

Article 1: Membership

Any person interested in any aspect of the study of Copepoda is eligible for membership of the WAC. Applicants for membership must be nominated by two members of the Association. The nomination is sent to the Executive Council for approval. The approval of the Council confers on the applicant the status of a candidate member. A list of candidate members shall be presented by the Executive Council to the membership during the business meeting of the WAC, to be ratified by its quorum (defined for the purpose of this statute as at least 30 active members in addition to the officers of the Council). Candidates not so approved will be informed by the General Secretary in writing. Should the period between a membership application and the next business meeting exceed three years, the approval of candidates will be carried out by mail.

Article 2: Governing body

The governing body of the WAC shall be the quorum of membership assembled at business meetings during periodic symposia. Should such meetings be impossible, the membership shall exercise its authority by mail ballot, organized by the Executive Council.

Article 3: Officers

The officers of the WAC shall be: a President, a Vice-President, a Past President, a General Secretary, a Treasurer, a Local Secretary and up to five Members, comprising the Executive Council. The term of office of all officers will be coincident with the interval between two successive meetings of the WAC. The Local Secretary will not be an elected officer, but be appointed by the Executive Council. After completion of one elected term as President, the President will serve a second term as Past President. At each meeting half of the slate of officers shall be replaced. All officers of the Executive shall be eligible for re-elections. The first slate of officers shall be appointed by the Founder-President. The first meeting shall elect a new President, General Secretary, Treasurer and two Council Members, to stagger the terms of office and to ensure the continuity of the Executive Council.

Article 4: Executive Council

The Executive Council shall determine general policy on the basis of input from the membership and shall conduct the business affairs of the WAC. The Executive Council is chaired by the President of the WAC. In his absence, the Council is chaired by the Vice-President and in hisabsence by the General Secretary.

Article 5: The Treasurer

The Treasurer shall keep the financial records of the WAC and shall present an annual report at the end of each calendar year to be included in the first issue of the newsletter of the succeeding year.

Article 6A: The Local Secretary

The Local Secretary shall be appointed by the Executive Council during the WAC meeting from among members living in the locality designated as the venue for the next meeting. The Local Secretary shall take a leading role in organizing that meeting, in close cooperation with the President and the Executive Council.

Article 6B: The General Secretary

The General Secretary shall prepare and receive applications

for membership and assist the President in running the WAC.

Article 7: Nominations

Nominations for any office, with the exception of those of the Local Secretary and Past President, may be made in writing by any two members of the WAC in good standing not later than two months in advance of an election. The proposer must ascertain that each candidate is willing to stand for office and serve if elected. Additional nominations may be made by a Nomination Committee appointed by the Executive Council and during business meetings of the WAC.

Article 8: Elections

Elections shall be conducted by direct ballot at the business meetings of the WAC. Should the interval between meetings exceed five years, the Executive Council shall arrange a mail ballot election. In that case the Executive Council shall mail ballots to the membership in an issue of the newsletter before October 1 in the election year. A brief biographical sketch of each candidate shall accompany the ballots. The Executive Council shall appoint a scrutinizing committee of three to count and record votes received by November 1. The candidates receiving the greatest number of votes shall be elected. When the vote results in a tie, the Executive Council shall vote to resolve it. Should a tie still persist, the President shall cast the deciding vote.

Article 9: Finance

The expenses of the WAC shall be paid from the funds of the WAC, within the limits of its budget. The capital and income of the WAC shall be devoted solely to the furtherance of the objectives of the WAC, as stated in its constitution.

Article 10: Dues

The annual dues shall be fixed by the Executive Council. They shall be payable in the currency used by the treasury of the WAC or by International Money Order in advance before January 1 to the Treasurer. Dues may be paid two years in advance. At the discretion of the Executive Council, dues of some members may be waived or reduced.

Article 11: Newsletter

The WAC shall publish a newsletter entitled MONOCULUS. This newsletter shall be published at least once a year. The responsibility for its publication shall devolve upon an Editor, appointed by the Executive Council for a period equal to the interval between successive meetings. The Editor may be one of the officers of the Executive Council and shall be eligible for re-election.

Article 12: Meetings

The WAC shall sponsor an international symposium every three years, if possible. The purpose of these conferences shall be the promotion of the Association's objectives. They will also provide a platform for the conduct of the Association's business, including nomination and election of officers, adoption of by-laws and amendment of the constitution and/or by-laws. All business decisions shall be taken by the vote of the membership quorum. Financial responsibility for the conferences shall rest with the local organizers.

Article 13: Amendments

The constitution and by-laws of the WAC can be amended only by two-thirds majority of members in good standing present at a business meeting or voting in a mail ballot. Amendments may be proposed by any two members in writing to the General Secretary for the appropriate transmission to the membership.

Article 14: Dissolution

In the event that WAC is dissolved for any reason, the surplus funds remaining after payment of debts and liabilities shall be transferred to some institution or organization approved by the Executive Council that has objectives similar to those of the WAC. Any outstanding liabilities at dissolution shall be shared equally among the members.

Mikhail Vladimirovich Heptner

16 November 1940

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21 July 2002

The eminent Russian oceanographer and copepodologist Mikhail Heptner passed away in July. A full obituary will appear in the next number of *MONOCULUS.*

New Books

The Copepodologists's Cabinet: A Biographical and Bibliographical History By David M. Damkaer

Memoirs of the American Philosophical Society, Philadelphia, Pennsylvania, Volume 240, I-xix, 300 pp., index. 26 x 31 cm (10 by 12 inches).
ISBN: 0-87169-240-6. (2002) US$60 hardcover.
http://www.aps-pub.com/catalog2002.htm

Copepods have been known since the time of Aristotle, yet this book is the first history to be written about the study of these small marine crustaceans. This large-format volume, the first of three, reviews the early period of copepod discovery until 1832. The author presents biographical histories of copepodologists in their social and historical context. Their biographies are necessarily uneven in nature, as little is known of some workers whereas a great deal is known about others irrespective of the size or significance of their contributions.

David Damkaer has given us what amounts to a labour of love, containing biographies of some 90 workers from the period of 384 B.C. to 1832 as well as portraits of many of them. The book has 15 chapters starting with Aristotle (384-322 B.C.) who remarked that "tuna and swordfish are tormented as a dog by a gadfly, by a worm under the fins, which looks like a scorpion, has the size of a spider, and causes such anguish that not infrequently the swordfish jump out of the water like dolphins, even falling into the boat." The second chapter is devoted to the importance of the development of the microscope, a necessary technological development before the study of these small animals could really get going; the first practical instruments were not available until the early 1600s. A description of the progress of discovery and understanding follows. This progress was at times halting, as the importance of some discoveries were overlooked or misunderstood. For example, Jacques Simon Amand Suriray (1769-1846) was the first to describe a newly hatched larva of lernaeids that resemble the young of *Cyclops*. Nevertheless, other workers in the decade following 1819 were slow to grasp that parasitic forms should be integrated into classifications with the free-living copepods. Chapter 13 reveals how this man's social position and the accidents of publication resulted in his work almost being overlooked.

Damkaer has not restricted himself to events in the study of Copepoda, but frames his account in the context of zoological classification and the classification of Crustacea in particular. Numerous fascinating stories are told. One, that particularly appealed to the reviewer, was recounted in the section dealing with the life and times of the Norwegian zoologist Johan Ernst Gunnerus 1718-1773. In 1771, Gunnerus was called to Copenhagen by Johan Fredrich Struense, Denmark's Minister of State, who wanted to reform the universities. Gunnerus announced that the plans were impractical and returned to Trondheim in 1772. Struense's reforms were so unpopular that he was later forced out of office by a conspiracy of nobles, tortured, then beheaded!

Key events in copepodology are identified: the first description of a copepod (about 350 B.C.), the first illustration (1554), the discovery of the first free-living freshwater copepod (1688), the first observation of the metamorphosis of a free-living copepod (1756), the first copepod to be permanently named (1758), the first description of a free-living marine copepod (1770), and the first observation of a parasitic copepod's metamorphosis (1819). Volume 1 ends at 1832, the time when free-living copepods (previously thought to be insects) and parasitic copepods (earlier thought to be molluscs or worms) were finally recognised as members of the Class Crustacea. The epilogue contains an account of the transition to the nineteenth century and the "Golden Age of Copepology" in the 1890s, the subject of Volume 2. The third and final volume will cover the period up to the 1950s.

The book is well written, beautifully illustrated, and elegantly produced. In addition to the numerous portraits, facsimiles of title pages of historic documents and historic illustrations of copepods and other crustaceans, some of them in colour, are included. The book refers to what the author calls "cornerstone" papers in the bibliography as well as some literature that has been previously overlooked. An index, although not exhaustive, helps the reader to navigate the key subjects covered.

For those of you who need to authenticate early events in the taxonomy of Copepods (for example the correct date of publication of the description of *Calanus* Leach, 1819), who enjoy history, and get pleasure from owning a really beautiful book, I can thoroughly recommend it to you.

— Janet Bradford-Grieve
NIWA, Wellington, New Zealand

Modern Approaches to the Study of Crustacea Edited by Elva Escobar-Briones and Fernando Alvarez

Kluwer Academic/Plenum Publishers, 376 pp., Hardbound.
EUR 158.00 / USD155.00. ISBN 0-306-47366-6

This is the proceedings volume of The Crustacean Society 2000 Summer Meeting, held in Puerto Vallarta, Mexico. It contains 46 articles, 5 of which treat some aspect of copepods. There are extensive subject and systematic indexes. From the publisher's notes: 'This volume is organized in four sections: physiology, ecology, conservation and biodiversity, and systematics and evolution. Composed of 46 chapters and written by 100 authors from 17 countries, the volume reflects the truly international nature of the Crustacean Society. It will be a staple for researchers and scientists in the field."

A Guide to Tropical Freshwater Zooplankton Identification, Ecology and Impact on Fisheries

Edited by C. H Fernando

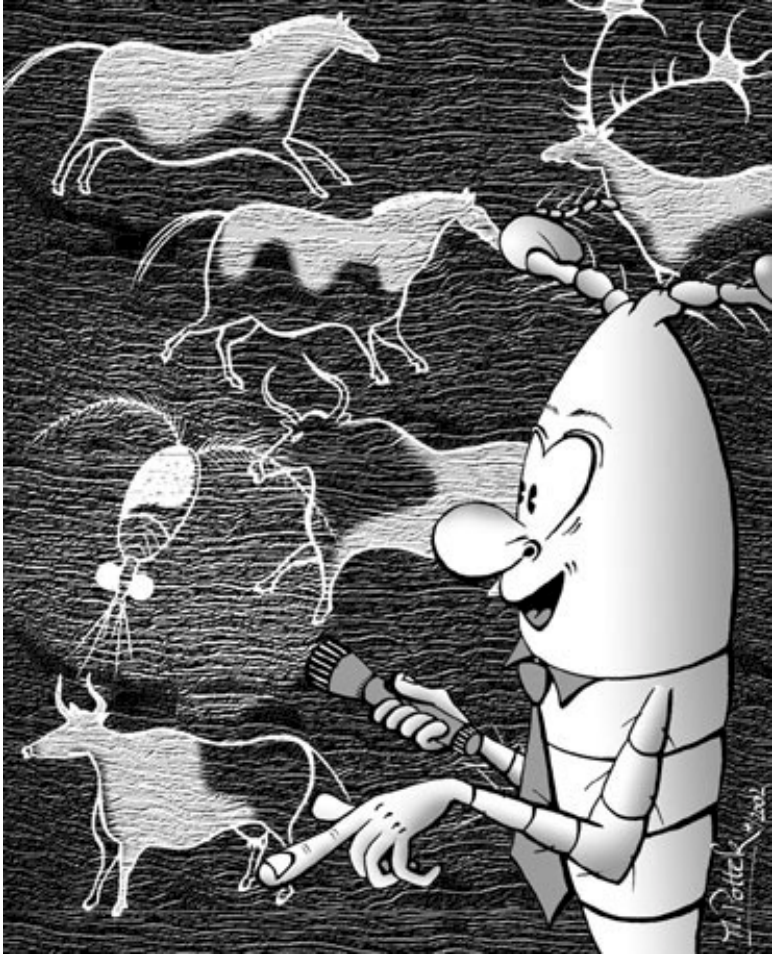
with contributions from L. A. Kutikova, V. Korinek, Z. Brandl, R. Victor and V. R. Alekseev

2002, xvi and 292 pages with 121 plates (1119 figures) and 10 tables. Paperbound. ISBN 90-5782-117-6. EURO 80.00/US$ 80.00. Backhuys Publishers, P.O.Box 321, 2300 AH Leiden, The Netherlands. Fax: + 31-71-5171856, E-mail: backhuys@backhuys.com, WWWeb: www.backhuys.com. Price in Euro is definitive, the US$ price is approximate. Postage and handling are extra. Books will be sent surface mail. For our E.C. customers: price is excl. 6% BTW/VAT/TVA/IVA.

From the Publishers' brochure: "This is the first comprehensive book on Tropical Freshwater Zooplankton. It covers the whole spectrum of Tropical Freshwater zooplankton and includes the unconventional group, the Ostracoda. One chapter is devoted to miscellaneous groups like *Chaoborus,* Hydracarina, Protozoa and some others that occur from time to time in freshwater zooplankton. Another chapter, on the interactions of zooplankton and fisheries, should make the book more useful to tropical fish culturists and fishery biologists. The authors of the chapters on the different groups of zooplankton and fisheries are authorities in these fields. The authors have also collaborated with the leading researchers in the field from all continents and this work has benefited from input of both younger scientists and senior collaborators working closely with the authors in laboratories worldwide.

The text is written clearly and concisely in as simple a way as the material permits so that it can be used by workers who are not specialists in zooplankton, and in developing countries. However, the material is comprehensive, authoritative and up to date. The book is profusely illustrated with 121 plates (1119 line drawings) and should enable users to obtain reliable diagnoses to species level in many cases and also glean basic ideas about methodology, ecology, zoogeography and classification. The book, though written by six authors, is completely integrated as a guide to Tropical Freshwater Zooplankton.

This book should be of use to a wide variety of freshwater biologists, both beginners and those already working in the field for some time. There is much material that is relevant and up to date, some of it that is not familiar to many students in the field. The literature coverage is designed to give a wide perspective of research in the field without attempting to be exhaustive. Key references are included so that the user can access almost all the literature in the field but with special reference to the tropical region. This book should be on the shelf of individual workers in zooplankton and especially in laboratories where work on freshwater ecology and systematics of the fauna is being carried out. Libraries should have a copy available as a general reference for freshwater biologists. Researchers and students of freshwater zooplankton, fishery scientists and fish culturists in tropical regions will benefit from this wide-ranging book."



Sri Lanka Freshwater Fauna and Fisheries
By C. H. Fernando and S. R. Weerewardhena

634 pp. 2002, ISBN 955-97697-0-7. Volumes Publishing, Kitchener, Ontario N2B 2B9, Canada. Can be ordered directly from the Publisher on payment in US funds www.volpub.com (Visa and MasterCard) US $55 or 1400 rupees in Sri Lanka (both including postage) from <chfernan@sciborg.uwaterloo.ca> FAX (519) 746 0614 or <zoosrw@kln.ac.lk> FAX 94 1 911 916.

From the Publishers' brochure: "This weighty quarto-sized tome is essentially a collation made from photocopies of many papers published by Herbert Fernando and his associates from 1956 to 2002 on the fauna and fisheries of his birthplace Sri Lanka (Ceylon), during his long professional career, most of which was lived away from that idyllic island. It has two main themes.

The first centers around his original 1962 Guide to the Freshwater Fauna of Ceylon and its several subsequent supplements. These often stress particular groups on which further work had been done; and they have been accompanied by other papers dealing with particular groups, such as rotifers and parasitic copepods. Several of these additions have enrolled the help of international experts in the groups considered. Throughout the text there are identification keys and abundant illustrations to help with identifications, and there are long lists of references. Also, beginning on page 423, there is an index to the invertebrates and vertebrates mentioned throughout the preceding composite text. So the whole compendium is, in effect, an excellent introduction to the freshwater fauna of southern Asia.

The second theme deals with the freshwater fishes and fisheries of Sri Lanka, with particular emphasis on the fisheries of and the potential provided by the reservoirs, which in that island of rice fields are abundant and widespread. This section also provides many maps and photographs, although the latter have not reproduced as well as the line and stipple drawings in the invertebrate documents. It also deals with such topics as the feeding of fishes, the introduction of alien species and other concerns involving production of food fishes in the tropics.

Thus, although the reader will have to learn to navigate through the text, the book is a library on the freshwater fauna of the island, and it offers an introduction to the fauna of the southern part of Asia, making keys to and access to the literature on freshwater invertebrates and many aspects of fisheries in a wide area. I anticipate that it will serve as an entry point into much further work, just as, for example, did Die Süsswasserfauna Deutschlands, the Scientific Publications series of the Freshwater Biological Association, and the book Australian Freshwater Life by the late W.D. Williams did for Germany, Britain and Australia respectively. It can also provide good information for anyone thinking of moving fish species around the landscape. Here, in North America, there is a tendency to regard any introduction of an alien species as a bad move, viz. the zebra mussel and the so-called Asian carp. The Sri Lanka experience seems to be different, and this may have some beneficial effect on the thinking on this continent, where, lets face it, only the turkey among our domestic animals is a native. We, as aliens ourselves including the Amerindians, would be in trouble without most of our food plants and nearly all of our animals. — By H.B.N. Hynes, Distinguished Emeritus Professor, University of Waterloo, Canada"

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Recent Publications on Copepoda

Compiled by Chad Walter
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1999

Bassani, C., A.C.T. Bonecker, S.L.C. Bonecker, C.R. Nogueira, J.M.L. dos Reis & L.R. Nascimento. 1999. Plancton do litoral norte do estado do Rio de Janeiro (21°00' a 23°30'S) - analise e sintese do conhecimento. In: Silva, S.H.G. & H.P. Lavrado (Eds.). Ecologia dos Ambientes Costeiros do Estado do Rio de Janeiro. Serie Oecologia Brasiliensis, Vol. 7. PPGE-Universidade Federal do Rio de Janeiro, Rio de Janeiro. Pp. 99-120. (Portuguese)

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Temporary Address for General Secretary

Until 1 September 2003, Eduardo Suárez-Morales' postal address is:

Smithsonian Institution
PO Box 37012
NMNH, MRC-163
Washington DC 20013-7012, U.S.A.

Correspondents may continue to address e-mail messages to Eduardo at: esuarez@ecosur-qroo.mx.

Address Changes

Maria Cristina Bruno
Aquatic Ecologist
South Florida Natural Resources Center
Everglades National Park
40001 State Road 9336
Homestead FL 33034, U.S.A.
Tel. +1 305 242 7896
Fax. +1 305 242 7836
E-mail: Cristina_Bruno@contractor.nps.gov

Jeffery R. Cordell
Wetland Ecosystems Team
Fishery Sciences, Box 355020
1122 Boat Street
University of Washington
Seattle WA 98195-5020, U.S.A.
Tel. +1 206 543 7532
Fax. +1 206 685 7471
E-mail: jcordell@u.washington.edu

Santiago Gaviria
Fred-Raymondgasse 19 / 2 / Top 4
A-1220 Vienna, Austria
Tel. +43 1 2855246
Laboratory +43 1 7261576
E-mail: santiago.gaviria@univie.ac.at

Samuel Gómez
Instituto de Ciencias del Mar y Limnología
Unidad Académica Mazatlán
Joel Montes Camarena s/n
82040, Mazatlán, Simaloa, Mexico
Tel: +52 669 985-28-45, Ext. 226
Fax: +52 669 982-61-33
E-mail: samuelgomez@ola.icmyl.unam.mx

Alberto Pilati
Department of Zoology
Pearson Hall 212
Miami University
Oxford OH 45056-1400, U.S.A.
Tel. +1 513 529 3100
E-mails: albertopilati@yahoo.com.ar, pilatia@MUOhio.edu

Janet W. Reid
Research Associate, Division of Science & Learning
Virginia Museum of Natural History
1001 Douglas Avenue
Martinsville VA 24112, U.S.A.
Tel. +1 276 656 6719
Fax. +1 276 656 6701
E-mail: jwrassociates@sitestar.net

Soultana Zervoudaki
National Center for Marine Research (NCMR)
Institute of Oceanography
PO Box 712, 19013 Anavyssos, Greece
Tel. + 30 2910 76375
Fax. + 30 10 9833095
E-mail: tanya@ncmr.gr

WAC Executive Committee

2002-2005 Term

President: H. Kurt Schminke
Universität Oldenburg
Fachbereich 7, Biologie
Postfach 25 03
D-26111 Oldenburg, Germany
Tel. +49 (0441) 798-3374; Fax + 49 (0)441 798-3162
E-mail schminke@uni-oldenburg.de

Past President: Geoffrey Boxshall
Department of Zoology
The Natural History Museum
Cromwell Road, London SW7 5BD, U.K.
Tel. +44 171 938 9489; Fax. +44 171 938 9158
E-mail G.Boxshall@nhm.ac.uk or gab@nhm.ac.uk

Vice President: Shin-ichi Uye
Faculty of Applied Biological Science
Hiroshima University
Kagamiyama, Higashi-Hiroshima 724, Japan
Tel. + 81 22 7111; Fax. +81 824 22 7059 or 824 22 7067
E-mail suye@ue.ipc.hiroshima-u.ac.jp

General Secretary: Eduardo Suárez-Morales
ECOSUR, El Colegio de la Frontera Sur - Unidad Chetumal
Apartado Postal 424
Chetumal, Q. Roo 77000, Mexico
Tel. +52 91 983 21666, 20447, 20076
Fax. +52 983-20447 or 983 25127
E-mail esuarez@ecosur-qroo.mx
[Temporary postal address through 1 September 2003:
Smithsonian Institution
PO Box 37012
NMNH, MRC-163
Washington DC 20013-7012, U.S.A.]

Treasurer: John A. Fornshell
Pope Paul VI Catholic High School
10675 Lee Highway
Fairfax, Virginia 22030-4314, U.S.A.
E-mail johnfornshell@hotmail.com

Executive Council Members:

Janet Bradford-Grieve
National Institute of Water & Atmospheric Research
Box 14901
Kilbirnie, Wellington, New Zealand
Tel. +64 4 386 0300; Fax. +64 4 386 2153
E-mail j.grieve@niwa.cri.nz

Jiang-Shiou Hwang
Institute of Marine Biology
National Taiwan Ocean University
Keelung, 202, Taiwan, Republic of China
Tel. +886 2 2462 2192*5304; Fax. +886 2 2462 9464
E-mail Jshwang@mail.ntou.edu.tw

Rubens M. Lopes
University of São Paulo
Oceanographic Institute
Dept. of Biological Oceanography
Praça do Oceanográfico 191
São Paulo, SP 05508-900, Brazil
Tel.: +55 11 3091 6556; Fax. + 55 11 3091 6607
E-mail rmlopes@usp.br

Mark D. Ohman
Integrative Oceanography Division
Scripps Institution of Oceanography
University of California San Diego
La Jolla, California 92093-0218, U.S.A.
Tel. +1 858 534 2754; Fax. +1 858 822 0562
E-mail mohman@ucsd.edu

Jefferson T. Turner
Department of Biology
University of Massachusetts Dartmouth
North Dartmouth, Massachusetts 02747, U.S.A.
Tel. +1 508 999 8229; Fax. +1508 999 8901
E-mail jturner@UMassD.edu

Local Secretaries, 9th ICOC:

Mohamed Néjib Daly Yahia
Laboratory of Hydrology and Planktonology
University of Sciences of Bizerte
7021, Zarzouna, Bizerte, Tunisia
Tel. +216 71 591 906; Fax. +216 71 590 566
E-mail dalyyahya.ons@inat.agrinet.tn

Sami Souissi
Marine Station of Wimereux-CNRS
University of Sciences and Technologies of Lille
BP 80, Wimereux 62930, France
Tel. +33 321 992 901; Fax. +33 321 992 908
E-mail Sami.Souissi@univ-lille1.fr

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C. B. Wilson Library: C/o T. Chad Walter, Smithsonian Institution, PO Box 37012, NMNH, MRC-163, Washington DC 20013-7012, U.S.A.