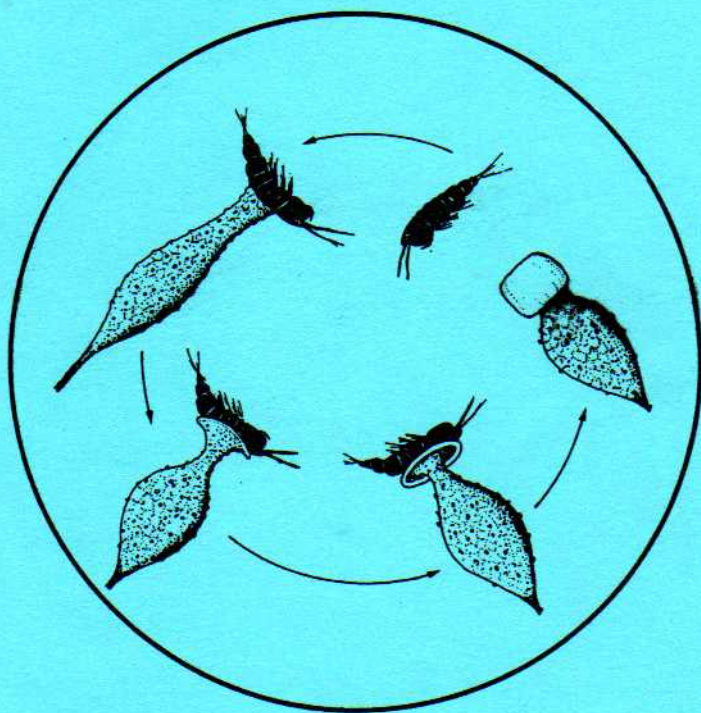


MONOCULUS

Copepod Newsletter



Nr. 35

APRIL 1998



Bibliotheks- und Informationssystem der Universität Oldenburg
North American Edition distributed by National Museums of Canada

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Copepod Newsletter

Number 35

April 1998

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Produced by: Bibliotheks- und Informationssystem (BIS) der Universität Oldenburg, Ammerländer Heerstr. 67/99, D-26111 Oldenburg, Germany.

Distributed in Canada by: E.J. Maly, Concordia University, Biology Dept. 1455 de Maisonneuve Blvd. W, Quebec H3G 1M8 Montreal, Canada.

Distributed in Europe and overseas by: H.-U. Dahms, Universität Oldenburg, Fachbereich Biologie, D-26111 Oldenburg, Germany.

Distributed in India by: M. Madhupratap, National Institute of Oceanography, Dona Paula, Goa 40 3004, India.

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Distributed in the U.S. by: Frank D. Ferrari, National Museum of Natural History, Smithsonian Institution, Department of Invertebrate Zoology, MRC 534, Washington D.C. 20560, U.S.A.

The following colleagues are acknowledged for substantial help in providing literature sources: Sophie Conroy-Dalton (London), Danielle Defaye (Paris), Ju-shey Ho (U.S.A.), Adrianna Ianora (Italy), Anna F. Pasternak (Russia), Shin-ichi Uye (Japan), Chad Walter (U.S.A.).

This issue has been typed by: Angelika Sievers, Brigitte Hülsmann and Hertha Sauerbrey, cover as well as cartoons by Mark Pottek (Fachbereich 7, Universität Oldenburg).

Cover: The sequence of feeding a copepod in *Protohydra leuckarti* - the formation of „hammer head“ (after K. Muus 1966, *Ophelia* 3: 141-150) - *If things always were that easy!?* (editorial remark)

Birthdays in 1998:	70	Sigeo Gamô
		Hans Jakobi
		Gotram Uhlig
		Desmond Eugene Hurley
	75	Bruno Battaglia
		Gayle A. Heron
		Yoshifumi Miura
		M.P. Rangnekar

Deadline for the next issue of MONOCULUS: 30th September 1998

EDITORIAL

The sensory world of copepods is still a realm of little scientific insight. The comparatively „simple“ architecture of copepod nervous systems and those structures we assume to have sensory functions suggest on poor sensory capabilities. Looking at copepod behaviour, however, we can learn about rather complex and differentiated responses to hydrodynamic changes, changes of light intensity and quality, temperature, or chemicals in quite „homeopathic“ concentrations (e.g. the pheromones of potential mates or the kairomones of predators). Probably, there is an internal clock responsible for cyclic changes (as vertical migration, diapause, or reproductive activity). And there is no reason why copepods should not perceive electric and/or electromagnetic fields, extreme frequencies of hydrodynamic oscillations, or other qualities remote to our sensory perception of the world.

The most fascinating questions will certainly be those facing the evolutionary causes and pathways of evolutionary transformations of sensory capabilities.

We are very grateful to Angelika Sievers who gave her best, starting to organize this issue of MONOCULUS before a longer period of health recreation. We thank particularly Brigitte Hülsmann and Hertha Sauerbrey for finishing up and preparing the final layout. Mark Pottek is celebrating his 10th anniversary in providing our newsletter with neverending new variations of copepod cartoons - congratulations and thanks to Mark!

For the fact that about 350 colleagues are receiving the MONOCULUS newsletter, much more active participation would be desirable. Please, don't hesitate to send us all information that you consider interesting with your recent papers on copepod biology. Since longer, MONOCULUS is gathering reprints in the MONOCULUS library. You will find those here under „LITERATURE“ marked by an asterisk. Therefore, please put and keep MONOCULUS (and the Wilson library - for details see the back cover of this issue) on your mailing list.

For the reason of rising mailing costs an updated survey copepodologists will at first be available from our MONOCULUS homepage the next weeks. Colleagues without wwwweb access are kindly requested to ask for a reprint!

Mailing

Looking at your address label you will find some additional information. This is to remind you of your status in relation to WAC and when to pay the next dues:

89-98 = WAC member, dues paid including printed year

W = Membership dues waived

NM = New member, no dues paid

NM98 = New member, dues paid including 98

CM = Candidate member, no dues paid

CM98 = Candidate member, dues paid including 98

ANNOUNCEMENTS**SPECIAL INTERNATIONAL CONFERENCE
NEW METHODS IN COPEPOD TAXONOMY**

4-8 May 1998, St. Petersburg, RUSSIA

Preliminary program (changes are possible)

Monday May 4

REGISTRATION**WELCOME RECEPTION**

Tuesday May 5 morning

REGISTRATION**Opening SESSION**

Chair Victor Alekseev

Welcome Address from Hydrobiological Society of Russian Academy of Sciences

Aleksandr Alimov, President, Director of Zoological Institute of Russian Academy of Sciences.

Welcome Address from World Association of Copepodologists

Hans-U. Dahms

Keynote Address The impact of Dr. Ulrich Einsle in application of new methods in Copepod Taxonomy

Grace Wyngaard

SESSION: Larval signs used in taxonomy

Chair Frank Ferrari

Using larval characters in the classification of parasitic copepods

Geoffrey Boxshall

Phylogenetic implications of early postembryonic development in the Copepoda

Hans u.-Dahms

Peculiarities of naupliar morphology as they related to taxonomy of the *C. scutifer* group

Emma Streletskaia

Behavioral peculiarities in Cyclopidae nauplii: How can we use them in taxonomy?

Victor Alekseev

Conserved patterns of thoracopod development among Copepods

Frank Ferrari

afternoon

SESSION: Chromatin diminution and hybridization

Chair Grace Wyngaard

The Problem on cytotaxonomy of the species *C. strenuus* and *C. kolensis*

Andrej Grishanin

The interbreeding evidences of the cryptic species presence in the genus *Diacyclops* (Copepoda)

Vladislav Monchenko

Genome size in freshwater cyclopoid copepods

Grace Wyngaard and Ellen M. Rasch

THEATRE

Wednesday May 6 morning

SESSION: New taxonomic characters

Chair Vladislav Monchenko

Is the spinule pattern on the leg 4 copepodid a tactile signal in the specific mate recognition system of *Mesocyclops* species?

Maria Holynska

On taxonomic status of Cyclopidae species from Central Siberia

Ulrich Einsle, Victor Alekseev & Galina Mazepova

Remarks on the systematics of the genus *Xantharus* Andronov

Knud Schulz

Comparative analysis of the family Asterocheridae (Siphonostomatoida)

Viatcheslav Ivanenko

Discussion of the taxonomic status of *Boeckella orientalis* Sars, 1903

Guo Xiaming & Hans Löffler

Towards taxonomy of the *Microcyclops varicans*-complex

Iskandar Mirabdullaev

afternoon

GUIDED VISIT TO HERMITAGE MUSEUM

Thursday May 7 morning

WORKSHOP on hybridization in Fisher's species.

Conveners: Victor Alekseev & Vladislav Monchenko (Poster session on Copepoda)

E. Abramova; V. Alekseev; E. Barabanthshikow; E. Cruppa, E. Feofilova; A. Khozjakin; E. Kurashov; V. Monchenko; I. Mirabdullaev, B. Pinel-Alloul, A. Stepanova; A. Synev)

afternoon

WORKSHOP on chromatin diminution in Copepoda.

Conveners: Grace Wyngaard & Andrej Grishanin

BOAT TRIP & FESTIVAL DINNER

Friday May 8 morning

SESSION: Molecular-genetic methods

Chair Sergey Inge-Vechtomov

Systematic and neutral evolution in Arthropoda

Leonid Kajdanov

Molecular phylogenetic studies and their taxonomic applications

Evgene Sokolov

Developing molecular-biological methods for population analysis in Lake Baikal endemic

Epischura baicalensis Sars (Copepoda, Calanoida)

Natalia Melnik

Problems of application of molecular-biological methods for small sized Copepods

Peter Weekers, Victor Alekseev & Henri Dumont

SESSION: Variability of taxonomic characters Chair Yaroslav Starobogatov

Components of morphological variation in geographically distant populations of a baikalian endemic cyclopoid *Acanthocyclops signifer* (Mazepova)

Dmitrij Lajus & Victor Alekseev

Morphological variability among populations of *Eurytemora velox*

Lilljeborg, 1853, first recorded for Austria and newly found in Hungary

Santiago Gaviria & Lazlo Forro

Intra- and interpopulation diversity of *Acanthocyclops robustus* Sars (Crustacea: Copepoda) from South Eastern Kazakhstan

Elena Kruppa

afternoon

SESSION: Other non traditional methods and new taxon description

Chair: Andreij Monakov

Redescription of *Bradophyla pigmea* Levineen 1878, a parasite copepod on *Brada vilosa* from the White Sea: new signs and taxonomic perspectives

Andrey Marchenkov

Spongopsyllus adventicius a new species and genus of Entomolepididae (Copepoda: Siphonostomatoida) associated with sponges in Brazil

Rodrigo Johnson

New camera for holding and scatching copepods and other small zoological objects

Mikhail Heptner

Morphological anomalies in *Mugilicola smithae*

Annemarie Avenant-Oldewage

Using of computer analysis for taxonomic study of Diaptomidae

Ludmila Stepanova

SESSION: New theories on Copepod taxonomy and systematics

CHAIR Geoffrey Boxshall

New view on relations of Copepoda with other Maxillopoda

Yaroslav Starobogatov

Taxonomic diversity in Crustacea related to holohalinity phenomenon

Vladislav Khlebowitch

Trends in Copepoda and Cladocera taxonomy

Nikolay Korovchinsky

FINAL DISCUSSION & CLOSING OF THE CONFERENCE

Saturday May 9

POST CONFERENCE TRIPS AND DEPARTURE

Forthcoming International Workshop on Sealice Biology

Recent advances in the study of the biology of sealice will be the subject of a three-day workshop to be held in Amsterdam from 22nd to 24th July 1998.

Following the successful formula of the first sealice meeting held in Paris in 1992, the AMSTERDAM workshop will take place during the Fourth World and Third European Crustacea Congresses, hosted by the University of Amsterdam. The dates of the main congress are 20th to 24th July 1998. This will enable sealice researchers to see their work within the wider context and to interact with top crustacean specialists worldwide.

The Crustacean Congress has plenary sessions each morning so the outline programme for the sealice workshop will be as follows:

SEALICE WORKSHOP SESSIONS

Wednesday, 22nd July pm:	Sealice and Fish Parasitic Crustacea Contributed papers
Thursday, 23rd July pm:	Sealice Biology Contributed papers

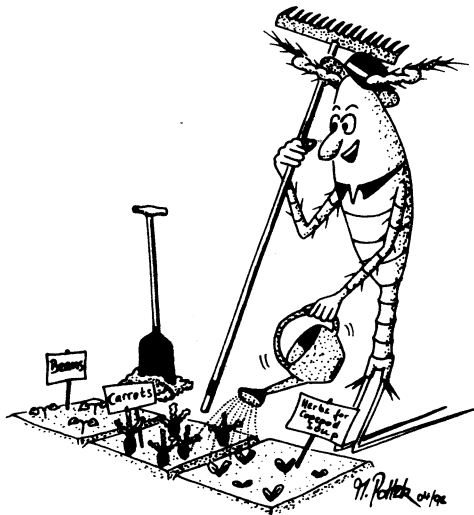
Friday, 24th July am: **PLENARY SESSION**
Sealice Workshop speaker: Gordon Rae
Scottish Salmon Growers Association

Friday, 24th July pm: Sealice Biology
Contributed papers

There will also be sealice poster sessions during 22nd to 24th July.

Registration: To register contact:

Conference Office
Universiteit van Amsterdam
Spui 21
1012 WX Amsterdam, The Netherlands
FAX: +31-20-525-4799



SECOND CIRCULAR
VII INTERNATIONAL CONFERENCE ON COPEPODA
25 – 31 July 1999
Curitiba, Brazil

A letter of welcome

In Curitiba 1999, a first circle will close. When I first came to Brazil in 1977, about twenty years ago, I was surprised to meet in that country so many active copepodologists, unbeknownst to me. They were and are the brood of Tagea Björnberg, first among them the much regretted Frederico Campaner. The idea of a world organization of copepodologists can be traced back to that visit. By coming now, at the end of the millennium and at the eve of the third century of copepod research, to Brazil and to the Southern Hemisphere, our organization came of age as a real World Association.

Brazil has much to offer. Zoology started here with O.F. Müller, Darwin's friend and correspondent. The Neotropical fauna, not impressive in the sizes of the animals, is overwhelming in its colorful diversity. If we accept the minimum rule "one fish species - one specific copepod species", than the richest freshwater fauna of the world, that of Brazil, harbors the richest fauna of parasitic copepods. Copepods are found in Brazil in the most unusual environments: bromeliad tanks, *Heliconia* axillae and in the soil of wet savanna. The subterranean fauna, classically studied by Noodt and his school, still yields many interesting taxa. Finally, the Antarctic fauna, actively studied by Brazilian and other Southamerican copepodologists is of special interest.

But indeed, Brazil is interesting not only if seen through the single monocular eye. Within easy reach from Curitiba, one can visit majestic Araucaria forests, the Pantanal – world's largest wetlands –, the famous and easily accessible Atlantic Rainforest, the world champion Iguazu waterfalls, and some of the most beautiful sea shores of the world. For those who are ready to extend their stay, there is of course Amazonia (copepods are to be found everywhere ...)! After the Oldenburg experience, one has to think also of the Brazilian music, of which Villa Lobos and Samba are only the tip of the iceberg. And of food: divine gaúcho barbecue and the most unexpected tropical fruits are only the abstract of a menu. Finally, to top all this, we have the Brazilians, beautiful human specimens, a harmonious blend of our three races, who provide an easy-going and hospitable human environment. So: Bem-vindos ao Brasil! (Welcome to Brazil!)

Dov Por, São Paulo,
(on behalf of the Local Organizing Committee)

Conference venue

All sessions and meetings will be held at the Conference Centre of the Universidade Federal do Paraná ("Teatro da Reitoria"), in downtown Curitiba, a walk of just 2-15 minutes from a number of hotels selected by the Organizing Committee. The centre, with a capacity for 500 people, will be provided with all conference facilities for oral sessions and poster displays. Other facilities (such as e-mail and WWW access, fax, photocopies) will be available at the reception room.

Registration and express of interest

If you are planning to attend the conference, please fill in the preliminary questionnaire attached to this issue. Definitive registration forms will be available in MONOCULUS 36 (October 1998). However, the forms will be posted beforehand on the conference web site, by August 1998.

Programme

Sunday, 25

15:00–19:00 Registration

18:00–21:30 Informal cocktail with live music

Monday, 26

9:00–9:20 Opening session of the conference

9:20–13:00 Symposium I

Copepod development: its evolutionary and ecological implications

Convener: Hans-U. Dahms (University of Oldenburg, Germany)

13:00–14:30 Lunch

14:30–18:30 Poster and oral presentations

19:00–19:30 Copepod spotlights: video presentation about places of touristic interest in Brazil.

Tuesday, 27

9:00–12:30 Symposium II

Copepods in Antarctic and Subantarctic ecosystems

Convener: Victor Marin (University of Chile, Chile)

12:30–14:00 Lunch

14:00–18:00 Poster and oral presentations

20:00– Visit to a local pub.

Wednesday, 28

Mid-conference excursion (see details below)

14:30–18:00 Symposium III

Copepods in challenging environments

Conveners: Janet W. Reid (Smithsonian Institution, U.S.A.) and

Carlos E.F. Rocha (University of São Paulo, Brazil)

Thursday, 29

9:00–12:30 Symposium IV

Sexual dimorphism in copepods

Convener: Geoffrey Boxshall (The Natural History Museum, U.K.)

12:30–14:00 Lunch

14:00–16:00 Poster and oral presentations

16:30–17:30 Maxilliped Lecture

17:30–18:30 WAC Plenary Session

21:00– 22:30 Musical evening: A major Brazilian musician will play for conference participants, in a very special concert.

Friday, 30

9:00–12:30 Symposium V

Biogeography of copepods: a cross-section of the major taxa

Convener: Dov Por (Hebrew Univ., Israel & Univ. of São Paulo, Brazil)

12:30–14:00 Lunch

14:00–16:00 Poster and oral presentations

16:30–18:00 Forum "Copepoda 2000"

20:30– Conference dinner

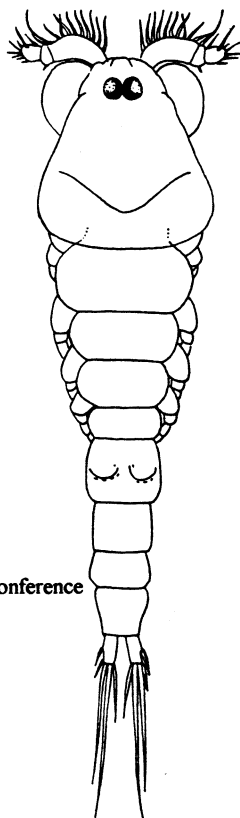
The conveners of the special symposia are currently selecting and inviting potential lecturers. The complete list of presentations during each symposium will be available on the next *Monoculus*.

"COPEPODA 2000":

A Forum on The Future and the Challenges of Copepod Research

The proposed forum will be launched before the conference, via an Internet newsgroup on Copepoda (an e-mail newsgroup), for interactive discussion of the strategic and key issues for the future development of the wide range of copepod research in the world. All aspects will be welcome, from the most pedestrian technical to the most far-flung theoretical ones! Every interested copepodologist will be able to join the newsgroup, to express his/her opinion on a particular subject and to introduce new questions and topics for discussion.

The newsgroup will open next June or July, and will be active until the conference. A summary of discussions and conclusions will be displayed on the conference web page (with monthly updates) and on the biennial issues of *MONOCULUS*. In that way, everyone interested to follow the discussions, but having no time or interest to subscribe to the newsgroup, will be able to check what's going on. Besides, contributions through regular mail



will also be encouraged, particularly from those who subscribe to MONOCULUS, but have no Internet access.

The moderator of the Internet newsgroup will be in charge of the forum session during the conference (Friday afternoon), presenting the relevant suggestions received and inviting the participants to expand the topics and depth of the discussion. Those investigators will come from the audience for a brief explanation of their ideas, followed by further comments and discussions by the audience. Please check the conference web page for more information on the Forum (see Internet address below).

Programmed tours

Mid-conference excursion

The Local Organizing Committee will arrange a whole-day visit to the coastal mountain range (the "Serra do Mar") and the coastal lowland, by a tourist train. The railroad crosses the well-preserved Atlantic rainforest, providing wonderful views through its breath-taking steepes, and reaches the colonial towns of Morretes and Paranaguá. Symposium III will be held after lunch time (see above), in one of the available auditoriums of the region. We will return to Curitiba after the symposium.

Short post-conference tours

Depending on the number of interested participants, two post-conference tours will be organized on Saturday, 31 July: 1) Paraná shoreline and Mel Island; and 2) Vila Velha State Park. Additional information in the next MONOCULUS issue!

Long-distance tours

Guided excursions to the Iguazu Falls, the Pantanal – the world's largest wetlands – and the Amazon are under consideration. Final prices of hotels and air tickets will heavily depend upon number of confirmed participants. Distances involved are huge, and prices of regular air tickets are correspondingly high (from US\$ 600 to US\$ 1,000). Flights are an absolute necessity for a 5 to 10-day tour, involving at least two or three main destinations.

A good and reasonable alternative is to purchase the Brazil Air Pass (Varig). It now costs US\$ 490 and buys you five flight coupons for five flights. All travel must be completed within 21 days. Based on the present situation, the Local Organizing Committee has decided only to schedule and organize longer post-conference tours to those participants who confirm the purchase of such a pass. Otherwise, final prices of the proposed tours will be two to three times higher. The Local Organizing Committee will also be glad to help you individually with all the information and help to travel in Brazil just after or before the conference.

Useful information about Brazil

Useful information and practical advice about the country are exhaustively presented in the Brazil volume of the Lonely Planet series of tourist guides. Also take a look at:

<http://www.lonelyplanet.com/dest/sam/bra.htm>

<http://darkwing.uoregon.edu/~sergiok/brasil.html#Welcome>

For detailed information on Curitiba and many other tourist spots in Paraná State, don't miss the web site <http://www.pr.gov.br/turismo/gerali.html> (pages available in several languages).

Flight connections - There are a number of daily flights from Rio de Janeiro, São Paulo and Porto Alegre International Airports to Curitiba International Airport. Details on transportation from Curitiba airport to downtown will be provided in the third circular.

Conference Web Page

To find updated information on the 7th International Conference on Copepoda, take a few minutes for visiting the Conference web site at the following Internet address:

<http://www.cem.ufpr.br/icoc.htm>

Contact information

Rubens M. Lopes – Local Secretary
Centro de Estudos do Mar
Universidade Federal do Paraná
Trav. Alfredo Bufren 140,
térreo (Anexo PRPPG)
80.020-240 Curitiba (PR), Brazil
Fax: 55 41 455-1105
E-mail address: rmlopes@cem.ufpr.br

Conference Workshops

Several conference workshops are presently under consideration. Three workshops have been already approved by the Local Organizing Committee. If you would like to suggest and coordinate a pre- or post-conference workshop, please contact Rubens Lopes. Brief manifesto's of the three workshops are presented below.

Pre-Conference Workshop**Copepod Diversity in Neotropis:**

Present knowledge and new directions for research

21 – 23 July 1999

Convener: Carlos E. F. da Rocha

Depto de Zoologia - IBUSP, Caixa Postal 11461, 05422-970 - São Paulo, Brazil

E-mail: ☐HYPERLINK "mailto:cefrocha@usp.br" ☐cefrocha@usp.br ☐

Fax: 55 11 8187513, 55 11 8187416

Scope

The purpose of the workshop is to bring people together to present and discuss up-to-date knowledge on the diversity, distribution and study methods of different copepod taxa, focussing on those from the neotropical fauna. We expect to be able to identify copepod groups as well as geographical areas or habitats which are in need of better investigation. The workshop would also provide the opportunity to exchange information on government programmes from different countries regarding the study of biodiversity, and to discuss possible collaborations between individuals or research groups. The workshop will primarily deal with continental waters, including fresh, saline and brackish water environments, but contributions dealing with coastal marine waters and coral reefs are also welcome.

Format and Venue: The workshop will be hosted by the Marine Biology Station of the University of São Paulo, in São Sebastião, State of São Paulo. The station provides lodging and boarding facilities plus a lecture room for about 40 attendants. There is an equipped laboratory for practical work and for training of small groups of participants (about 10) in methods of copepod field work and identification. A limited number of participants can be accommodated in the nearby town of São Sebastião. Formal presentations of 15 to 20 minutes will be restricted to the first one or two days of the meeting. People conducting projects on copepod diversity or who have worked on diversity in the Neotropical Region in the past will give presentations on the current state of knowledge in their particular groups. In addition, renowned specialists will be invited to contribute general information on the taxa they are experts in, as well as to take part in the discussions on the third day, when participants will be requested to propose recommendations aiming at the establishment of priorities in conducting future studies on neotropical and, where possible, worldwide copepod taxa. The evenings would be available for informal discussions, or practical laboratory work, on a particular taxon. Workshop fees and boarding charges will be determined at a later stage, but will be kept to a minimum, so as to stimulate the participation of students and non-senior copepodologists. The workshop might be followed by an excursion along the northern riviera of the State of São Paulo. Whoever is interested in participating, please contact the organizer at your earliest

convenience (by September 1, 1998). Your suggestions and proposals which groups of copepods should be dealt with would be much appreciated.

Working language: English

Post-conference Workshop - Canthocamptidae Discussion on the taxonomic muddle of the major family of fresh water Harpacticoida

Saturday, 31 July (morning)

Convener: F. Dov Por

Hebrew University of Jerusalem and Departamento de Ecologia – IBUSP, São Paulo

E-mail: ☐HYPERLINK "mailto:por@netvision.net.il"☐☐por@netvision.net.il☐

Fax: 972.2.6416831

A few points and ideas to help organizing our thoughts. The statements are mere "working hypotheses", which need further investigation. For the sake of the copepodologists of other breed, the Canthocamptidae are harpacticoids overwhelmingly living in continental waters, from the Arctic to the Antarctic islands, in all the imaginable types of water bodies and wetlands. The other cosmopolitan freshwater family, the Parastenocarididae, are subterranean only. The rest of the freshwater harpacticoids are a few genera, belonging either to subterranean families or, like the Phyllognathopodidae, to a primitive, probably very old and cosmopolitan species stock. The present system of the Canthocamptidae was established by Chappuis between 1928-1933 and accepted with many reservations by Gurney, Lang and others. Despite unanimous criticism it has not been replaced by any new system. The lack of good descriptions and the impossibility of obtaining type material, have rendered the task of revising the family almost impossible. The resulting chaos needs a collective effort of some form. Here are a few ideas for a first discussion on Canthocamptidae.

General considerations

The family contains today some 700 species. The family status of the marine genera, except *Mesochra*, is problematic, which leaves for our discussion some 650 species. Because of the difficulties which discourage describing new species in this family, the number of species to be expected is at least one order of magnitude higher. The complex *Attheyella* -*Elaphoidella* -*Bryocamptus* contains today some 500 species. The features that define today these genera are fluid and often subjective. This is a real trash box in which more newly described species are placed every year. On the assumption that *Mesochra* is the marine genus which originated all the freshwater canthocamptids, some clear apomorphies of the freshwater canthocamptids have to be found (like lack of articulated rostrum, shape of genital field, more advanced leg dimorphism, etc.). Borutzki is probably right in proposing a special position for *Epactophanes* (perhaps not in the Canthocamptidae) because of the shape of the receptaculum, the very peculiar P3 endopodite of the male, and the presence of a 6th naupliar stage. There is a long list of reductive features which most probably evolved repeatedly: reduction of the endopodite articles, reduction in the leg armature, fusion of the CV exopodite to the basendopodite; reductions in the mouthparts, etc. Such features are often useless in disentangling the canthocamptid mess, if not associated with other, more reliable features. The presence of a prehensile P1 endopodite singles-out *Attheyella* subgen. *Mrazekiella*, and *Canthocamptus* as probably the most primitive freshwater Canthocamptidae. Some reductive features, such as the biarticulated P1 exopodites of *Maraenobiotus* and *Hypocamptus* or the reduced armature of the P5 endopodite of the female in *Echinocamptus* are perfectly useful synapomorphies. Positive features, real possible synapomorphies should be looked for in the structure of the receptaculum, the dimorphism of the furcal branches and the structure of the male exopodites and endopodites, the shape of the nuchal organ, the structure of the operculum, and possibly the details of the body spinulation. Considering the extreme importance of the dimorphic features, no species diagnosis should be considered valid without description of the male. The assumption that some species, like in *Elaphoidella*, are parthenogenetic and not just poecilandric, should be further investigated. There are sufficient grounds to raise the status of the subgenera of *Attheyella* to a generic rank, i.e., *Attheyella* (s. str.), *Mrazekiella* (the previous

name *Brehmiella* is preoccupied), *Chappuisiella*, *Delachauxiella* and *Canthosella* and in this way to dispose of this oversized genus. The other macro-genus, *Elaphoidella*, has to undergo a similar splitting. It is clear that all the species with the peculiar "staghorn" spines on the exopodite P4 of the male, like in *E. elaphoides*, the nominate species of the genus have to be placed under a genus *Elaphoidella* (s.str.) and separated from the others. Some of the other described species eventually belong to *Attheyella* (s.l.). The *Bryocampus* complex has today one clearly defined group, this would be genus *Arcticocampus*, with typical furcal setae and production of resting eggs. The large genus *Moraria* is reasonably well defined by its morphological features and subterranean way of life.

Zoogeogeographic considerations

In general, the distribution of the Canthocamptidae indicates a Pangean origin, and therefore vicariant biogeography will probably be of great help to define also phylogeny and the generic inventory. There are indications that the most primitive groups are Holarctic-Laurasian. Probably the highest diversity is found also in the northern continents. Several genera, such as *Canthocampus*, *Attheyella* s.str., *Mrazekiella*, *Arcticocampus* and *Moraria*, are typically holarctic. Lake Baikal is the home of tens of endemic species, and eventually of genera. This fact should be brought to wide knowledge, because of the environmental dangers this lake is facing. The Gondwanian fauna is well defined: *Chappuisiella* and *Delachauxiella* from South America to Indonesia and *Canthosella* in Indonesia. The African fauna is poorly known, but the dominating *Echinocampus* and *Elaphoidella* s.l. are also found in European subterranean waters. The neotropic presence of *Elaphoidella* s.l., needs further investigation. The fauna of the Indian subcontinent and of Madagascar are virtually unknown. Only large (and old?) islands have their own canthocamptid fauna, such as Cuba or the Antarctic islands. What are the limits? The parallelism in the distribution of the Canthocamptidae and of the Parastenocarididae, mentioned by several authors, needs further attention. The genera *Maraenobiotus* and *Epactophanes* are probably passively dispersed. The occurrence and the morpho-physiology of resting stages in Canthocamptidae should be more investigated.

General recommendations

To establish a permanent Canthocamptidae working group within WAC, which will also regularly meet during every conference. To make an effort to discover the whereabouts and to study the types of Chappuis and of others. To stimulate and perhaps support revision work by young taxonomists. To try to fill-out the geographical gaps.

Post Conference Workshop: Chromatin diminution: Methods for finding number of chromosomes, measuring genome size, and assaying for chromatin diminution

Saturday, 31 July (morning and afternoon)

Conveners:

Grace Wyngaard (Department of Biology, James Madison University, Harrisonburg, VA. U. S. 22807) and Ellen Rasch (James H. Quillen College of Medicine, East Tennessee State University, TN, USA 37604)

Squashes of copepod chromosomes and nuclei can yield estimates of genome size and inform us about the diploid number of chromosomes for resolution of taxonomic problems, speciation events, and presence/absence of chromatin diminution (the excision of somatic cell DNA during embryogenesis). To date, genome sizes are known for 13 freshwater cyclopoids, 1 marine cyclopoid, 13 marine calanoids and 1 freshwater harpacticoid species. In this workshop we will squash live embryos and adults on subbed slides and stain preparations with the Feulgen reaction for DNA. We will observe slides for qualitative results at the workshop. We will also prepare orcein squashes which are useful for immediate observation of chromatin diminution. After the conference, Ellen Rasch will use a scanning and integrating microdensitometer (Vickers M-86) to estimate genome size for individual species of copepods. We invite you to contribute your specimens and join us in a publication of genome sizes in copepods. Please contact Grace Wyngaard (wyngaaga@jmu.edu) if you have any questions.

“ THE NEW PANORAMA OF ANIMAL EVOLUTION “

The New (XVIII) International Congress of Zoology
Le Nouveau (XVIII) Congres International de Zoologie
Athens, Greece 4 - 9 September 2000
October, 1997

FIRST CIRCULAR

In 1889 the First International Congress was organised by P. Blanchard in Paris. It is now 26 years since the last International Congress of Zoology was held in Monte Carlo. The most serious consequence of the cessation of the congresses has been a tacit recognition of the general depreciation of Zoology in the academic world. However today, Zoology is more alive than ever. We are ready to try to bring forward again, the rich unifying aspects of Zoology. After the positive reaction of the international community of zoologists to our initiative and the support of a number of national organisations, the date of the New Congress has been set for 4-9 September 2000 and the venue will be the Faculty of Philosophy, at University of Athens, Greece.

In order to reverse the present trend of fragmentation of Zoology and the crisis in the professional zoological education which became rampant after the suspension of the congresses in 1972, we have decided to dedicate this first renewed congress to a number of integrative symposia and general discussions. We call upon you to participate!

General symposia, proposed themes (Those marked with * have already a convenor)

A1*. The new palaeontological picture; A2. Macro- and megaevolution: integration of molecular and morphological data; A3*. The Integrative Approach for the Study of Animal Evolution; A4*. Comparative and evolutionary immunology; A5. The new embryology and developmental biology; A6* The Role of Parasitism in Animal Evolution; A7* The Protozoan-Metazoan Boundary; A8. Zoological roots of anthropology
Ad-hoc symposia proposed so far:

B1. History of Zoology from Aristotle to the modern crisis; B2. Modern biogeographic methods applied to the Tethys region; B3. Cloning and cryopreservation

General discussion themes suggested till now are::

C1. Zoological and taxonomic education; C2. The hot spots of animal conservation ; C3. Reference collections and Data Bases.; C4. Zoological Nomenclature and the new “Biocode”; C5 The “Tree of Life” project.

Poster sessions will be organised around the themes of the symposia.

Parallel events are being considered

The symposia will be organised by convenors and present reviews and viewpoints, leaving also ample time for recorded discussions. The addresses of the convenors can be obtained on request.

Those interested in theme C4 can access

<http://www.york.biosis.org/zrdocs/codes/biocode.htm> and comment to iczn@nhm.ac.uk

International Initiative Committee Prof. Bruno Battaglia, Padova;
Prof. Dan Brooks, Toronto; Prof. Edwin Cooper, Los Angeles; Prof. Vassili Kiortsis, Athens; Prof. Claude Levi, Paris; Prof. Paulo Nogueira Neto, Sao Paulo; Prof. Francis Dov Por, Jerusalem; Prof. Song Da-xiang, Beijing

First Organising Committee: Drs. Rosa Polymeni, Anastasios Legakis ,
Spyros Sfenthourakis, Maria Thessalou-Legaki Athens; Drs. Leah
Gavish and Francis Dov Por, Jerusalem.

Please inform us of your intention to participate and/or receive
further information, sending the form attached to this issue of MONOCULUS to
Dr. Rosa Polymeni, University of Athens, Department of Biology, Section
of Zoology and Marine Biology, 15784 Athens, Greece.
Tel. 30.1.7264364, Fax 30.1.7284604, e-mail rpolymer@biology.db.uoa.gr
The form can be seen and copied also from our page in
http://www.york.biosis.org/zrdocs/new_icz.

LETTERS LETTERS LETTERS

Report on Sealice (Copepoda: Caligidae) Workshop

Caligid copepods, particularly *Lepeophtheirus salmonis* and *Caligus elongatus*, known as sealice - are the biggest health hazard for the salmon farming industry, causing an estimated loss of about 10 % of production. Under the auspices of a European Union funded concerted action proposal (coordinated by Mark Costello, Dublin) a workshop was held in Trondheim, Norway from 6th to 8th November 1997. About 60 delegates attended including sealice researchers, vets and representatives from the fish farming industry across Europe, North America and Japan. The workshop was organised by Kjell Maroni and Per Kvenseth both from KPMG management consultants.

The workshop was the first in a series of three, each focused on a different aspect of the sealice problem. In Trondheim the focus was sealice monitoring and control - and one product of the meeting will be a standardised protocol for counting sealice.

The next meeting will be held on 3 days - 22nd to 24th July 1998 - during the Fourth World Crustacea Conference in Amsterdam. The focus of that workshop will be sealice biology and anyone interested in parasitic copepods is encouraged to attend.

The Amsterdam workshop will be coordinated by Geoff Boxshall and details are available either on the Sealice website:

	http://www.ecoserve.ie
or from Geoff Boxshall	g.boxshall@nhm.ac.uk
or Mark Costello	mcostello@ecoserve.ie

The sealice group produces a newsletter called "Caligus" and if you work on parasitic copepods and would like to receive this newsletter, please contact M. Costello.

G.R.F. Boxshall (London)

An open letter to the copepodological community

Dear colleagues,

This is to report an unhappy situation that has developed in regard to the Friedrich Kiefer Copepod Collection, housed at the Staatliches Museum für Naturkunde Karlsruhe in Karlsruhe, Germany. Dr. Hans-Walter Mittmann is the person responsible for the collection.

As every taxonomist knows, the Kiefer Collection is of inestimable value for systematic research on freshwater and many marine families worldwide, containing as it does thousands of excellently preserved samples and many type specimens. The Staatliches Museum für Naturkunde made an excellent beginning in cataloguing the collection (Franke, 1989), and early in this decade Dr. Mittmann was most helpful in responding to requests for loans.

However, in recent years Dr. Mittmann has responded to none of our requests to borrow material. Although by all reports he has been a generous host to colleagues who have been able to visit Karlsruhe personally, his complete lack of response to written inquiries has been puzzling and frustrating. Moreover, several of our research projects have been compromised or even completely stalled by lack of access to these specimens. For us as for most of our colleagues, travel to Karlsruhe is difficult or impossible.

We are at a loss to comprehend the reasons for this behaviour. We can only suppose that the burden of dealing with correspondence and loans has become too much for Dr. Mittmann, who is not a carcinologist, or that the Staatliches Museum für Naturkunde is unable to fund the necessary postage costs. We are also aware of at least one loss in the mails, and would understand any reluctance to ship material (registered mail is available, however). In our view it is the responsibility of the WAC to ensure that collections of this value and importance are adequately funded and administered by an appropriately qualified specialist.

We would greatly appreciate responses from those of our colleagues who have information on this matter and the current situation at the Karlsruhe Museum.

PS: Franke, U. 1989. Katalog zur Sammlung limnischer Copepoden von Prof. Dr. Friedrich Kiefer. *Carolinae* 5: 1-433.

Dr. Suphan Karayutug
Department of Zoology, The Natural History Museum,
Cromwell Road SW7 5BD, U.K.

Dear Oliver, Hans, and Suphan,

Wonders of wonders, the *Bryocyclops* specimens from the Kiefer Collection just arrived! (There was no accompanying communication from Dr. Mittmann, only forms.) Apparently Oliver's letter to his boss worked. Many, many thanks, Olli, for your trouble.

I just learned that Chad Walter has also, over the course of several years, made several requests for material from the Kiefer Collection, with the same nil response as received by me and Suphan. I explained to Chad what we have been doing, and asked him to renew his request and to keep me informed of the results. I will let you know what happens.

In spite of this one positive result, I feel that the main point of Suphan's and my letter to Hans still stands: That the orphan Kiefer Collection, because of its unique importance, deserves to have someone who is at least a carcinologist and sympathetic to the needs of the world copepodologist community to administer this treasure. Even a qualified technician who does not travel would be better than the present situation. If the Karlsruhe Museum cannot provide such a person, perhaps it would be better to move the collection to an institution that can.

In this connection, I was delighted to learn just now from Thomas Glatzel that Ulrich Einsle's material and library are now at Oldenburg. The Oldenburg group is eminently able to take the best possible care of it. I also hope to learn that you can get a student or two interested in carrying on Uli's work on *Cyclops* and other such difficult groups.

With best wishes to all, and thanks for your continued involvement.

Janet Reid (Washington)

Notes from WAC-members

Having been retired for some years and no longer involved in Crustacean studies, I wish to resign my membership of the WAC. Please advise if I am owing any money for subscription.

Alan E. Joyce (Scotland)

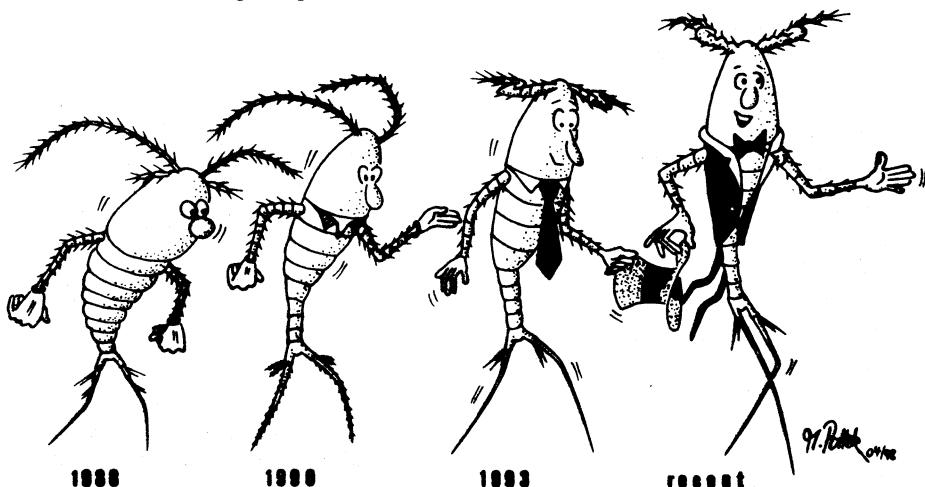
Herewith I would like to withdraw my membership of the WAC at the next possible date. Since my return from the USA I am not involved with copepod research any more.

My former address was:

C. Metz
Skidaway Institute of Oceanography
University System of Georgia
10 Ocean Science Circle
Savannah, GA 31411, U.S.A.

Cornelia Metz (Neustadt, Germany)

copepod evolution



VISITING SCIENTISTS

Greetings. I am glad to apprise you that I have joined with Prof. Shin-ichi Uye, Faculty of Applied Biological Science, Hiroshima University as a JSPS Post doctoral fellow. I will be here until Feb. 1999. I am going to continue my research on microzooplankton in the Inland sea of Japan.

I shall be grateful to you if you could kindly change my India address and include this new address in the Monoculus newsletter mailing list so that I can exchange my upto date research activities with our copepodologist colleagues. Kindly let me know the shape of the 6th International conference on Copepoda-Proceeding volume as I paid during the conference. Please extend your kind help to get the same to my new address. Sorry for the trouble.

N. Godhantaraman (Hiroshima)

A Center for Tropical Reservoir Fisheries and Limnology in Sri Lanka

Reservoirs, not lakes, comprise the most widely distributed, large standing freshwater globally today. Perhaps the highest concentration of reservoirs in the world is found in Sri Lanka, a country of 65,600 km² with over 10,000 reservoirs. About 40 of these are over 500 ha in surface area (FSL). The majority that cover about 43 % of the total reservoir area are < 250 ha. The largest reservoir is about 80 km². While most reservoirs are in the low-country a few, especially large ones built recently, are sited in higher altitudes. The country cannot boast of large reservoirs like Kariba or Volta but the reservoirs do use water parsimoniously in an intricate irrigation system of cascades. The morphometry of reservoirs has been illustrated by Fernando and Indrasena (1969)..

The growing economic importance of the reservoir fishery has encouraged its study in many parts of Sri Lanka. A center for these studies has now become a need. The first step towards setting up such a center has already been undertaken by the Department of Zoology, University, University of Kelaniya. A library is being accumulated. Funding is now available for field research from both national and foreign sources. Among the collaborative research activities centered at the University of Kelaniya are: A project on reservoir fishery with Deakin University, Victoria, Australia is currently in progress under the auspices of The Australian Center for International Research: Project funding under the INCO-DC program of The European Commission supports research in reservoir limnology and fisheries jointly with The Royal Holloway and Bedford College, UK, The University of Vienna, Austria, Ecole Nationale Supérieure Agronomique, France, The University of The Philippines, Diliman and The National Inland Fisheries Institute, Bangkok, Thailand. Active research is also being carried out in cooperation with NARESA (National Aquatic Resources Research and Development Agency of Sri Lanka), Colombo and The Institute of Fundamental Studies, Kandy. These two local funding sources are for researchers in fisheries at the senior level and graduate students. Support is also provided for funding visiting researchers.

During the past two decades many students from the University of Kelaniya have proceeded to higher degrees at that University and abroad in aquatic sciences. A student completing his M. Phil was recently awarded a Tonnoli Fellowship by SIL to study tropical aquatic oligochaetes in Canada. Three projects in reservoir limnology and fisheries training M. Phil and PhD students are in progress at Kelaniya.

Sri Lanka offers a base of literature on aquatic ecology including a comprehensive manual on the fauna and fisheries (Fernando, 1990). Recent research activity in limnology and fisheries has attracted many researchers both local and foreign. It is hoped that courses in reservoir limnology and fisheries will be organized for postgraduate students using library and field facilities now available at the University of Kelaniya.

We are making an appeal for literature and other support from SIL members. For those travelling through Sri Lanka, we encourage visits to the center. Those wishing to give talks on their speciality are encouraged to do so. If adequate notice is given local arrangement can be made.

U.S. Amarasinghe (Kelaniya, Sri Lanka)
C.H. Fernando (Waterloo, Canada)

Some parasitic copepods have seized on a unique piece of ocean real estate.

Sure you have your Nobel Prize winners, your MacArthur genius awardees, your endowed chair holders at prestigious universities, but give me a scientist that I, common guy, can identify with. Give me a man like George Benz, who will roll up his shirtsleeves and, on any given day, slap the sucking mouth of a lamprey on his forehead to let the tail serve as a windshield wiper for his sunglasses.

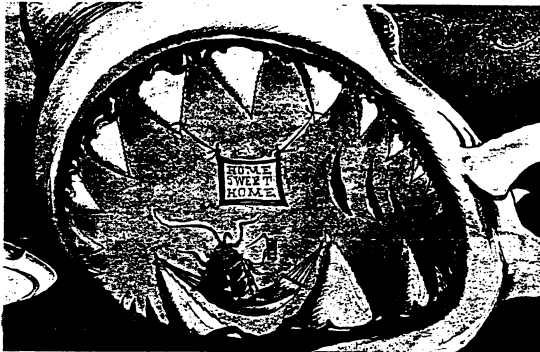
Perhaps a sense of humor is necessary when you take a stand that is out of sync with the lockstep of conventional science. Benz rails against ecologists. He fights the good fight in defense of disease. In particular, he champions the most reviled creatures in the animal world (after politicians) - namely, parasites.

Closest to his heart, though, are the little aquatic crustaceans called copepods, which live pretty much everywhere it's wet. Copepods live in salt water and fresh, cold water and hot, shallow water and deep. They live in marshes and bogs. If you've ever swallowed a mouthful of water while swimming in a lake or ocean, chances are excellent you've quaffed a copepod or two. *Bon appétit!* If insects are the most abundant animals on Earth, then copepods are the insects of the ocean. Benz goes further, flipping the thinking: „I like to annoy entomologists by referring to insects as the crustaceans of the land.“ These multitudinous copepods live among ocean plankton, thus helping form the first link in the food chain that starts with algae cells, then works its way up to the likes of Charlie the Tuna and Moose and Squirrel.

Copepods live on the fins of sharks. They live in the gills of sharks. They live in the noses of sharks, „presumably eating shark snot,“ says Benz cheerfully. They live between the teeth of the great white. „We know that a shark's jaw evolved from a gill,“ says Benz. „I figure this particular copepod thinks it's still living in a gill.“ One species of copepod even dangles like an earring from the eyeball of the Greenland shark.

For copepods, parasitism has worked especially well. They've lived successfully in their own little worlds for millions of years, says Benz. One fossilized parasitic copepod was discovered in Brazil in 1973, attached to the gills of a bony fish that dated back to the lower Cretaceous, more than 110 million years ago. Benz believes copepods lived even earlier than that. „I commonly see copepods that look much more primitive than that fossil,“ he says. „The fact that that fossil is not startlingly primitive, and has some advanced characteristics about it, suggest that copepods go back much further in time, perhaps as much as 400 to 500 million years ago. Now, that's successful.“

In the Nose of Jaws



Some parasitic copepods have seized
on a unique piece of ocean real estate.

Pity the beleaguered shark, then, which carries more types of these pests than humans do. „We think of animals that carry parasites as being sick,“ Benz says, „but that’s not necessarily so.“ He tells me that a blue shark, for example, can carry enormous numbers of copepods - 100 on the fins, 4,000 in the gills, and 400 in its schnoz, giving the shark, says Benz, „the equivalent of a perpetually stuffed-up nose.“ In addition, reasonably healthy blue shark can carry something like 10,000 individual tapeworms, thus becoming what Benz calls a floating hotel for parasites. Each tapeworm, of course, places what Benz euphemistically calls a small tax upon the host but which the nonpartisan might describe as consumption of the host.

„You haven’t lived until you’re standing on a boat in a pile of half-dead, snapping sharks, trying to get your samples.“

Benz got hooked on copepods, as it were, while in graduate school. Although he’d originally wanted to study sharks, his plans were diverted by a course in parasitology he had to take to graduate. It turned out that the parasitologist who taught the course knew more about sharks than anyone Benz had met. „That’s when I learned that parasitologists have to know a little bit of everything,“ he says. They need to understand the anatomy and phylogeny not only of the animal they’re interested in but of its host as well. And they need to understand the environments of both.

That’s his bug about ecologists. „Freeliving researchers“ - Benz-speak for biologists who study nonparasitic animals - „should be studying the total environment too, but they don’t,“ he complains. „I don’t like to rag on them, but if one-half to two-third of all animals are parasitic, it seems as though half the ecologists should be studying parasites. But they’re not.“ This is important, says Benz, „because the bulk of what we call biodiversity isn’t lions and tigers and bears. It’s the little animals that support all these larger animals. And no matter how small the animal, they all have parasites. Even the parasites have parasites.

„In addition, parasites are probably responsible for a lot of the diversity we see in free-living animals. They’ve influenced that diversity through time by the tax they impose.“ Parasites cause disease and something kill their hosts, Benz grudgingly admits, but that process has surely influenced the gene flow of species by preventing some animals from passing on their genes. The ability to scuffle and sort the genetic potential of their hosts means that parasites have helped chart the evolutionary paths of the free-livers. In other words, parasites have helped shape biodiversity as we know it. „So parasites get a bad rap, but they probably shouldn’t,“ says Benz.

„That gives even more value to parasites. Because we can use parasites to study the phylogeny of the host, which allows us to ask the larger questions.“

As I dab at my shirt, I realize that Benz’s parasitic proselytizing is going to be a steep, uphill struggle. And I don’t care what he says, I’m not about to let a botfly maggot homestead on my scalp. Still, Benz has helped me develop a respect for parasites. Bob, may you live long and prosper.



by Mark Wheeler
(Discover, New York, March 1998) 19 (3): 36-39.

CANDIDATE MEMBERS

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Estela is interested in the taxonomy, abundance, and distribution of planktonic, marine copepods from Antarctic waters.

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Danny studies symbiotic copepods associated with invertebrates.

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Deo studies zooplankton in general.

FERNANDEZ-PUELLES, McLuz
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He is interested in zooplankton in general and particularly in copepod ecology.

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Interests: Cyclopoida, ecology, biogeography, taxonomy

LEE, Nga Wing Christine
The Swire Institute of Marine Science
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e-mail: nwclee@hkusua.hku.hk

Nga Wing Christine is interested in the ecology of copepods, particularly the spatial and temporal variation of copepods. She wrote:

„I am glad to be a member of WAC. I am a Ph. D. student at the University of Hong Kong, under the supervision of Prof. Brian S. Morton. I obtained my B. Sc. degree in the same university in Environmental Science in 1996. I am now carrying out my research in a shore-based laboratory, the Swire Institute of Marine Science, at Cape d'Aguilar Hong Kong Island.

My research subject is mainly concerned with the diversity of copepods in and around the Cape d'Aguilar on Hong Kong Island.

My research subject is mainly concerned with the diversity of copepods in and around the Cape d'Aguilar Marine Reserve. I have collected monthly samples of plankton last year to examine temporal variations in the copepod community, to identify seasonal variations in species composition, relative abundance, and size frequency distributions.

My particular research interest is to investigate different biotic and abiotic influences on the local copepod communities and to try and construct the first planktonic food web for Hong Kong waters.

My newest project is to obtain data related to the seasonal ingestion rate of harpacticoids and their relationship with an invertebrate predator: the Chaetognatha. I am also going to investigate tidal influences on the copepod community in the marine reserve, a semi-exposed habitat. I look forward to the coming spring issue of MONOCULUS.“

Lee Nga Wing, Christine (Hong Kong)

ZWERVER, Satu
Kuninkaankatu 137
Dalkarby
FIN-25700 Kemiö
FINLAND

Research interests: Identification of freshwater copepods using characteristics that can be easier than the 5th leg, ecology of freshwater copepods and their bioindicative use.

Current projects: Preparing an identification key for the freshwater copepods of the Netherlands based on easily seen characteristics.

Future interests: The copepod fauna of Finland and the ecological value of copepods.

Satu, Zwerver (Kemiö, Finland)

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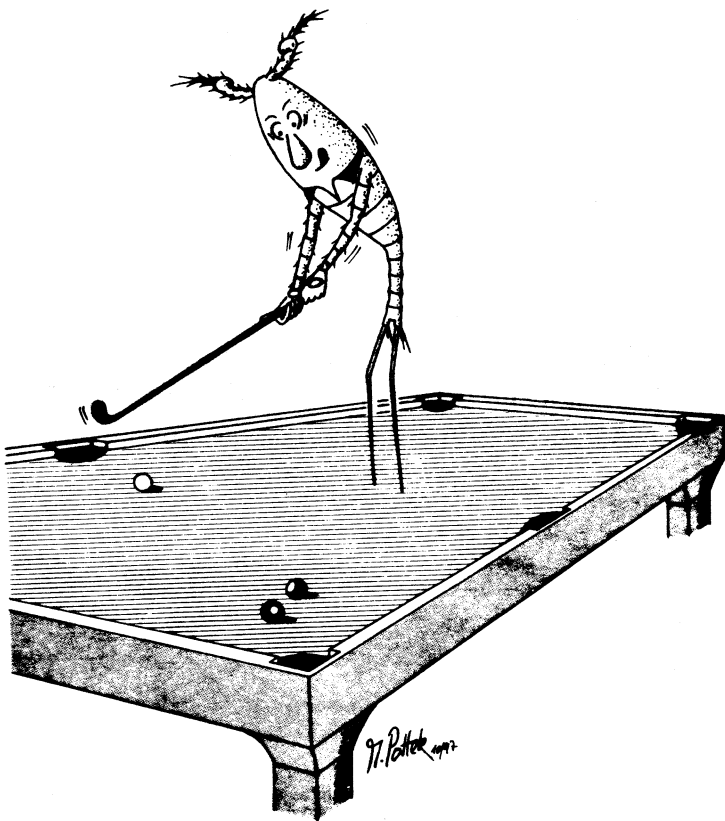
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Charles Branch Wilson (1861-1941) was the author of numerous works on Copepoda and Professor of Biology at the Massachusetts State Teachers College at Westfield. For many years he held the honorary appointment of Collaborator at the U. S. National Museum (now National Museum of Natural History), Smithsonian Institution. Most of the Museum's collection of copepods was entrusted to him for study, and the results of much of his research were published in the Proceedings and Bulletin of the Museum. Wilson bequeathed to the Museum his extensive library of copepod and argulid literature, together with his card files. The latter included a card for the author of each published work, and a card for each species and genus listing all known published references to that taxon, i.e. a Synonymy. The donation also included Wilson's original illustrations, dismounted from their plates, and extra reprints of his own works.

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(1997 Edition)

by Philippe BODIN



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