



WORLD ASSOCIATION OF  
COPEPODOLGISTS

# MONOCULUS Copepod Newsletter

The Newsletter of the World Association of Copepodologists

Number 64

January 2013

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Planktonnet [planktonnet@yahoogroups.com](mailto:planktonnet@yahoogroups.com)

## 12<sup>th</sup> International Conference on Copepoda, July 2014

Mark your calendars for the conference in Korea in 2014.

<http://envisci.hanyang.ac.kr:8001/12th/>



For further information on the conference, Please contact:

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MERIDA, MEXICO 2011  
**FRESHWATER COPEPODOLOGY  
AWARD**



I feel very honored and excited to receive the Freshwater Copepodology Award granted during the 11th International Conference on Copepoda (ICOC) held in Merida, Mexico. I was very pleased to participate in the ICOC, which gave me the opportunity to know how different and interesting the approaches used to study copepods could be, as well as the chance to meet many copepodologists from all over the world with whom I could exchange my ideas and receive advice and helpful criticism that will surely enrich my work.

My contribution presented was about the research that constituted my MSc dissertation, where I studied the Mexican populations of the freshwater calanoid *Leptodiaptomus cf. sicilis*, inhabiting three neighboring lakes at Oriental Basin, Central Mexico. These lakes are endorheic, with a common history (since the Late Pleistocene) and have a considerable salinity gradient among them; limnological characteristics that make this an ideal scenario to test the hypothesis that salinity and geographical isolation are intimately involved on the process of biological diversification of this zooplankton species. So, the aim of the

study was to determine the effect of these factors on the possible existence of cryptic speciation, genetic divergence, local adaptation or phenotypic plasticity among the three *L. cf. sicilis* populations. We performed a multidisciplinary approach and analyzed: (1) the morphological divergence; (2) the intra and interpopulation genetic divergence by sequencing the COI gene, and (3) the network constructed identifying the different haplotypes; (4) the biological fitness (patterns of hatching, survivorship and development) at different experimental salinities; and (5) the potential gene flow among the three populations. The approaches used allowed us to generate a better idea of the taxonomy, ecology and evolution of these copepods. Considering the morphological, molecular and ecological perspectives, we found different adaptive strategies among *L. cf. sicilis* populations. We concluded that our copepods belong to the same biological species, having a complex process of diversification, with persistent founder events and divergent selection of genotypes related to the habitat, so the geographical isolation, but mainly salinity may represent important ecological barriers that apparently conducted to local adaptation and prevent the natural genetic flow among these copepods, even they still have the potential to interbreed.

I am currently working in my PhD thesis; this research aims to describe the phylogeographic and genetic structure of the populations of different species of copepods (Calanoida and Cyclopoida) distributed in the eight lakes from Oriental Basin. My analysis is based on comparative morphology but mainly molecular biology, comparing several sequences of mitochondrial DNA genes (COI and 16S) and other neutral markers (e. g., microsatellites) which will allow me to solve questions of ecological and evolutionary processes related to colonization, gene flow and patterns of genetic divergence between these species of lake zooplankton. Finally, I want to thank my advisor, Dr. Jorge Ciro-Pérez for the opportunity to work alongside with him and let me learn every day. I also thank my lab mates, the PCMyL, my family and especially my sweet wife for their support during my work.

Omar Alfredo Barrera Moreno  
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*\*Editor's note – I apologize for the late inclusion of this student recipient in the Student Activities section. I apparently accidentally deleted his submission from the last newsletter. AR*

**Second International Workshop on Symbiotic Copepoda (IWOSC),  
June 30 – July 15, 2013  
University of Limpopo, Department of Biodiversity, Mankweng, South Africa**

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**UNIVERSITY OF LIMPOPO**  
**Faculty of Science and Agriculture**



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Susan Dippenaar, Danny Tang, Julianne Kalman Passarelli are organizing the Second International Workshop on Symbiotic Copepoda (IWOSC) to be held from 30 June – 5 July 2013 at the University of Limpopo, Department of Biodiversity, Mankweng, South Africa (for more information about the University of Limpopo, visit <http://www.ul.ac.za>). The University of Limpopo (UL) is situated about 30km from Polokwane in the Limpopo Province. Polokwane has an airport with daily flights between Polokwane and OR Tambo Airport near Johannesburg. Additionally, Polokwane is situated about 200 km from the Phalaborwa Gate of the Kruger National Park.

The workshop is a follow-up of the first IWOSC, held during December 2010 at Cabrillo Marine Aquarium, U.S.A., and still aims to combat the declining number of experts in our field. Thus, we want to train and recruit more young scientists to maintain the scientific legacy of our smaller, but important, group within the global copepod community. This workshop differs from the one offered a week prior to the triennial International Conference on Copepoda (ICOC) by the World Association of Copepodologists (WAC) to selected young scientists, as it is organized independent of WAC (but with their consent) and will exclude the free-living copepod groups. It focuses on symbiotic copepods and includes collecting methods from different host groups, methods of working with and identifying the material, as well as using computer software methods for organizing illustrations into plates. Students will have the opportunity to interact with peers as well as well-known copepodologists such as Prof Ju-Shey Ho and will have the opportunity to bring their own material to the workshop to receive assistance with problems encountered.

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The preliminary workshop program is as follows:

- Sunday 30 June 2013: Arrival, registration and welcome reception dinner at Bolivia Lodge.
- Monday 1 July 2013: Research presentations (oral and poster) and discussion at UL.
- Tuesday 2 July 2013: Introduction to the morphology of symbiotic copepods found on invertebrates. Workshop on copepods associated with marine invertebrates (including examining possible hosts for infection, collection and preservation, dissection of a copepod and using keys to preliminary identify a copepod and curating of collected and dissected material).
- Wednesday 3 July 2013: Introduction to the morphology of symbiotic copepods found on marine vertebrates. Workshop on copepods associated with marine vertebrates (including examining possible hosts for infection, collection and preservation, dissection of a copepod and using keys to preliminary identify a copepod and curating of collected and dissected material).
- Thursday 4 July 2013: Introduction to the morphology of symbiotic copepods and branchiurans found on freshwater fish. Workshop on copepods and branchiurans associated with freshwater fish (including examining possible hosts for infection, collection and preservation, dissection of a copepod/branchiuran and using keys to preliminary identify a copepod/branchiuran and curating of collected and dissected material).
- Friday 5 July 2013: Workshop on methods and techniques used in preparation of manuscripts (e.g. using of different software programmes and preparing line diagrams etc.). Farewell dinner.

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Here is the website for more information  
<http://sancor.nrf.ac.za/2nd-international-workshop-on-symbiotic-copepoda-iwosc/>

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## Marine Planktonic Copepod Website Call for Letters of Support

The website of Diversity and Geographic Distribution of Marine Planktonic Copepods, located at: <http://copepodes.obs-banyuls.fr/en>, is dedicated to the copepodologist community.

This site is very unique in the domain of marine planktonic copepods. It results from more than 45 years of research coordinated by Claude Razouls and a large diversity of collaborations all over the world. It offers to the scientific community a synthesis of informations about :

- **biodiversity,**
- **systematics,**
- **biogeography with a worldwide distribution from 1883 to 2011.**

Very often visited by the worldwide copepodologist community, it serves as a major support for research activities leading to publications, teaching and identification.

This website and its database were initialized and developed by Dr. Claude Razouls. Dr Razouls who is retired since 2002 continues to update the website and the database.

Unfortunately, Claude Razouls is not able to maintain this activity, which means that the website and its associated database are facing a critical step for the long-term access to these tools. If nothing is done right now, the community will lose the benefit of such an important encyclopedic work on copepods.

The ARAGO Laboratory is investigating different solutions to preserve this activity and to perpetuate these tools and requires letters of support from the international community to be able to convince funding agencies to allocate the appropriate resources for this task.

This message is a call for people who use the site and wish to continue to use valid information. We would be very grateful if you could send us letters of support highlighting the interest and the benefit that this site presents for you. These letters should be addressed to : Director of the Laboratoire ARAGO, Avenue du Fontaulé, 66650 Banyuls-sur-mer, France.

Those who would be interested in the development of collaborations should inform us and contact Nicolas Desreumaux by e-mail. We are also ready to develop software components useful to the community as collaborative tools and online identification keys.

Thanks much for your support,

Nicolas Desreumaux  
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## Report on the Training Programme in Crustacean Systematics with Specialization in Cyclopidae (Copepoda), 2012

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Two students were supported by the WAC to attend the training program in crustacean systematics taught by Dr. Maria Holynska (Museum and Institute of Zoology, Polish Academy of Sciences, Warszawa, Poland) as part of the framework of the Distributed European School of Taxonomy ([www.taxonomytraining.eu](http://www.taxonomytraining.eu)). Dr. Rey Donne Papa from the Phillipines received training from April 5 to May 4, 2012. Dr. Gamal Elshabrawy (National Institute of Oceanography and Fisheries, Cairo, Egypt) received his training from September 3 to September 30, 2012 .

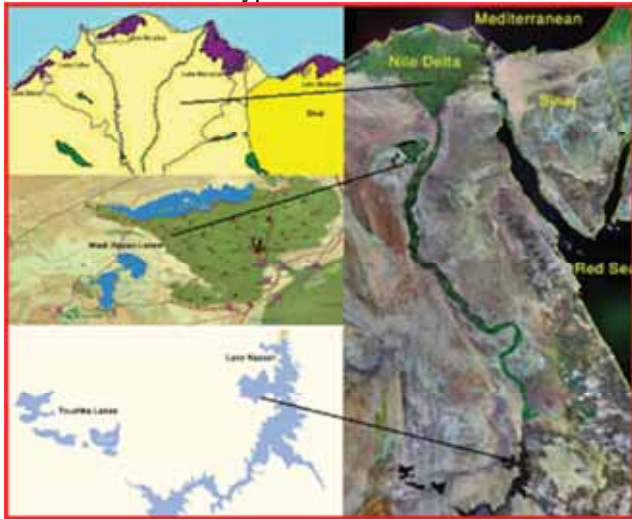


The following is a summary report provided by Dr. Gamal Elshabrawy. The references are provided as an appendix at the end of the newsletter

In Egypt, little attention has been devoted to the taxonomy and ecology of copepods so far. Most studies have focused on marine and brackish waters, and relatively little research has been done on freshwater Copepoda (Barrois 1891; Richard 1893; Ekman 1904; Gurney 1911, 1926; Steuer 1942; Kiefer 1949, 1978; Wawrik 1959; Obuid-Allah et al. 1991a,b,c; Hussein et al. 1991 a,b.) Also, many Egyptian specialists moved to other Arabian countries (Saudi Arabia, Libya), which led to the lack of recent studies on cyclopoid systematics.

From the Nile and its branches, which were the focus of most investigations in Egypt, 21 cyclopoid species have been

reported so far (Table 1). Some of the records, however, are supposed to be misidentifications. This circumstance, and the fact that very little faunistic information is available on waterbodies other than the Nile, urged me to follow the training course offered by dr. Maria Holynska in the framework of the Distributed European School of Taxonomy. I brought several samples to Warsaw, which covered ten different types of the waterbodies:



Lake Nasser, The Nile, Fayum with its two lakes (Qarun and Wadi El-Rayan), and the Nile delta with its Lakes

### 1-The River Nile and its two branches

In Egypt, the Nile river is the lifeline supplying water to tens of millions of people. It flows into the Mediterranean Sea by its two main branches, Damietta and Rosetta.



2-

### 2-Lake Nasser

The construction of the Aswan High Dam in the southern part of Egypt resulted in the creation of one of the largest man-made lakes in the world. The whole reservoir system extends 496 km, of which Lake Nasser and Lake Nubia are 292 km and 204 km long, respectively. The surface area of the Aswan High Dam is 6275 km<sup>2</sup>, of which Lake Nasser occupies 5248 km<sup>2</sup>.

### 3-Wadi el-Rayan lakes

Wadi el-Rayan is a natural depression (703 km<sup>2</sup>), located ca. 90 km southwest of Cairo in the western desert. It is part of the great Saharan biogeographical region. Nowadays, Wadi el-Rayan depression holds two main lakes, at different elevations, connected by a swampy channel.

### 4-Earther fish ponds at El Kanater El Kharia Cairo

They are part of a freshwater fish farm in the National Institute of Oceanography and Fisheries, located ca. 30 km north of Cairo.

Table (1). A list of the cyclopoid species so far reported from the Nile and its branches	Nile at Upper Egypt		Diematta & Rosetta Nile branches
		Nile at Cairo	
<i>Acanthocyclops vernalis</i> (Fischer)			+
<i>Acanthocyclops robustus</i> (Sars)		+	+
<i>Afrocylops gibsoni</i> (Brady)	+	+	+
<i>Apocyclops panamensis</i> (Marsh)			+
<i>Apocyclops dengizicus</i> (Lepeshkin)	+		
<i>Cryptocyclops linjanticus</i> (Kiefer)	+	+	
<i>Cryptocyclops bicolor</i> (Sars)	+		
<i>Ectocyclops phaleratus</i> (Koch)	+		+
<i>Ectocyclops rubescens</i> Brady		+	+
<i>Eucyclops serrulatus</i> (Fischer)	+		
<i>Eucyclops speratus</i> (Lilljeborg)			+
<i>Macrocylops albidus</i> (Jurine)	+		+
<i>Mesocyclops ogunnus</i> Onabamiro	+	+	+
<i>Microcylops varicans</i> (Sars)	+		
<i>Megacyclops viridis</i> (Jurine)		+	+
<i>Paracyclops fimbriatus</i> (Fischer)	+		+
<i>Thermocyclops neglectus</i> (Sars)	+	+	+
<i>Thermocyclops decipiens</i> (Kiefer)	+	+	+
<i>Thermocyclops consimilis</i> (Kiefer)	+	+	
<i>Thermocyclops crassus</i> (Fischer)			+
<i>Tropocyclops confinis</i> (Kiefer)	+		



#### 5- Irrigation canals at El-Sharkia governorate

El Sharkia governorate, 80 km northeast of Cairo, is one of the oldest states in Lower Egypt. It is famous for its agriculture (cotton, corns, fruits and herbs).

#### 6-Small fish ponds at El Zamalek Fish Garden, Cairo

**7-Earthen fish pond at El Fayum near Lake Qarun Fish farms**, located in the southern region of Lake Qarun (a saline lake) in El-Fayoum province. Tilapia and mullets are the dominant fish species.

#### 8- Lake Borullus

Lake Borullus extends along the northern fringe of the Nile Delta. Around the turn of the twentieth century, it had a surface area of about 600 km<sup>2</sup>; but land reclamation for agriculture had caused it to decline to ca. 460 km<sup>2</sup> by 1974, and this decline continues to date. The lake is extremely shallow, with depths between 0.4 and 2.0 m.

#### 9-Lake Manzalah

Lake Manzalah is located on the northeastern edge of the Nile Delta, separated from the Mediterranean Sea by a sandy beach ridge. It is the largest of the delta lakes, with an average depth of 1.3 m.



#### 10- Lake Edku

Lake Edku lies in the north of the Nile Delta, west of Rosetta branch. It is a shallow brackish water basin (126 km<sup>2</sup>) with depths ranging from 60-150 cm.

As a result, we have found 13 cyclopid species (Table 2) from these sites, some of which [e.g. *Eucyclops roseus* Ishida, *Paracyclops chiltoni* (Thomson), and *Mesocyclops aspericornis* (Daday)] are new to Egypt. Other taxa in the genera *Eucyclops*, *Apocyclops* and *Afrocyclus* need further examinations to elucidate their taxonomic position.

I have learned dissecting, using morphological characters in species identification, and making drawings. Also, I got an introduction to managing a reference collection of the Egyptian copepods. During my stay we collected most of the relevant identification keys and taxonomic literature. We do believe that our one month joint work is just the start of a long-term cooperation, and our future investigations will yield exciting data on the taxonomy and zoogeography of Cyclopidae in Egypt, and Africa in general.

I would like to take this opportunity to thank my trainer, Dr. Maria Holynska, for her patient help, and the DEST and WAC for giving me the opportunity to participate in the training course.

Dr Gamal El-Shabrawy

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Fish Research Station, ElKanater ElKharia

Cairo, Egypt

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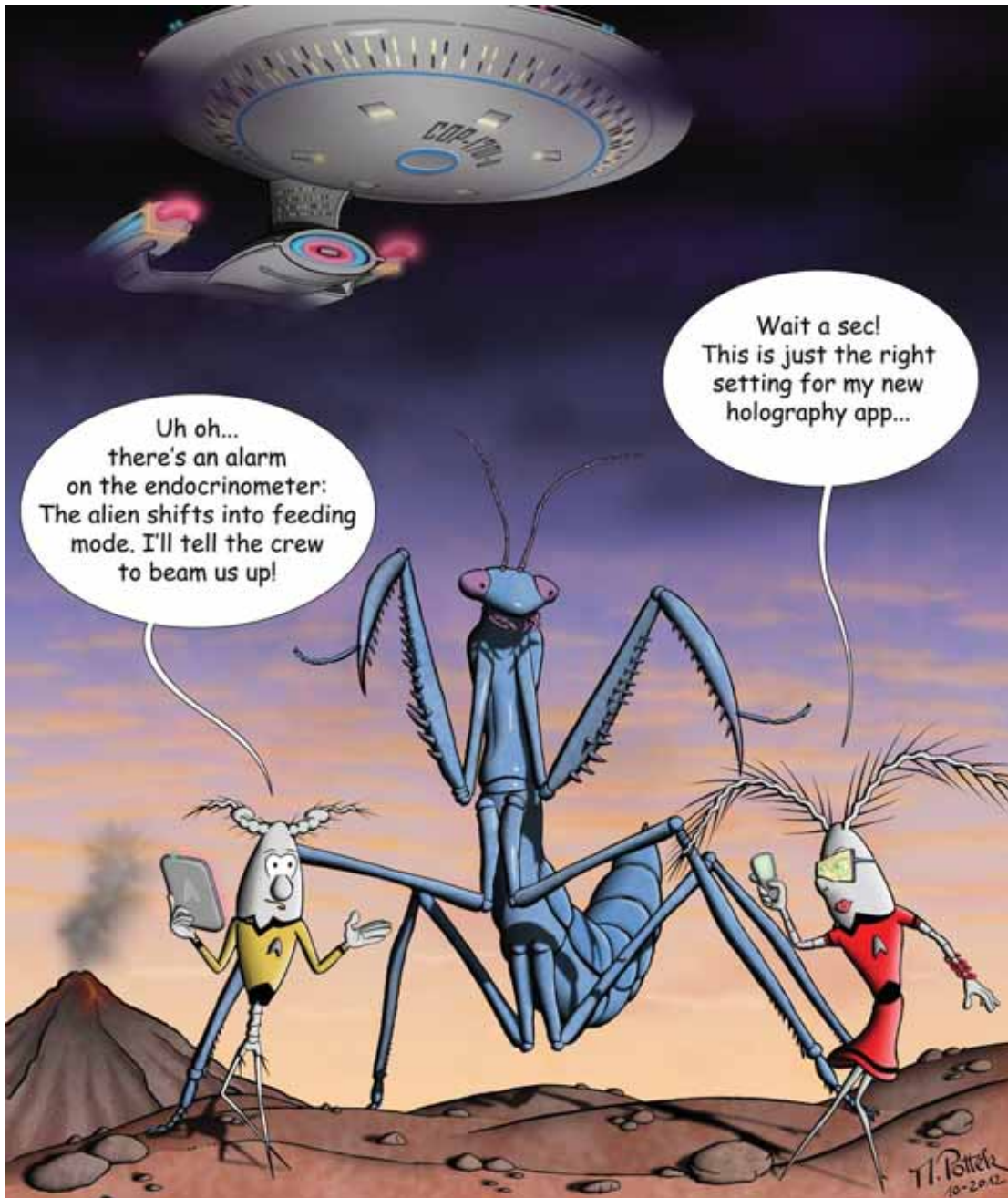
Table 2. List of cyclopid species identified during the training course. Numbers after the name of taxa refer to the localities described above.	Location
<i>Acanthocyclops trajani</i> Mirabdullayev et Defaye	1, 4, 7, 8, 9, 10
<i>Afrocyclus gibsoni</i> (Brady)	1, 5
<i>Apocyclops cf. panamensis</i> (Marsh)	3, 7, 8, 9, 10
<i>Ectocyclops rubescens</i> Brady	1
<i>Eucyclops</i> sp. ( <i>serrulatus</i> group)	1
<i>Eucyclops roseus</i> Ishida	1, 4, 5
<i>Macrocyclops albidus</i> (Jurine)	1, 4, 5
<i>Mesocyclops aspericornis</i> (Daday)	1, 5, 6
<i>Mesocyclops ogunnus</i> Onabamiro	1, 2, 3, 8
<i>Paracyclops chiltoni</i> (Thomson)	1
<i>Thermocyclops decipiens</i> (Kiefer)	1, 5, 6, 7, 8, 9
<i>Thermocyclops neglectus</i> (Sars)	2, 3, 4
<i>Thermocyclops oblongatus</i> (Sars)	5

## Upcoming DEST TRAINING COURSES FOR 2013

<http://www.taxonomytraining.eu/content/modern-taxonomy-course-programme-2012-2013>

Course	Location and Dates	Registration Dates
<b>Basics of taxonomy: describing, illustrating and writing biodiversity</b>	Sven Lovén Centre for Marine Sciences, Kristineberg, Sweden <b>dates TBA soon (Autumn 2013)</b>	<b>open soon</b>
<b>Zoological Nomenclature</b>	Museo Nacional de Ciencias Naturales, Madrid, Spain <b>dates tba soon</b>	<b>open soon</b>

### Copepods in Outer Space by Dr. Mark Pottek

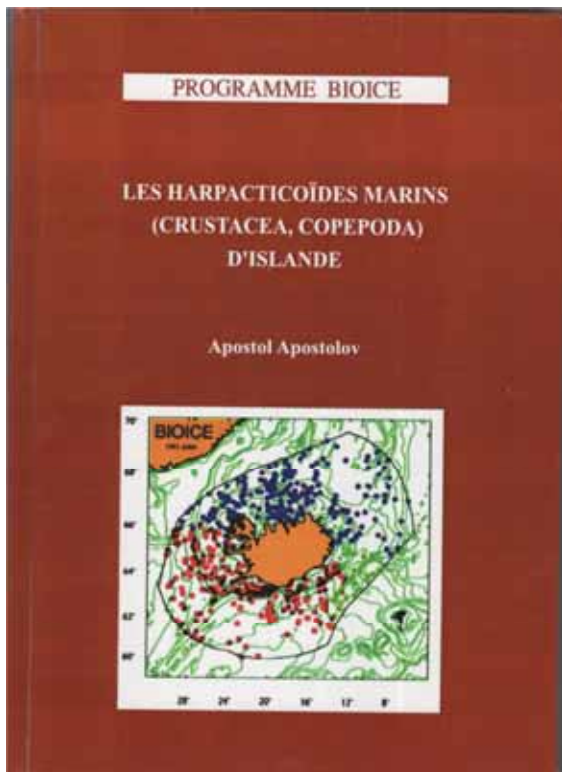


## New Books and Websites

### “LES HARPACTICOIDES MARINS (CRUSTACEA, COPEPODA) D’ICLANDE”

Prof. Dr. Apostol Apostolov  
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Burgas 8000, Bulgaria  
tel/fax +359 56 845 790  
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Burgas, Bulgaria, August, 2012 – Prof. Dr. Apostol Apostolov is proud to announce the release of the only and most comprehensive study on the Iceland’s copepoda fauna titled “Les Harpacticoides Crustacea, Copepoda d’Iclande”. The book meticulously captures eight years’ worth of determining and classifying samples from an area of 758 000 square meters and depths ranging from 20 to 3500 meters between Greenland, Iceland and Faroe Ridge. The book establishes thirty three species part of twenty three genera and eight families. Twenty one species from fifteen genera are found to be new to science including the *Pontobradya* genus. Other seventeen genera are new to the Iceland’s fauna. The book bases its research and outcome on sample materials collected within the BIOICE program.



### Microscopic Worlds Vol. 1: Bugs of the Ocean

Kerry Swanson, University of Canterbury  
3D Color Photographs  
112 pages, 260 x 200 mm  
Publisher: CSIRO Publishing

<http://www.publish.csiro.au/nid/22/pid/6712.htm>

## Newsletter Contributions

Please contribute your news items by contacting the Monoculus editor, Adelaide Rhodes, at [Adelaide.Rhodes@tamucc.edu](mailto:Adelaide.Rhodes@tamucc.edu)

## Passages

### William Vervoort (1917-2010)

Willem Vervoort passed away August 18, 2010 in Leiden. Willem was born June 12, 1917 and obtained his Ph.D. at Leiden University, publishing a dissertation on the Copepoda of the Snellius Expedition (Indonesia). He spent more than forty years (1941-1982) at the Rijksmuseum van Natuurlijke Historie (Leiden), which is now the National Natuurhistorisch Museum. He rose to the directorship and was also a Chair of Systematic Zoology at Leiden University during his tenure.

He introduced 70 taxa of Copepoda (i.e. 1 family, 1 subfamily, 11 genera and 57 species) in addition to 199 Hydrozoan taxa. Two volumes with scientific essays were produced in his honor (Van Bruggen & Wiebes, eds, 1982, 143 pp.; Den Hartog, Van Bruggen, Cornelius and Van Ofwegen, eds., 1998, 460 pp.) 170 publications encompassing 9609 pages were produced by Vervoort and his co-authors, so we will not publish the complete compilation here. His wide ranging contributions to a variety of taxa is evidenced by the large amount of eponymous taxa: 16 copepod species, 15 cnidarian species, 2 anthozoan species, 1 poriferan species, 2 insect species, 2 arachnid species, 1 insect genus and 1 anthozoan genus.

#### Crustacea Copepoda (16 eponymous species)

*Collocheres vervoorti* Humes, 1998  
*Cotylemyzon vervoorti* Stock, 1982  
*Dactylopodella vervoorti* Moore, 1976  
*Ectinosoma vervoorti* Soyer, 1972  
*Enhydrosoma vervoorti* Fiers, 1987  
*Epicalymma vervoorti* Heron, English & Damkaer, 1984  
*Esola vervoorti* Huys & Lee, 2000  
*Euchaeta vervoorti* Park, 1978  
*Holobomolochus vervoorti* Cressey, 1983  
*Macrochiron vervoorti* Humes & de Maria, 1969  
*Notobomolochus vervoorti* Avdeev, 1986  
*Patagoniaella vervoorti* Pallares, 1968  
*Pontella vervoorti* Mulyadi, 2003  
*Pseudochirella vervoorti* Tanaka & Omori, 1969  
*Scaphocalanus vervoorti* Park, 1982  
*Scolecithricella vervoorti* Park, 1980

More details on Wm Vervoort’s accomplishments, eponyms and publications can be found in Bruggen, A.C. van. Willem Vervoort (1917-2010), copepodologist, Hydrozoa specialist and museum director, an obituary. Zool. Med. Leiden 85 (14), 30.xi.2011: 865-875, figs 1-2.— ISSN 0024-0672.

<http://dpc.uba.uva.nl/cgi/t/text/get-pdf?c=zoomed;idno=8504a14>



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Jiang-Shiou Hwang  
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Janet W. Reid  
Shin-ichi Uye  
T. Chad Walter  
Janet Bradford-Grieve  
Cheon-Young Chang

### Editor's Notes

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[2013 WAC Membership Fees are Due](#)

[Please send reprints of your articles to the Monoculus and Wislon Libraries](#)

Looking for a paper? Search the [Bibliography Website](#)

Thanks are owed to Janet Reid, Rony Huys, Hans Dahms, Mark Pottek and all the other contributors to this edition of the Monoculus. Dagmar Frisch was especially helpful in facilitating the last student award recipients' essay. Viola and Torsten from Pedro Martínez's lab support the Monoculus blog on the monoculus.org website.

I hope to keep improving on the content of the newsletter and the blog, so feel free to submit any news, pictures, journal articles, etc., that you feel may be of interest to the World Association of Copepodologists. Active research reports with interesting pictures would be much appreciated. Personal notes and accomplishments of note are also welcome. Please email them to:

[Adelaide.Rhodes@tamucc.edu](mailto:Adelaide.Rhodes@tamucc.edu).

— Adelaide Rhodes, Editor

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## Appendix I : List of References from Dr. Gamal Elshabrawy's Report on the Training Program in Crustacean Systematics

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