



WORLD ASSOCIATION OF
COPEPODOLGISTS

MONOCULUS Copepod Newsletter

The Newsletter of the World Association of Copepodologists

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Message from the President

We are now fast approaching the 11th International Copepod Conference in July 2011 in Mexico. I hope you are all strongly considering attending to enjoy the outstanding venue and an interesting, relevant programme. I know that a symposium on "Molecules vs morphology: why can't they be friends?" is being organised. This will be an important contribution to bridging the gap between those of us whose phylogenetic work centres on copepods as morphological entities and those who use genes as their data sources. Neither approach seems to provide quite enough data for us to come to robust conclusions about deep relationships within Copepoda. How much more effective we can be if we join forces!

As President, I have been working on the agenda for the business meeting. So far I have the following agenda:

1. Major activities of the WAC for the term 2008-2011

- I. Report from President
- II. Report from Editor: *Monoculus* and literature supplements
- III. Report from Treasurer, accounts, new membership and payment system
- IV. Report from Pedro Martínez on development of the new WAC web site, its content management system (CMS) and interface with the membership database.
- V. Report from Local Secretary
- VI. Open for comments from the floor
- VII. Presentations on:
 - i. WORMS copepod website – new editors
 - ii. Review of the bibliographic database
 - iii. Overview of the membership database
 - iv. New online PayPal membership dues payment process

2. Elections

3. Proposals to hold the 12th International Conference on Copepods in 2014

I have had a pleasing response to requests for Executive Committee members to stand for election again. We haven't yet identified any members who are willing to stand for election as President. We also need to find someone to take the reins as *Monoculus* editor after Janet Reid's sterling efforts which have set the standard. Janet has served us all outstandingly through her production of such an informative, nicely laid out publication. Please contact me [j.grieve@niwa.co.nz] if you know of anyone who would like to volunteer for these jobs or be nominated for election.

Organisation of the pre-Conference Training Workshop on Morphology and Systematics of Copepods is now complete and there is a great line-up of presenters (see below).

I would also make a plea for copepodologists to support WAC by paying a subscription, becoming a sponsor or life member.

— Janet Bradford-Grieve, President
National Institute of Water and Atmospheric Research,
New Zealand



MERIDA, MEXICO 2011

**Training Workshop on Morphology
and Systematics of Copepods
Chetumal, Quintana Roo, Mexico
(04 – 08 July 2011)**

Venue

The course will take place at El Colegio de la Frontera Sur (ECOSUR) in Chetumal, Quintana Roo, where adequate facilities will be made available for both theoretical and laboratory sessions. Chetumal (Chactemàal which means „Place of the red wood“ in Modern Maya) is a city on the east coast of the Yucatán Peninsula. It is the capital of the state of Quintana Roo which borders the states of Yucatán and Campeche to the north and west, the Caribbean Sea to the east, and the nation of Belize to the south. Chetumal is situated near the mouth of the Río Hondo on the western side of Chetumal Bay, a large estuarine system separating Mexico and Belize.

Objectives

The objective of the course is to provide postgraduate students/postdoctoral fellows with a comprehensive and state-of-the-art introduction to the diversity, morphology, systematics and biology of benthic, planktonic and symbiotic copepods, including training in technical skills. The course will cover marine, brackish and fresh water forms.

Tutors

The course will be taught in English by an international team of nine tutors. Each tutor is an internationally renowned specialist in a different area of copepod systematics. The tutors will be:

Dr. Ruth Böttger-Schnack (Leibniz Institute of Marine Sciences (IFM-GEOMAR), Kiel, Germany)

Professor Geoff Boxshall (Natural History Museum, London, U.K.)

Professor Anton Brancelj (National Institute of Biology, Ljubljana, Slovenia)

Dr. Samuel Gómez (Instituto de Ciencias del Mar y Limnología - Unidad Académica Mazatlán, Sinaloa, Mexico)

Professor Ju-shey Ho (California State University, Long Beach, U.S.A.)

Professor Rony Huys (Natural History Museum, London, U.K.)

Dr. Terue Kihara (Deutsches Zentrum für Marine Biodiversitätsforschung (DZMB), Wilhelmshaven, Germany)

Professor Susumu Ohtsuka (Takehara Marine Science Station, Hiroshima University, Hiroshima, Japan)

Dr. Janet Reid (Virginia Museum of Natural History, Martinsville, U.S.A.)

Course Structure

The course will last five days and will comprise a combination of lectures, laboratory-based practical sessions and informal, problem-solving discussions. Every tutor will be in attendance for all of them. Flexibility will be maintained to encourage the development of an intense group dynamic through interactions between highly motivated young researchers and established workers. Students will be asked to bring material with them that is of special interest or significance in their own work – particularly their problem species. A typical course day will consist of two 1.5-hour lectures alternated with practical sessions.

Course Content

1) *Introduction to Copepod Morphology, Ordinal Classification and Phylogeny* (Tutor: Rony Huys)

This session will provide a brief overview of copepod morphology and diversity and introduce participants to the impressive range of body forms and limb types across the Copepoda. Trainees will be introduced to the standardized terminology used in the description and identification of free-living and symbiotic copepods. An overview of the basic functional morphology of the reproductive, locomotory and feeding systems will be presented, and the importance of the various sensory structures encountered in copepods will be discussed. Finally, a brief synopsis of the current ordinal classification system will be presented, including some recent developments in our phylogenetic understanding of the group.

2) *Taxonomic Techniques for the Study of Copepods* (Tutor: Terue Kihara)

This lecture aims at students becoming familiar with the basic methods used in taxonomic studies of copepods. Topics will include procedures to extract material, fix, preserve, stain and sort samples. The presentation will also demonstrate how to produce adequate equipment to manipulate and dissect copepods and how to prepare temporary and semi-permanent slides, focusing especially on the clearing, staining, mounting and dissecting techniques. The information content of taxonomic illustrations will be discussed, and detailed information on preparing line drawings, inking techniques and image editing will be provided. Finally, participants will be introduced to the various methods used in transmission and scanning electron microscopy, and confocal laser scanning microscopy.

3) *Diversity of Copepod Life Cycles* (Tutor: Geoff Boxshall)

When I first looked at a freshly caught sample of plankton I was struck by the abundance of larval copepods. This immediately makes identification harder since most of the taxonomy was established on the basis of adult morphology, and life cycles are unknown for the vast majority of copepod species. However, free-living copepods exhibit a standard developmental pattern, which facilitates the recognition of particular stages. The typical copepod developmental pattern of six nauplius stages plus six copepodid stages, of which the final stage is the adult, will be described along with the most notable variations on this pattern. In parasitic copepods life cycles are often shortened and patterns of abbreviation will be reviewed. Some extreme life cycles in very heavily metamorphic species will be briefly examined. Nauplii can be lecithotrophic or planktotrophic, and the distribution of these alternative strategies will be introduced.

4) *Marine Plankton I: Systematics, Morphology and Feeding in Calanoid Copepods* (Tutor: Susumu Ohtsuka)

Participants will be introduced to the major calanoid families and the morphological characters used to distinguish them. The feeding strategies of calanoid copepods will be reviewed from morphological and evolutionary points of view. Calanoids can be classified into several types depending on the structure of their feeding appendages. The three different groups of particle-feeders differ primarily by the structure of the maxillae and maxillipeds, while carnivorous types are much more diversified in the oceanic regions. In the family Heterorhabdidae a venom-injection system is employed to catch prey animals. Such system could have evolved as a result of modifications of the feeding appendages and secretory glands of primitive particle-feeding heterorhabdids. Highly specialized carnivory is found also in the family Candaciidae whose members show a preference for gelatinous zooplankters. Detritivorous families, such as Scolecitrichidae and Phaennidae, bear two types of chemosensory setae on the maxillae and maxillipeds, *i.e.* worm-like and brush-like setae, which may have different functions. The deep-sea phaennid genus *Cephalophanes* exhibits a special preference for detrital matters originating from crustacean zooplankters. The elaborate eyes seem to play a role in the search for crustacean detritus, in concert with the sensory setae on the mouthparts.

5) *Marine Plankton II: Introduction to Non-calanoid Copepods* (Tutor: Ruth Böttger-Schnack)

This seminar will provide an introduction to the main non-calanoid groups/families of marine planktonic copepods, including information about their morphological traits, geographical distribution and ecological role in various marine habitats, climatic zones, and depth regions. Particular attention will be paid to the numerous small-sized species of the family Oncaidae, which is one of the most abundant non-calanoid copepod families in oceanic areas. Gaps in the state of knowledge will be highlighted, related especially to sampling and identification problems. Specific methods for handling and identifying these small species will be presented, focussing first on group characters, to be seen on whole specimens under the microscope, and as a second step, on dissection methods that allow analysing specific morphological details required for species identification. In addition to traditional methods for species identification and phylogenetic studies, opportunities and drawbacks of genetic methods (barcoding) will be discussed and the advantage of combining both methods be explained.

6) *Marine Benthos: Morphology and Systematics of Harpacticoida* (Tutor: Samuel Gómez)

Marine meiofauna is well known for its high abundance in relatively small samples, for its close relationship with the sediment (where most pollutants are found), for its lack of planktonic larvae, for its limited dispersal capacity, and for being a very important source of food and energy for crustaceans and (larval) fish. Despite its ecological role, studies about the ecology of meiofauna from Mexican, Central and South American brackish and marine systems are very scarce. The lack of a long-standing tradition in the study of meiofauna in these regions has led to a scarcity of researchers interested in the study of these communities, a genuine reflection of the difficulties faced when working with meiofauna. This is particularly symptomatic for the study of harpacticoid copepods, the most numerically important meiofaunal group after the nematodes. Analysis of temporal and spatial variation in copepod abundance and taxonomic composition has proven to be a reliable tool for the assessment of the health of marine and brackish ecosystems. However, the difficult taxonomy of harpacticoids has traditionally been viewed as a serious impediment to such assessments, particularly in regions where adequate taxonomic expertise and guidance are lacking. In this workshop, the importance, advantages and problems in the study of meiofauna will be presented, and students will be introduced to the taxonomy of harpacticoid copepods, its second most abundant component.

7) *Freshwater Benthic Copepods: Introduction to Morphology, Systematics and Biology* (Tutor: Janet Reid)

An introduction to the orders Cyclopoida and Harpacticoida, which have numerous representatives in freshwater benthic habitats, and to the small freshwater order Gelyelloida will include a description of their basic body plans, the distinguishing points of the families and some representative genera, and an overview of their biology and ecology. Students will practice techniques for manipulating specimens and observing the morphology of cyclopoids and harpacticoids, and will use basic taxonomic literature to identify examples.

8) *Taxonomy, Ecology and Biogeography of Groundwater Copepoda* (Tutor: Anton Brancelj)

Freshwater Copepoda can be found in epigeal habitats as well as in groundwater. In groundwater they inhabit a wide array of habitats in porous aquifers as well as karstic caves. Their biodiversity and level of endemism are generally very high. Copepods are the most abundant group in many groundwater habitats, especially in gravel bars along rivers and in percolating water in the caves. In these habitats they are important elements in food webs which determine the

quality of groundwater. They are especially important in the hyporheic zone between surface rivers and groundwater, where surface water enters the subterranean environment. In the last two decades knowledge on groundwater Copepoda increased significantly since many specialists turned their interest to research of groundwater worldwide. Participants of the pre-conference workshop will be introduced to the taxonomy, ecology and biogeography of groundwater copepods. Special attention will be paid to sampling techniques, some of them specific for groundwater aquifers. Although participants are encouraged to bring their own samples to work on during the workshop, some material will also be obtained by the tutor.

9) *Symbiotic Copepods Using Invertebrate Hosts: Diversity and Adaptation* (Tutor: Geoff Boxshall)

Copepods utilise a huge variety of metazoans as hosts, from sponges to chordates, including fish, reptiles, amphibians and marine mammals. The main families utilising particular invertebrate host phyla will be introduced and their usage of host microhabitats reviewed. The emphasis will be on where to find them, on their adaptations to the parasitic mode of life, and on the characters that are most useful in their identification. Key aspects of the biology of a selection of the most important taxa will also be introduced, although often little is known. Methods of collecting and extracting copepods from their invertebrate hosts will also be summarised.

10) *Symbiotic Copepods Using Marine Fish as Hosts: an Overview* (Tutor: Ju-shey Ho)

Marine fish of both elasmobranchs and actinopterygians are known to host 27 families of copepods comprising about 2,000 species. Participants of this workshop will be introduced to the systematics and morphology of these specialized copepods through a comparison of the various patterns of parasitism and parasitic adaptation. Copepods associated with fish hosts are known to exhibit three patterns of parasitism: ectoparasitism, mesoparasitism and endoparasitism. Adaptation to a parasitic mode of life is also reflected at different levels. Students will be introduced to three of them: morphological adaptation, developmental adaptation and reproductive adaptation.

Cost

The tuition fee is kept to a minimum and will be **50 USD** for the entire course. Students attending the training workshop must pay for their own travel to Chetumal. The cost of this will be variable. We assume that all participants will also be travelling to Mexico for the 11th International Conference on Copepoda in Mérida, commencing on 10th July. Transport from the training course to the conference venue will be arranged on 9th July 2011 and a small charge

may be made (about **30-35 USD**) for a bus trip. Students must also pay for one week's accommodation and meals. Precise costs are not yet available but we estimate that the cost of accommodation plus food will be approximately about **400 USD** for 6 nights/days. More detailed costings will be provided in the next *Monoculus* newsletter. Organizers are requesting support to different agencies to offer partial scholarships to some students in order to cover accommodation or food expenses during the course. Selected students will be notified in due course.

How to Apply

A significant proportion of places will be reserved for trainees from Latin and South American countries but applicants from outside these regions are also encouraged to apply. Applicants are expected to have a reasonable command of the English language. A questionnaire must be completed in order to apply for one of the limited places (20–25) in the course. The questionnaire can be found in the newsletter *Monoculus*, and it will be posted on the Conference website (<http://www.11thcic.com/>) and on the WAC website (<http://www.monoculus.org/>). It can also be obtained direct by emailing Rony Huys (r.huys@nhm.ac.uk).

Students will be selected by the workshop organizer, in consultation with Dr. Eduardo Suárez-Morales and Dr. Janet Reid.

Please send or email your completed questionnaire to Rony Huys at the Natural History Museum, Cromwell Road, London SW7 5BD, U.K. (r.huys@nhm.ac.uk).

**The deadline for receipt of applications is
15th February 2011.
See the application form on page 13.**

Special Offer to Workshop Participants

Each course participant will receive a free copy of the benchmark volume

Kabata, Z. (1979). *Parasitic Copepoda of British Fishes*. The Ray Society, London: xii + 468 pp.

The Ray Society has also agreed to make two other reference works on copepods available to workshop participants at a special concessionary price.

- Huys, R. & G.A. Boxshall (1991). *Copepod Evolution*. The Ray Society, London: 468 pp. Price for workshop participants: **25 USD** (full retail price 90 USD).
- Boxshall, G.A. & S.H. Halsey (2004). *An Introduction to Copepod Diversity*. The Ray Society, London: xv + 966 pp [2 hardback volumes]. Price for workshop participants: **100 USD** (full retail price 240 USD).

Dues for 2010: Is your membership current?

Well, it is the near the end of the year, so this is my last call for dues from the copepod community. These modest amounts help support the WAC and the people who help organize, maintain and provide copepod information to the world via 3 main copepod websites. To date we have 513 names of copepod researchers in the database (<http://www.monoculus.org/en/researchers-search>) of whom 130 have paid their dues for 2010 and further into the future. To check on the status of your dues you can go to this site, login using the login and password I sent to all of you earlier this year, and can then see when and if you paid dues. You can also update any of your information on the site.

Feel free to contact me if you have any problems accessing your information on the website.

Many people freely contribute large amounts of their time to provide information via websites and newsletters to assist the copepod community with their research. We would like to ask you to say “thanks” by joining and/or maintaining your membership with the WAC. And ... if you have extra money lying around, consider becoming a Sponsor or Lifetime Member.

— T. Chad Walter
Treasurer

Would you like to help organize information on copepod taxonomy?

I am sure that most of you have visited the website <http://www.marinespecies.org/copepoda/> and looked up the taxonomy of copepods for your group. A group of editors are currently helping to update the database (Editors: Geoff Boxshall, Chad Walter, Associate Editors: Ruth Böttger-Schnack, Frank D. Ferrari, Ju-shey Ho, Slava Ivanenko, Tomislav Karanovic, Juliana H.M. Kouwenberg, Eduardo Suárez-Morales, and Danny Tang).

We are always looking for specialists to improve the synonymy and update and expand information about specific groups of copepods. Pictures of the species, locality(ies) and other information about copepods can be added, as well as links to pertinent websites on the species.

If you have the time and interest to improve the data for your specific group of copepods, please contact Geoff Boxshall or Chad Walter to join us as an associate editor for copepods.

Currently I am working on a major project. Before his death a couple of months back, Wim Vervoort gave us his Word files that contained his recording of copepods, their hosts, and who cited them for all the groups that copepods

parasitize. Currently, I am parsing out the data to bring it into an Excel file, in order to import it into the WoRMs website. The example below, of a recent upload for echinoderms, shows what it looks like. This information appears under “feeding types”.

(<http://www.marinespecies.org/copepoda/aphia.php?p=taxdetails&id=348832>)

Copepoda taxon details

Anthessius alatus Humes & Stock, 1965
AphiaID: 348832

Classification: Biota > [Animalia](#) > [Arthropoda](#) > [Crustacea](#) > [Maxillopoda](#) > [Copepoda](#) > [Neocopepoda](#) > [Podoplea](#) > [Poecilostomatoida](#) > [Anthessiidae](#) > [Anthessius](#)

Status	accepted
Record status	Checked by Taxonomic Editor
Rank	Species
Parent	Anthessius Della Valle, 1880
Synonymised taxa	Tridacnophilus alatus (Humes & Stock, 1965) (synonym)
Source	basis of record: Walter, Chad. The world of Copepods. [details]
Environment	marine, brackish, fresh, terrestrial
Feeding types	<p><u>adult</u>: parasitic: ectoparasitic on Tridacna noae (Röding, 1798) [details]</p> <p><u>adult</u>: parasitic: ectoparasitic on Acanthaster planci (Linnaeus, 1758) [details]</p> <p><u>adult</u>: parasitic: ectoparasitic on Acanthaster planci (Linnaeus, 1758) [details]</p> <p><u>adult</u>: parasitic: ectoparasitic on Acanthaster planci (Linnaeus, 1758) [details]</p>

Also, as time permits, if editors list all the species that appear in an article, this database will present the information contained the article, as follows.

Copepoda source details

SourceID 119658

Name Walter, T.C.. 1989. Review of the New World

species of *Pseudodiaptomus* (Copepoda: Calanoida), with a key to the species. Bulletin of Marine Science 45(3):590-628, figs. 1-18, tab. 1.

Type Publication

Note The World Of Copepods (T. Chad Walter)

Taxa [Pseudodiaptomus acutus \(Dahl F., 1894\)](#)
(15) (additional source)
[Pseudodiaptomus acutus leptopus Löffler, 1963](#)
(source of synonymy)
[Pseudodiaptomus americanus Wright S., 1937](#)
(source of synonymy)
[Pseudodiaptomus cokeri González & Bowman, 1965](#) (additional source)
[Pseudodiaptomus coronatus Williams, 1906](#)
(source of synonymy)
[Pseudodiaptomus cristobalensis Marsh, 1913](#)
(additional source)
[Pseudodiaptomus culebrensis Marsh, 1913](#)
(additional source)
[Pseudodiaptomus euryhalinus Johnson M.W., 1939](#) (additional source)
[Pseudodiaptomus galapagensis Grice, 1964](#)
(additional source)
[Pseudodiaptomus gracilis \(Dahl F., 1894\)](#)
(additional source)
[Pseudodiaptomus longispinosus Walter, 1989](#)
(original description)
[Pseudodiaptomus marshi Wright S., 1936](#)
(additional source)
[Pseudodiaptomus panamensis Walter, 1989](#)
(original description)
[Pseudodiaptomus pelagicus Herrick, 1884](#)
(additional source)
[Pseudodiaptomus richardi inaequalis Brian, 1926](#) (source of synonymy)

If we can get more editors to help out, we can really make this database into something even more useful than it already is. I hope that we can encourage you to join us in this endeavor.

— T. Chad Walter



New Books and Websites

Correction:

During 2008 and 2009, two Baltic Sea zooplankton books were published by the same team of co-authors - the Atlas and the Extended Atlas; the correct citation is below:

Telesh, I., Postel, L., Heerkloss, R., Mironova, E., Skarlato, S., 2008. Zooplankton of the Open Baltic Sea: Atlas. BMB Publication No. 20 – Meereswiss. Ber. (Marine Science Reports), Warnemünde, 73:1-251.

(electronic version available at:
<http://www.io-warnemuende.de/research/mebe.html>).

Telesh, I., Postel, L., Heerkloss, R., Mironova, E., Skarlato, S., 2009. Zooplankton of the Open Baltic Sea: Extended Atlas. BMB Publication No. 21 – Meereswiss. Ber. (Marine Science Reports), Warnemünde, 76:1-290.

(electronic version available at:
<http://www.io-warnemuende.de/research/mebe.html>).

I and my team of co-authors would be very grateful to you if you could possibly arrange the correct citation of our both recently published books, or please cite just the most recent one but with the appropriate bibliographic data.

Thank you very much in advance.

Sincerely, Irena Telesh

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Life after Death: The Passing of the Torch

After Arthur Humes passed away on October 16, 1999, his entire library and collections were donated to the Smithsonian Institution. The massive amount of material was progressively organized and studied. During a six-month visit in 2006-2007, Viatcheslav N. (Slava) Ivanenko of Moscow State University scanned the Humes logbooks, and organized and cataloged Humes' entire slide collection of about 6000 slides, identified 1800 paratype slides of about 520 species described by Humes, and made permanent archival mounts.

Some time after Arthur's passing, Dr. Il-Hoi Kim of Kangnung National University visited the Department of Invertebrate Zoology. I was showing him around the collections and mentioned that we had received a large collection of unsorted and unstudied samples from Arthur. He asked if he could study the material, and we said certainly!

Over the years, we sent Il-Hoi hundreds of samples containing hundreds of specimens. The result is that Il-Hoi has described 16 new genera and 157 new species of parasitic copepods from the Humes Collection. The following is a list of all the new taxa that he described. We

thank Il-Hoi for taking on the challenge of finishing the study of Arthur's collections and bringing to light all the new genera and species of copepods that would have otherwise remained unknown, sitting on a shelf at the Smithsonian.

— T. Chad Walter

New Genera

1. *Pterioidicola* Kim, 2003
2. *Pachysericola* Kim, 2003
3. *Humescheres* Kim, 2005
4. *Spongicola* Kim, 2005 (preoccupied name; should be renamed)
5. *Exodontomolgus* Kim 2007
6. *Paranchimolgus* Kim, 2007
7. *Molucomes* Kim, 2007
8. *Discanthessius* Kim, 2009
9. *Tubiporicola* Kim, 2009
10. *Hetairosynella* Kim, 2010
11. *Cyclocheres* Kim, 2010
12. *Stenomyzon* Kim, 2010
13. *Cephalocheres* Kim, 2010
14. *Humesinyzon* Kim, 2010
15. *Thermocheres* Kim, 2010
16. *Gascardama* Kim, 2010

New species (Humes collection numbers in parentheses)

1. *Anchimolgus maximus* Kim, 2003 (1535)
2. *Anchimolgus tenuipes* Kim, 2003 (1539)
3. *Anchimolgus tridentatus* Kim, 2003 (1610)
4. *Anchimolgus multidentatus* Kim, 2003 (1662)
5. *Anchimolgus noumensis* Kim, 2003 (1726)
6. *Jamescookina palmata* Kim, 2003 (1610)
7. *Jamescookina exigua* Kim, 2003 (1610)
8. *Odontomolgus exilipes* Kim, 2003 (1669)
9. *Odontomolgus geminus* Kim, 2003 (1669)
10. *Schedomolgus walteri* Kim, 2003 (1578)
11. *Schedomolgus tenuicaudatus* Kim, 2003 (1588)
12. *Schedomolgus dumbensis* Kim, 2003 (1611)
13. *Scyphuliger longicaudatus* Kim, 2003 (1573)
14. *Scyphuliger latus* Kim, 2003 (1649)
15. *Scyphuliger paucisurculus* Kim, 2003 (1649)
16. *Scyphuliger pennatus* Kim, 2003 (1512)
17. *Scyphuliger pilosus* Kim, 2003 (1512)
18. *Pterioidicola antennatus* Kim, 2003 (1707)
19. *Arthurius humesi* Kim, 2003 (n. gen., n. sp.) (1682)
20. *Critomolgus linguifurcus* Kim, 2003 (1562)
21. *Critomolgus mandoensis* Kim, 2003 (1594)
22. *Critomolgus brevifurcatus* Kim, 2003 (1689)
23. *Doridicola parvicaudatus* Kim, 2003 (1682)
24. *Paramolgus galeatus* Kim, 2003 (1657)
25. *Pachysericola compressus* Kim, 2003 (1543)
26. *Asteropontius brevioris* Kim, 2003 (1529)
27. *Asteropontius acroporus* Kim, 2003 (1588)
28. *Asteropontius caledoniensis* Kim, 2003 (1610)
29. *Asteropontius minutus* Kim, 2003 (1528)
30. *Asteropontius dissimilis* Kim, 2003 (1528)
31. *Pseudomacrochiron pocilloporae* Kim, 2004 (2010)
32. *Acontiophorus panamensis* Kim, 2004 (2010)
33. *Asterocheres pilosus* Kim, 2004 (2007)
34. *Asterocheres walteri* Kim, 2004 (2018)
35. *Asterocheres urabensis* Kim, 2004 (2004)
36. *Asterocheres tubiporae* Kim, 2004 (H03-5)
37. *Entomopsyllus stocki* Kim, 2004 (H03-5)
38. *Enalcyonium lobophyti* Kim, 2004 (no number)
39. *Enalcyonium humesi* Kim, 2004 (no number)
40. *Enalcyonium caledonensis* Kim, 2004 (no number)
41. *Enalcyonium auriculatum* Kim, 2004 (no number)
42. *Enalcyonium capillatum* Kim, 2004 (1663R)
43. *Enalcyonium bullatum* Kim, 2004 (1685)
44. *Panjakus bidentis* Kim, 2004 (2065)
45. *Scyphuliger humesi* Kim, 2004 (2045)
46. *Scyphuliger vicinus* Kim, 2004 (2052)
47. *Scyphuliger placidus* Kim, 2004 (2052)
48. *Doridicola parapatulus* Kim, 2004 (H03-8)
49. *Ruhtra germinata* Kim, 2004 (H03-11)
50. *Collocheres oribullatus* Kim, 2004 (2050)
51. *Acanthomolgus longiunguifer* Kim, 2005 (F13)
52. *Acanthomolgus geminus* Kim, 2005 (F18)
53. *Paramolgus incidentus* Kim, 2005 (F18)
54. *Humescheres boholensis* Kim, 2005 (F14)
55. *Spongicola tropicanus* Kim, 2005 (1859)
56. *Asterocheres brevisurculus* Kim, 2005 (1859)
57. *Panjakus fastigatus* Kim, 2005 (1919)
58. *Panjakus parvipes* Kim, 2005 (1919)
59. *Panjakus saccipes* Kim, 2005 (1920)
60. *Panjakus iratus* Kim, 2005 (1920)
61. *Odontomolgus mucosus* Kim, 2006 (2000)
62. *Odontomolgus unioviger* Kim, 2006 (2000)
63. *Sociellus geminus* Kim, 2006 (2000)
64. *Amarda curvus* Kim, 2007 (1925)
65. *Anchimolgus gracilipes* Kim, 2007 (1854)
66. *Anchimolgus partenuipes* Kim, 2007 (1849)
67. *Anchimolgus parangensis* Kim, 2007 (1920)
68. *Anchimolgus hastatus* Kim, 2007 (1807)
69. *Andrianellus papillipes* Kim, 2007 (1919)
70. *Exodontomolgus communis* Kim 2007 (1902)
71. *Jamescookina moluccensis* Kim, 2007 (1896)
72. *Odontomolgus flammeus* Kim, 2007 (1807)
73. *Odontomolgus parvus* Kim, 2007 (1925)
74. *Odontomolgus pavonus* Kim, 2007 (1854)
75. *Paranchimolgus parallelus* Kim, 2007 (1902)
76. *Scyphuliger karamiensis* Kim, 2007 (1883)
77. *Enalcyonium circulatum* Kim, 2007 (1907)
78. *Enalcyonium ceramensis* Kim, 2007 (1928)
79. *Parastericola rimosus* Kim, 2007 (1965)
80. *Pseudanthessius truncus* Kim, 2007 (1876)
81. *Pseudanthessius planus* Kim, 2007 (1876)
82. *Acanthomolgus gomumuensis* Kim, 2007 (1972)

83. *Acanthomolgus dispadactylus* Kim, 2007 (1972)
 84. *Acanthomolgus bandaensis* Kim, 2007 (1758)
 85. *Acanthomolgus ambonensis* Kim, 2007 (1749)
 96. *Kombia avitus* Kim, 2007 (1915)
 87. *Pionomolgus moluccensis* Kim, 2007 (1896)
 88. *Cryptopontius acutus* Kim, 2007 (1860)
 89. *Asteropontius fungicola* Kim, 2007 (1807)
 90. *Asteropontius goniopora* Kim, 2007 (1889)
 91. *Collocheres humesi* Kim, 2007 (1799)
 92. *Collocheres amicus* Kim, 2007 (1799)
 93. *Molucomes ovatus* Kim, 2007 (1951)
 94. *Giardella ricoensis* Kim, 2008 (396)
 95. *Anthessius nosybensis* Kim, 2009 (294)
 96. *Discanthessius solitarius* Kim, 2009 *561)
 97. *Cemihyclops tenuis* Kim, 2009 (6R393)
 98. *Hemicyclops tripartitus* Kim, 2009 (R436)
 99. *Hemicyclops humesi* Kim, 2009 (6R393)
 100. *Hemicyclops magnus* Kim, 2009 (255)
 101. *Leptinogaster minuta* Kim, 2009 (2008R1)
 102. *Schedomolgus crenulatus* Kim, 2009 (521)
 103. *Schedomolgus parvipediger* Kim, 2009 (1045)
 104. *Kelleria multiovigera* Kim, 2009 (R514)
 105. *Lichomolgus angustus* Kim, 2009 (R1051)
 106. *Lichomolgus fusiformis* Kim, 2009 (1294)
 107. *Pseudanthessius acutus* Kim, 2009 (447)
 108. *Pseudanthessius asper* Kim, 2009 (R1125)
 109. *Tubiporicola pediger* Kim, 2009 (3R1032)
 110. *Acanthomolgus tenuispinatus* Kim, 2009 (1169)
 111. *Notoxynus lokobensis* Kim, 2009 (R616)
 112. *Eupolymniphilus occidentalis* Kim, 2009 (447)
 113. *Eupolymniphilus brevicaudatus* Kim, 2009 (3R1032)
 114. *Enalcyonium robustum* Kim, 2009 (1356)
 115. *Enalcyonium grandisetigerum* Kim, 2009 (1358)
 116. *Ostrincola binoviger* Kim, 2009 (201)
 117. *Asterocheres unioviger* Kim, 2010 (253)
 118. *Asterocheres trisetatus* Kim, 2010 (245)
 119. *Asterocheres bahamensis* Kim, 2010 (246)
 120. *Asterocheres tricuspis* Kim, 2010 (333)
 121. *Asterocheres plumosus* Kim, 2010 (253)
 122. *Asterocheres peniculatus* Kim, 2010 (270)
 123. *Asterocheres oricurvus* Kim, 2010 (447)
 124. *Asterocheres planus* Kim, 2010 (906)
 125. *Asterochere sensilis* Kim, 2010 (538)
 126. *Asterocheres indivisus* Kim, 2010 (1211)
 127. *Asterocheres nudicoxus* Kim, 2010 (2R1032)
 128. *Asterocheres tenuipes* Kim, 2010 (R1125)
 129. *Asterocheres galeatus* Kim, 2010 (836)
 130. *Asterocheres fastigatus* Kim, 2010 (324)
 131. *Hetairosynella bifurcata* Kim, 2010 (453)
 132. *Hetairosynella angulata* Kim, 2010 (453)
 133. *Hetairosynella aculeata* Kim, 2010 (253)
 134. *Asteropontius capillatus* Kim, 2010 (447)
 135. *Asteropontius membranulatus* Kim, 2010 (561)
 136. *Asteropontius plumatus* Kim, 2010 (561)
 137. *Asteropontius parvipes* Kim, 2010 (1185)
 138. *Asteropontius humesi* Kim, 2010 (705)

139. *Asteropontius angulatus* Kim, 2010 (1038)
 140. *Asteropontius latioriger* Kim, 2010 (1117)
 141. *Asteropontius magnisetiger* Kim, 2010 (639)
 142. *Asteropontius pinnatus* Kim, 2010 (1044)
 143. *Asteropontius trifilis* Kim, 2010 (732)
 144. *Asteropontius orcafer* Kim, 2010 (734)
 145. *Asteropontius bilinguis* Kim, 2010 (619)
 146. *Asteropontius dentatus* Kim, 2010 (864)
 147. *Asteropontius minutisetiger* Kim, 2010 (926)
 148. *Asteropontius bispinifer* Kim, 2010 (1073)
 149. *Collocherides minutus* Kim, 2010 (600)
 150. *Cyclocheres sensilis* Kim, 2010 (333)
 151. *Stenomyzon edentatum* Kim, 2010 395
 152. *Cephalocheres flagellatus* Kim, 2010 (1038)
 153. *Humesimyzon pusillum* Kim, 2010 (708)
 154. *Thermocheres validus* Kim, 2010 (670)
 155. *Gascardama longisiphonata* Kim, 2010 (717)
 156. *Stenopontius spinulatus* Kim, 2010 (1159)
 157. *Stephopontius ahni* Kim, 2010 (581)

Request for Reprints for the Wilson Copepod Library

Back in September I sent an email request to all of you to go to the Wilson Copepod website and check your references to see if we had a copy. I got a reply from about 15 researches, and got about 50 reprints and pdfs, but am hoping for more, so trying it again this time via hard copy. This was my email request:

I have recently had “The World of Copepods” bibliographic website database redesigned. Now a visitor to the site can see whether or not the Wilson Copepod library has a copy of a paper or a pdf. In an order to make sure a copy of all your publications are in the Wilson library for future use by copepodologists from around the world, I would like to request that you go to the website and check to see if we have a copy, either paper or pdf, of your publications.

Therefore, please go to:

<http://invertebrates.si.edu/copepod/index.htm>

Click on “Bibliography”, type your last name in the author field, and click “submit query”. An alphabetical list of all papers published with that last name will appear. If we have a copy, it will say “Wilson:paper” or “Wilson:PDF” or “Wilson:paper, PDF”, this last indicating that we have a copy in both formats. If you see nothing in the last column, then we do not have a copy, and would like to request that you send me a copy – either paper or pdf – so that we can have a complete set of your publications in the library. Any and all papers that you send will be updated in the public

database, so that other copepod researchers can easily see what is available in the Wilson Copepod Library.

If you have any questions feel free to contact me for help. Thank you in advance for sending us your publications.

— T. Chad Walter
Smithsonian Institution
Museum Support Center, MRC 534
c/o Wilson Copepod Library
4210 Silver Hill Road
Suitland, MD 20746
<http://www.marinespecies.org/copepoda/>
<http://invertebrates.si.edu/copepod/index.htm>

Copepod Hat

This and other designs (including custom ones) are available from Maria Bjork Steinarsdottir at www.etsy.com/shop/MariaBjork



Copepod T-Shirts

Hello all, I bought a couple of copepod t-shirts from this website, so I thought I would pass the url on to the rest of the community. I have been wearing them around, and have received a lot of compliments and questions as to what these are. So, I get to tell the non-copepod people about copepods.

<http://www.zazzle.com/haeckel+tshirts>

— T. Chad Walter



News from or about Members

Eduardo Suárez Morales Receives Conservation Award

As part of Mexico's National Conservation Week, the Ministry of Environment and Natural Resources (SEMARNAT) through the National Commission on Protected Areas (Comisionado Nacional de Áreas Naturales Protegidas, Conanp), recognized prominent conservationists in different disciplines, for 2010, during an event held on the Isla Mujeres off Cancún. In the research category, the "Efraín Hernández Xolocotzi-Guzmán" Recognition for Conservation of Nature or Reconocimiento a la Conservación de la Naturaleza "Efraín Hernández Xolocotzi-Guzmán" was awarded to Eduardo Suárez Morales.

After the event, a procession of boats traveled to the reef area, which officially opened the first room of the new Underwater Museum (Museo Subacuático, MUSA), which brings together 400 sculptures in concrete.

Many congratulations to Eduardo for this well-deserved honor!

New Addresses or E-mails:

Hendrik Gheerardyn

I am not longer working at the Marine Biology research group of Ghent University. However, I am continuing research on harpacticoids in the lab of prof. Wonchoel Lee at Hanyang University (Seoul, Korea).

Below you can find my new contact details. So please only use my new email-address as my urgent-account has been closed already.

With best wishes,
Hendrik

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From Rubens Lopes to Pedro Martínez

Dear Pedro,

I would like to congratulate you and your team for the outstanding accomplishment with the new WAC website. As former webmaster and developer of the first WAC website, it is a great pleasure to witness

such major improvement in our primary communication tool with the community and the general public. Now the website has a much more professional and friendly interface. I also liked the new version of the WAC logo, which is derived from the "zig-zag copepod" drawn as part of the logo for the 7th ICOC in Brazil.

Rubens
Rubens M. Lopes
Instituto Oceanográfico
Universidade de São Paulo, Brazil

Passages

Richard Hamond
26 January 1930 – 22 July 2010

Willem Vervoort
12 June 1917 – 18 August 2010

Memorial articles will appear in the next number of
Monoculus.

Editor's Notes

Thanks to all the contributors for this number: Hendrik Gheerardyn, Rony Huys, Tom Karanovic, and Chad Walter. To Irina Telesh for sending the correct citations for the two Atlases for the Baltic Sea zooplankton. To Maria Steinarsdottir for the photo of her Copepod Hat! Last but not least, very special thanks to Mark Pottek for his cartoon!!

— Jan Reid, Editor
Trumansburg, U.S.A.

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Membership in the WAC: Any person interested in any aspect of the study of Copepoda is eligible for membership in the WAC. Contact the General Secretary for an application form and other information.

Dues: Dues of US \$20.00 per annum are payable by students & researchers from less-developed countries; \$35 for Standard Members; \$200 (or more) for Sponsors; and \$1000 (or more) for Life Members. Members who have difficulty paying dues may apply to the President and the Executive Council for a waiver or reduction. Dues may be paid in advance. Contributions to the WAC are tax-deductible in the U.S.A. WAC accepts personal checks issued in local currencies, made payable to WAC. Checks should be sent by mail to the Treasurer of the WAC. Dues may also be paid in person at WAC conferences. Members who are more than two years in arrears will automatically have their membership terminated.

Newsletter: All members receive the newsletter *MONOCULUS*, which appears at least once a year, in electronic or printed versions.

Copepod Libraries: Monoculus-Library: C/o Prof. Dr. Pedro Martínez Arbizu, Forschungsinstitut Senckenberg, DZMB-Forschungsinstitut Senckenberg, Monoculus-Library, Suedstrand 44, D-26382 Wilhelmshaven, Germany.

C. B. Wilson Library: C/o Mr. T. Chad Walter, Smithsonian Institution, Museum Support Center, MRC 534, 4210 Silver Hill Road, Suitland, MD 20746, U.S.A.

Training Workshop on Morphology and Systematics of Copepods
World Association of Copepodologists – Chetumal, Mexico 2011
Questionnaire for Applicants

Please expand the form as necessary to accommodate your answers – but keep to a maximum of two pages only please.

1. Name:

2. Nationality:

3. Address:

4. Contact details:

Phone:

E-mail:

5. What are your academic qualifications and in which year were they obtained?

6. What is your current position and/or project?

7. What experience do you already have of working with copepods, if any?

8. Why do you wish to attend this course and what do you expect from it? How will it advance your current research?

9. What are the main areas of copepod systematics/biology that interest you?

10. What samples/copepod groups will you bring to the workshop, if any?

Please email or send this form to: Rony Huys (r.huys@nhm.ac.uk), Natural History Museum, Cromwell Road, London SW7 5BD, U.K.

Deadline for receipt of applications: 15th February 2011