



MONOCULUS Copepod Newsletter

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Message from the President

Dear copepodologists:

There are several cherry trees in my back yard. The blossoms finished a few weeks ago and are replaced by new leaves of a light-green color comfortable to my eyes. In May, most trees are covered with shimmering green leaves and emit an aroma to the surrounding air.

In this most pleasant month of the year, I will greet more than 450 zooplanktologists from 54 countries attending the Fourth International Zooplankton Production Symposium (ZPS, from May 28 to June 1 at the Hiroshima International Conference Center). The focus of the symposium is "Human and climatic forcing of zooplankton populations", largely reflecting our current concerns about global warming, climate change, coastal ecosystem degradation, decrease in fish catches, etc. The first symposium was held in Denmark back in 1961, the second in the UK in 1994, and the third in Spain in 2003. This fourth one is the first to be held in Asia, which is very timely since the change and degradation of the marine ecosystem are very rapid and serious in some regions here.

I find that more than half of the presentations are related to planktonic copepods. Hence, this symposium provides a nice opportunity for the WAC members to meet each other before our tenth ICOC next year in Pattaya, Thailand (see page 2). I warmly welcome the WAC members to Hiroshima.

The number "four" may be a magic number for me, since I was asked to organize the "fourth" ICOC in Karuizawa in 1990 as well as the "fourth" ZPS in Hiroshima this time. Most Japanese dislike "four", like "13" for most westerners, because of a similar Japanese sound for "four" and "death". Hence, we have no number-four rooms or fourth floor in Japanese hospitals. We are mortal and death is unavoidable. The obituary of Kuni Hulsemann by Ruth Böttger-Schnack (see page 4) depressed me much in particular, since I shared a room with her in the late Abe Fleminger's laboratory when I was a visiting student at Scripps, and she stayed at my home after the Karuizawa Conference. Kuni is gone like the beautiful blossoms are gone.

— Shin-ichi Uye, President
Hiroshima University, Japan



10th International Conference on Copepoda Second Announcement

Dear copepodologists,

I am pleased to inform you that the 2nd Announcement of the 10th International Conference on Copepoda (10ICOC) has already been posted at <http://www.champa.kku.ac.th/10ICOC/>.

The Asia Pattaya Beach Hotel has been selected as the Conference Hotel. All future announcements will be available from this web site.

I look forward to meeting you at the 10th ICOC in July 2008 in Pattaya, Thailand.

With my best wishes,

— La-orsri Sanoamuang
Chairperson
Local Organizing Committee
E-mail: la_orsri@kku.ac.th

**New Journal Website:
Oceanological and Hydrobiological
Studies**
<http://www.oandhs.org/index.php>

We would like to welcome everyone who is interested in our new site, this site is dedicated to a peer-review of the scientific quarterly "Oceanological and hydrobiological studies", published in the English language by the Institute

of Oceanography of Gdańsk University.

This service contains all the necessary information concerning the periodical; it consists of almost 40 years of history; which provides the information necessary to prepare articles in accordance with our guidelines. This also relates both to the most recent and archival articles in PDF format published since 2003. Our objective is to create a service concentrating not only on our quarterly, but also containing a compendium of information, from all over the world, concerning hydrobiological sciences, chemistry, physics, and the hydrogeology of freshwater and saltwater bodies. We are sure that this service will be successful, due to a combination of input, ideas and of suggestions from ourselves, from our readers, and of the Editorial Committee.

— From the journal website

Copepod Culture Data Base

Despite the clearly established fact that copepod cultures play a crucial role for studying our favourite crustaceans, a lack of sharing animals and knowledge in this field still remains. To face this problem, the idea of creating a copepod culture data base arose and was discussed during the workshop entitled "Training Course in the Biology and Systematics of Copepods", 4th-8th July 2005, University of Bizerte, Tunisia (9th ICOC). A website was released this month at the following address:

<http://copepod.ruc.dk/main.htm>

Its primary goal is to offer an efficient communication tool for sharing copepods and knowledge concerning culture techniques. The final objective is to provide researchers with easy-to-access information for launching their own copepod culture and/or for comparing strains from different geographical origins. Also, it should help researchers working on the same species to share small tricks about cultivation. The web site features two principal sections dealing with copepod cultures.

- The first one is a list of cultures that are run on a regular basis in different institutes; this list is not exhaustive and everybody is more than welcome to add his own culture to the list by contacting us. The cultures are posted with the following information:

- Genus/ species
- Identification method (Genetics or morphology)
- Geographical origin
- Date of isolation of the strain (how many individuals?)
- Culture conditions (Temperature, Salinity, light regime, storage of eggs or not ... etc.)
- Institute name
- Contact person with a valid Email
- And other data which seem important to you, such as,

for instance, some references to articles where your cultivation methods are described.

- The second principal section presents a non-exhaustive list of references, also waiting for further postings. So far, we have posted around twenty interesting and useful resources.

Our newly launched communication initiatives will serve all copepodologists dealing with copepod cultures, if the community takes an active part in the existence of the data base and its continuous improvement. Therefore, we invite you to have a look at the website, and to send your contributions. Guillaume Drillet (gdr@difres.dk) and I (d94340006@mail.ntou.edu.tw) will be delighted to assist you in enriching any section of the copepod culture website.

We congratulate "G" on the launch of his preliminary copepod culture website and invite you to visit it.

— Gaël Dur, Ph.D. student
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by Tagea Björnberg, January 2007

Roscoff Plankton*Net website

We are happy to announce the launch of the Roscoff Plankton*Net web site following the first node @ AWI. The Plankton*Net network aim is to provide an easy to use portal for plankton taxonomists, ecologists and data managers worldwide.

Each site contains collections of plankton images, taxonomic descriptions and other information assembled by

local site owners. External contributors can also add their data to one of the existing PLANKTON*NET nodes.

Registration is very easy and you can start right away to add your own images to the web site and to use the communal environment.

Plankton*Net @ Roscoff web site:
<http://planktonnet.sb-roscoff.fr>

The Aquatic Microbe Forum hosts a special bulletin board dedicated to Plankton*Net:

http://aquatic_microbes.sb-roscoff.fr/index.php?board=31.0

Please contribute ...

— Daniel Vaulot
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email: vaulot@sb-roscoff.fr
Plankton group: <http://www.sb-roscoff.fr/Phyto/>
Roscoff Culture Collection: <http://www.sb-roscoff.fr/Phyto/RCC/>
Plankton*Net: <http://planktonnet.sb-roscoff.fr/>
Marine Microbes Forum: http://www.sb-roscoff.fr/marine_microbes/

Arthropod Literature Database University of Ulm

Papers can be searched for in my web-based arthropod literature database (also other animals and stuff too). Just saw that we have almost 13.400 papers in our db, virtually all as hardcopies since we do not collect just references.

This service is still available and free for all.

Just open <http://biosys-serv.biologie.uni-ulm.de/> go to "unsere Arthropoden-Literatursammlung". You can search in different fields such as author, year, title, reference, sytsematics and keywords. The Keywords are still a little German-dominated but we have a translator running and will slowly but progressively include more English. Note: an asterix can be used as a "wildcard". For example my family name is Waloszek or Waloßek, but in older literature is written Walossek. So searches for Walos*ek will find all references (including those of my brother Gerd....).

Cheers, DIETER
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Kunigunde (Kuni) Hulsemann
1927 - 2006

Kunigunde Hulsemann, a copepod taxonomist, known to her colleagues and friends as “Kuni”, died on 23 November 2006 at the age of 79.

Kuni was born in Krefeld on 21 October 1927; her maiden name was Kunigunde von Pfeffer. She graduated from the University of Munich in 1951. During her studies she developed an interest in ornithology and spent two years as a postdoc at the Helgoland Ornithological Station in Wilhelmshaven, a small city near the North Sea coast. She studied the behaviour of the Common Gull, which breeds mainly around the Baltic Sea, and she very much enjoyed life as a field ornithologist. Staying outside was natural for her, and she also spent one gull-breeding season on Mellum, a small island in the North Sea.

In 1955 she married. Her husband Jobst was a geologist who worked for a geophysical company, exploring for oil and salt domes in different locations. For the next three years she moved about with him to various places in northern Germany and southern France. In 1958 they moved to the United States, because her husband had received a Fulbright travel grant to join Prof. K. O. Emery at the University of Southern California in Los Angeles on a marine geological project. On the recommendation of Ken Emery, Kuni received a contract from Prof. J. L. Mohr of the Biology Department, to work on plankton and benthos collections from various expeditions to the Arctic Ocean. Her studies were directed especially to Radiolaria, of which she described three species new to science, Pelecypoda, and Bryozoa.

After three years in Los Angeles, Kuni and Jobst moved to the east coast of the U.S. where Jobst had a new job at the Woods Hole Oceanographic Institution (WHOI). Kuni, who wanted to continue her scientific work, received an offer from George Grice of WHOI to work with him in the field

of copepod taxonomy. She accepted, although she admittedly knew “next to nothing about copepods”. However, because of her previous experience with other taxonomic groups, and with the help of George Grice, she soon became well acquainted with this group of small crustaceans, and over the following six years they pursued a fruitful cooperation on the taxonomy of calanoid copepods in the Atlantic and Indian oceans, which resulted in the description of numerous new species in several outstanding publications. For example, in their fundamental article on the bathypelagic copepods of the Indian Ocean (1967: Proc. U.S. natn. Mus. 122 (3583):1-67) they identified a total of 350 copepod species (!), among which one new genus, 17 new species, 8 previously unknown males, and one previously unknown female were described.

This successful cooperation ended when Jobst was asked to set up and head a West Coast laboratory for the United States Navy at San Diego, California, and she accompanied him. Both liked the area around San Diego very much, they bought a house, and Kuni was busy buying furniture and getting settled. When she eventually made an appointment with Dr. Abraham Fleminger at the Scripps Institution of Oceanography to inquire about putting her experience and expertise to good use, she was surprised to learn that he was awaiting her phone call. Only then did she learn that Grice had already informed Fleminger about her transfer (“Kuni is going to San Diego, watch out for her”). For nearly the next ten years (until 1977) she worked with Abe Fleminger on calanoid copepods. The direction of her studies now shifted from descriptive taxonomy towards biogeography and the morphology of speciation. Copepods are a very old group, that, however, do not fossilize well. Fleminger’s ideas of investigating the relative age of species by studying their zoogeographical distribution and morphological divergence in relation to ocean currents and movements of continents were new and very stimulating for her. The epipelagic warm-water group of pontellid copepods were taken as representative, because they were of decent size and showed strong interspecific differences. Another extensive study that they began was a worldwide study on *Calanus*, of which the *helgolandicus* group in the North Atlantic could be completed, providing evidence of recent speciation of the Black Sea population. These studies were quite complicated and time-consuming, because the morphological differences were very small and suites of characters had to be used to differentiate between populations. Even modern genetic approaches, nowadays used by taxonomists as alternative methods, still are not able to fully answer the open questions in this research field because of the small genetic distances between populations.

In 1976, Kuni’s husband moved again, this time back to northern Germany, where he found a new job. Kuni followed him one year later, when she was offered the position of head of the Taxonomical Working Group (TAG) at the Biologische Anstalt Helgoland in Hamburg. This was the last and longest station in her scientific life. From 1977

until her retirement in 1992, she worked on the copepod material from expeditions of German research vessels and participated in several expeditions (e.g., RV “Meteor”), collecting plankton material herself. She headed the TAG for almost 10 years and looked after the concerns of her colleagues with great interest and energy. Her main research interests were now directed to tracing homologies of appendages during ontogenetic development of calanoid copepods. She also recognized the taxonomic value of cuticular pores for the identification of copepod species, an opinion regrettably not shared by some other German taxonomists. By keeping in contact with Abe Fleminger she was able to complete several studies that she had begun during her time at Scripps. In 1989, after Fleminger’s death, she worked at Scripps as a guest scientist, examining his scientific estate. She also held taxonomic training courses for students and teachers in Germany, Norway and Brazil, and she was one of the few copepodologists who participated in the very first International Conferences on Copepods (ICOC Amsterdam 1981 and Ottawa 1984) prior to the foundation of the World Association of Copepodologists (London 1987). Some WAC members may remember her from the memorable and stimulating conference in Karuizawa, Japan (1990), which was the last ICOC she participated in, where she strolled around the conference site flanked by Ju-shey Ho and the late Arthur Humes – all three in their socks.

During her research career, Kuni Hulsemann in co-authorship with her colleagues published 38 papers and described 67 species of copepods new to science, which included 6 new genera; she also re-named one genus and 5 species of copepods. Most of them were calanoids, but – incidentally – a siphonostomatoid and a misophrioid copepod were included. When I once asked her, which one was her favourite species, she hesitated and then decided that it might be *Foxtonia barbatula* (the first species that she described together with George Grice) and perhaps the siphonostomatoid *Megapontius* (“because it was so different”). Three copepod species and one genus have been named after Kuni Hulsemann, indicating the great esteem of her colleagues for her work: *Euaugaptilus hulsemannae* Matthews, 1972; *Hyalopontius hulsemannae* Boxshall, 1979; *Lucicutia hulsemannae* Ferrari & Markhaseva, 2005; and *Kunihulsea arabica* Schulz, 1992. Kuni had a refined but unassuming manner. She did not seek approval from others for her worth as a scientist. Her life was dedicated to science, and she was always motivated by a general interest in the field and the subject she was studying, even during periods of tiresome work, which is naturally involved – especially in taxonomy – or when experiencing administrative difficulties.

After her retirement in October 1992, she enjoyed various other activities, such as reading early history books, visiting friends and relatives, and taking long walks outdoors. Together with her husband she spent the winter in San Diego and returned to their home near Hamburg only during

summer. Some time after his death in 2002, she moved to the city of Halle on the river Saale in eastern Germany, where her sister’s family lived. Even then she continued her life as a bird of passage between California and Germany. When she returned from San Diego in May 2006, she was struck by the serious diagnosis of cancer and had to undergo surgery and chemotherapy. Her sister and her niece took care of her and accompanied her during the last painful months of her life. According to Kuni’s last wish, her ashes were scattered over the North Sea.

Kuni Hulsemann’s attitude to science can best be explained by citing what she said on the occasion of her retirement: “I like to view my studies within the whole field of biology ... we should not lose sight that these [aspects] are part of the whole nature. Therefore, I consider myself as a biologist; taxonomy is just a special aspect.”

— Ruth Böttger-Schnack
Rastorf-Rosenfeld, Germany

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Teruo Ishida
1927 - 2007

Dr. Teruo Ishida passed away at the age of 80 from lung cancer on March 30, 2007. He was known as a prominent scientist who studied the freshwater copepods in Japan. Dr. Ishida was born on January 1, 1927 in Chiyoda Village, Chiba Prefecture. In 1943, he entered the Faculty of Agriculture of Hokkaido University in Sapporo. In 1947, as a student of Professor Shigeru Motoda, he first studied the ecology of zooplankton in Lake Abashiri, a brackish-water lake on the Okhotsk Sea coast of Hokkaido. Through this study, Teruo acquired a strong interest in zooplankton, particularly copepods.

After graduation from Hokkaido University, he began work as a governmental scientist at the Hokkaido Fish Hatchery (HFH), later moved to the Hokkaido Regional Fisheries Research Laboratory (HRFRL), then to the National Research Laboratory for Far Fisheries (NRLFF), and finally to the Hokkaido Salmon Hatchery (HSH). At the HRFRL and NRLFS, he was involved in research on fisheries management for commercially important pelagic fishes, especially Pacific salmon (*Oncorhynchus* spp.) and Pacific herring (*Clupea pallasii*). One of his distinguished works done at the HRFRL was about the ecology of Pacific salmon with notes on their population structure, and based on this study he was awarded his doctoral degree at Hokkaido University. His study was quite important for understanding of salmonid populations caught by Japanese fishermen on the high seas of the North Pacific Ocean, and contributed to discussion at meetings of the International North Pacific Fisheries Commission (INPFC), an international organization for fisheries management for important fishes in the North Pacific Ocean. At the HFH and HSH, he also conducted various studies in Hokkaido, including, for example, the ecology of planktonic copepods

in inland lakes and the ecology of juvenile masu salmon (*Oncorhynchus masou*) in rivers.

Around the end of the 1970s, Teruo decided to devote his remaining life to research on freshwater copepods in Japan, which he had long wanted to study since his graduation in Hokkaido University. His first paper on this subject was published in 1981 in the “Scientific Reports of the Hokkaido Salmon Hatchery” under the title of “A preliminary account of the freshwater harpacticoid copepods of Hokkaido, northern Japan.” In 1987, the year of his retirement, Teruo compiled his paper entitled “Freshwater harpacticoid copepods of Hokkaido, northern Japan” containing identifications and/or descriptions of 11 genera and 29 species. Even after this publication, his enthusiasm for freshwater copepods never waned but increased markedly, which resulted in 73 scientific papers on copepods in peer-reviewed journals.

He studied the copepods using a small space equipped with microscopes at his house in Yoichi, Hokkaido. When he traveled in Japan and other countries, he always sampled the copepods. With constructive comments from Janet W. Reid (Smithsonian Institution, currently Virginia Museum of Natural History) and Mark J. Grygier (Lake Biwa Museum) on Teruo’s drafts, he successfully published several papers of quality in English during the 1990s and early 2000s. His continuous work produced two large papers entitled “Illustrated fauna of the freshwater harpacticoid copepods of Japan” (containing 18 genera and 57 species) (with Yoshiaki Kikuchi, Ibaraki University) and “Illustrated fauna of the freshwater cyclopoid copepods of Japan” (containing 18 genera and 60 species) in 2000 and 2002, respectively. Both papers, found in the “Bulletin of the Biogeographical Society of Japan,” have many illustrations with key morphological characters, and were written in Japanese for easy identification by students and scientists in Japan. In 2005, he also wrote an essay about the fauna of freshwater copepods in Japan based on his experience, as a chapter in the book “Introduction to copepodology – world of tiny giants in water” published by the Tokai University Press. It contains his message, which is useful to students majoring in freshwater biology.

Dr. Teruo Ishida really enjoyed his second life after retirement by studying the freshwater copepods, and greatly contributed to the progress of copepodology. He is survived by his wife, Ichi, together with many colleagues in this branch of science worldwide.

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A Personal Remembrance

Nineteen years of correspondence with Teruo Ishida began in 1988 when he wrote to introduce himself and inform me that in his retirement he was initiating studies of the freshwater copepods of Japan. His very first letter discussed some biogeographical relationships between the Japanese and North American faunas, especially of harpacticoids, a theme that guided and informed his studies over the next two decades. Teruo's interest in copepods seemed to be based as much on their aesthetic as on their scientific value. He once characterized Japan as a "jewel box" full of harpacticoid species.

His letters described his collecting expeditions throughout Japan, from the steep northern mountains of Hokkaido to the hills and mangrove swamps of subtropical Iriomote-shima. He also collected during visits to London in 1987 (after the 3rd ICOC), south-central Alaska in 1992, the eastern U.S.A. (in 1993 after the 5th ICOC), Germany (in 1996 after the 6th ICOC), and elsewhere. Many of these forays resulted in discoveries of new taxa, and all of them provided new and often surprising information about species distributions. The arc of Teruo-san's second career as a copepodologist, which he characterized as "suitable for a retired Japanese gentleman," began with these local but thorough surveys, flattened for awhile as he dealt with conundrums of morphological variations in harpacticoids and cyclopoids, and reached its apogee in two important synthetic works, the first with Yoshiaki Kikuchi on the freshwater harpacticoids of Japan, published in 2000, and the second in 2002 on the freshwater cyclopoids. In the five years following the appearance of the latter monograph, he published 11 papers that reported still more new taxa and new records. As he himself estimated, these works probably cover 90% of the species present in surface-water habitats in the islands. Always modest, in publications he tended to understate the biogeographical importance of his finds, although his letters revealed that he continued to speculate on their significance, in particular on relationships with the North American fauna. The body of his work now constitutes an invaluable basis for such productive comparisons.

Our native *Magnolia grandiflora* trees are fattening their buds in the fine calm days of early summer. The passing of spring is very obvious with these trees because they drop last year's leaves just before the buds open. It occurs to me that taxonomists are much like the magnolia flowers. They are individually prominent, because there are so few on the tree at any one time. They are elegantly symmetrical in bud, striking in full bloom, and subtly complex in their older stages. And then when the petals fall, a cone full of red seeds develops to brighten the colder months; although only very seldom will one of the seeds germinate into a young tree. In every letter, Teruo Ishida shared his observations of the natural world, especially his flower and vegetable garden and the local crows that he fed, enjoying their different

personalities. Perhaps he would have liked this modest simile, offered in deep appreciation of a valued colleague.

— Jan Reid
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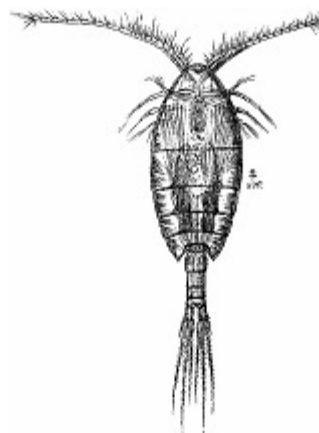
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* The English title is given here for the first time.

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**Account of the
Crustacea of
Norway, Vol. IV:
Copepoda
(Calanoida)
By G. O. Sars**

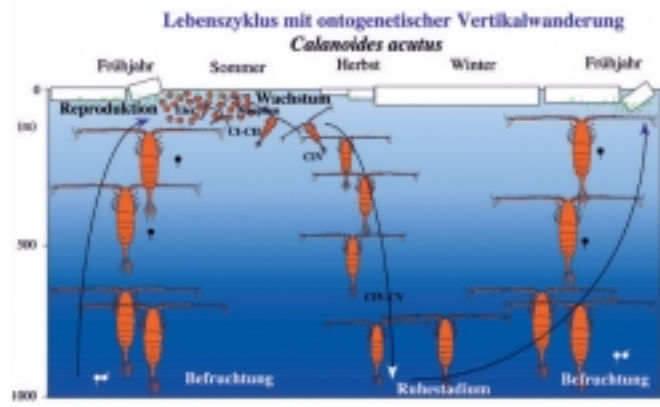
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Life cycle, showing the seasonal and ontogenetic vertical migration of the Antarctic copepod *Calanoides acutus*. Figure 4 in *Faszination Meeresforschung*.

**Faszination Meeresforschung:
Ein biologisches Lesebuch**
**Edited by Gotthilf Hempel, Irmtraut Hempel,
and Sigrid Schiel**
**2006. Verlag H. M. Hauschild GmbH, Bremen,
Germany. ISBN: 3 89757 310 5. 464 pages, 332 color
illustrations, 51 plates. € 39.50**

“Fascination of Exploration of the Sea: A Biological Reader” gathers contributions by 80 authors, all specialists in their fields, who have written about their favorite subjects for laymen. Experts from the Kiel, Hamburg, and Bremen marine institutes are particularly well represented. Topics range from physical oceanography to the functioning of marine food webs, and from bacterioplankton to huge whales. There is a section on “Humans and the Sea” and several chapters on the Baltic. The high quality of the illustrations is apparent from the schematic life cycle of *Calanus* shown above. This book is a valuable resource for journalists and laymen to acquaint themselves with the current state of research on a wide array of issues and problems.

Simple Methods for Aquaculture

We are pleased to inform you that the second version of the CD-ROM - *Simple methods for aquaculture*, has been published. Kindly note that these publications have been highly requested. It is now available both in CD-ROM and online:

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The new version has been revised, improved and includes all the manuals in French, English and Spanish (Version 1 did not have Spanish).

Copies will be supplied free of charge to developing country libraries if you supply a mailing address.

Aquaculture Management and Conservation Service
 FAO Fisheries Department
<http://www.fao.org/fi/default.asp>

**World Directory of Crustacea Copepoda
of Inland Waters II. Cyclopiformes**
By Bernard H. Dussart and Danielle Defaye
2006. Backhuys Publishers, Leiden, The Netherlands.
Paperbound. ISBN: 90-5782-175-3. 354 pages. € 84

This second and greatly enlarged version of Bernard Dussart and Danielle Defaye's 1985 world list of continental cyclopoids lists 1008 recognized species now known from fresh and brackish waters. Members of the families Oithonidae (subfamilies Oithoninae and Limnoithoninae), Cyclopinidae, Cyclopittidae, and Cyclopidae (subfamilies Euryteinae, Halicyclopininae, Eucyclopinae, and Cyclopinae) are included. For each genus, the major synonymy is given, with in some cases extensive discussion of the taxonomic history; and world or regional keys are listed. For each species and subspecies, the current combination of genus and species names, major synonymy and references, other references on taxonomy and geographical records, and the general distribution by country, region, and, when appropriate, the major waterbody are provided. There are useful notes on taxonomic questions or special habitats for some species. An extensive bibliography includes most works on taxonomy and distribution of cyclopoids beginning with Müller (1776).

How does one review a list? In general, a user will expect that such a list will be complete, consistent, clearly organized, comprehensively cross-referenced, and as contemporary as possible.

The authors worked intensively to make this list as complete as possible. Genera and species recorded through 2005 are included, ending with new taxa from Australia proposed by Karanovic (2005) and from India by Karanovic and Ranga Reddy (2005). As far as I could determine, the assignment of species to genus faithfully reflects the latest information available; Dussart and Defaye have taken a conservative approach in their assignments, carefully noting instances where specialists may not yet have arrived at a consensus. However, some important works have been, rather inexplicably, incompletely referenced or even omitted. For instance, there is no reference to the first version of their list. In the Introduction, the authors observe

that the work of Schmeil (in Giesbrecht & Schmeil, 1898) is considered one of the bases of modern freshwater copepodology, but then reference this fundamental work only in summary form in the text, not in the Bibliography. Unmentioned is the extensive online key to the copepods of the Laurentian Great Lakes by Hudson et al. (2003), although the earlier, much less complete regional key by Hudson et al. (1998) is included; or the illustrated key to plankton of the northeastern U.S.A. by Aliberti et al. (2003). A number of less extensive faunistic studies that give important distributional data, e.g., by Robert E. Coker and students in North Carolina and Virginia, U.S.A.; Sharon Czaika on lakes Ontario and Erie; Vezio Cottarelli and colleagues in Italy; Odete Rocha and colleagues in Brazil; and Raúl A. Ringuelet in Argentina, surprisingly do not appear in the References; although many ecological and anatomical studies that do not supply new geographical records or taxonomic insights are included. Therefore, although it is extensive, the list of references should be used as a wide portal to the vast literature on cyclopoid taxonomy and distribution.

Certain omissions make this work less useful for beginning students than it could be. The distributions omit mention of areas where species are considered to have been introduced. The habitat notes are rather inconsistent; they could be more complete, and also provided for every species. In view of the extent and variety of publication venues, it would have been helpful to provide the titles of journals in full.

The format is followed consistently throughout. The clear organization, which made the earlier version so easy to use, is repeated. The Index to species and genera seems to be complete and accurate – an amazing feat in itself.

This book is as up-to-date as could be expected. Twelve references that appeared in 2006, including the massive work by Maria Holyńska on the phylogeny of *Mesocyclops*, are included and integrated into the main text.

In a work of this scope and density, one can always find typographical errors, lapses in English, and similar, very minor problems. Although these are refreshingly few, at least the English could have been edited by a native speaker. The name of the Japanese limnologist Takashi Ito is erroneously written with a circumflex “ô” although this style was used not by him but by the eminent harpacticoid specialist Tatsunori Itô. Still a third “T. Ito,” the aquatic entomologist Tomiko Ito, also does not use the circumflex (e.g., Tomikawa et al., 2005). The Vietnamese entomologist Vu Sinh Nam should be indexed under his family name “Vu” (not “Nam”), and the Brazilian copepodologist Edinaldo Nelson dos Santos-Silva should be indexed under the first of his double surnames.

Physically, the book is very well made, compact in size (15.5 x 24 cm), with good-quality paper and a clear typeface. Although softcover, it should stand up to much thumbing.

Less professional credit is perhaps awarded to authors of compendia such as these, than to authors of monographs of

similar length. However, it seems to me that the work involved is similar, in that every line represents the fruits of the authors' profound plumbing of the literature, and their experienced taxonomic judgment. In this, seemingly simple “list,” Bernard Dussart and Danielle Defaye have distilled their lifetime studies on the taxonomy and distribution of the continental cyclopoids.

This work is an essential addition to the bookshelf of every student of continental copepods. It is impossible adequately to express how useful Bernard's and Danielle's compendia have been for my own studies, and how grateful I have been over the years, that they have made the decades-long effort to provide these references for us. Present and future colleagues and students will cherish these books.

— Jan Reid

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Atlas do Zooplâncton da Região Central da Zona Econômica Exclusiva Brasileira

Edited by Sérgio Luiz Costa Bonecker
2006. Museu Nacional, Rio de Janeiro/ Documentos
REVIZEE Score Central, Série Livros 21. 234 pp.,
illustrated. ISBN 85 7427 016-4.

The Brazilian REVIZEE Program "Assessment of the Sustainable Living Resources – Potential of the Exclusive Economic Zone," since its initiation in 1995 has supported a number of projects to characterize the pelagic and benthic marine environment off the coast of Brazil. Among the many products of this extensive program is this new Atlas for several zooplankton groups collected off the central part of the coast, across ten degrees of latitude, from off Bahia in the north to Cape São Tomé of Rio de Janeiro in the south. This volume covers the Copepoda (70 species), decapod larvae (30 taxa), Chaetognatha (17 species), Appendicularia (15 species), Salpida (8 species), and Doliolida (4 species). Each species (or larva) is illustrated, with a brief taxonomic diagnosis, notes on its ecology and distribution, the material studied, basic literature references, and a map of the stations where it was collected. The atlas was produced by the Integrated Ichthyoplankton and Zooplankton Laboratory of the Federal University of Rio de Janeiro.

The chapter on the Copepoda, authored by Cristina de O. Dias and Adriana V. de Araujo, provides schematic drawings of the habitus and useful field marks for most species. The four species of monstrilloids are illustrated in more detail, with reproductions of the original figures.

— Jan Reid

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Editor's Notes

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— Jan Reid, Editor

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