



**MERIDA, MEXICO 2011**

**JULY 10-15, 2011**

**Organized by**

**El Colegio de la Frontera Sur  
(ECOSUR), MEXICO**



**World Association of  
Copepodologists  
(WAC)**



**CONFERENCE PROGRAM**

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# Message from the President of the World Association of Copepodologists

As President of the World Association of Copepodologists I welcome you to the 11<sup>th</sup> International Conference on Copepoda here in Mérida, Mexico. I am glad to see that so many have managed to get here from the farthest parts of the globe. It is also pleasing to know there are so many young people here planning to carry the torch for copepodology.

I congratulate Eduardo Suárez-Morales and his team in Mexico, assisted by the International Organizing Committee, for bring us all together in Mexico. I hope you all get a chance to appreciate the special history of the landscape and the Mayan people of the Yucatan Peninsula.

Janet Bradford-Grieve  
*President*



# Welcome message from Chairperson of the 11<sup>th</sup> International Conference on Copepoda

Dear colleagues and friends,

On behalf of the International and the Local Organizing Committees it is an honor to welcome you to the 11th Conference in Mexico. After many years, the Conference is back in the Americas and for the first time we have it in Latin America. Also, this is a very special occasion for our association because we are now celebrating its XXV Anniversary; the WAC was created officially in 1986 as a result of the sustained efforts and interest of distinguished copepodologists.

Mérida, in the Yucatan Peninsula, was selected as the official venue to receive this copepodological summit; you will find it to be a friendly city with colonial and modern features and an intense and vivid cultural life. We are sure that you will enjoy it and also its very interesting surroundings, rich in biodiversity, tradition, and archaeology. We selected various appealing and regionally relevant topics that became the symposia that are now part of the program, which also includes the usual oral and poster presentations. The official hotel (Hyatt Regency Mérida) is providing an adequate, functional facility to ensure the best conditions for a satisfactory, fulfilling conference.

We had the institutional and governmental support from El Colegio de la Frontera Sur (ECOSUR), the Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (CONABIO), and the Secretaría de Educación Pública (SEP). We also received generous support from the WAC and from other institutions and sponsors that are listed in the conference program and also in the 11thICOC website. Their help and confidence is deeply appreciated.

The Local Organizing Committee has planned and programmed the scientific and social activities during the Conference; however, if you need assistance or orientation from us, please do not hesitate in asking, we will be glad to help. The Mayan world opens its doors to receive all of us in this Conference. We will share our time, findings, and experiences amidst an environment charged with centuries of history and study of Nature; I'm sure that this copepodological summit will honor this regional tradition.

Eduardo Suárez-Morales  
*Chairperson, Organizing Committee of the 11th ICOC*



# Institutional Sponsors

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## *Executive Council of the WAC* 2008-2011

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# ORGANIZING COMMITTEES OF THE 11<sup>th</sup> ICOC

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## **International Organizing Committee**

**Dr. Geoffrey A. Boxshall, Natural History Museum, London, UK**

**Dr. Ju-shey Ho, State University of California, Long Beach, USA**

**Dr. Rony Huys, Natural History Museum, London, UK**

**Dr. Mark D. Ohman, Scripps Institution of Oceanography, San Diego, USA**

**Dr. Jiang-Shiou Hwang, National Taiwan Ocean University, Keelung, Taiwan**

**Dr. Janet W. Reid, Virginia Museum of Natural History, Martinsville, USA**

**Dr. Grace Wyngaard, James Madison University, USA**

**Dr. Anton Brancelj, National Institute of Biology, Ljubljana, Slovenia**

**Dr. Shin-ichi Uye, Hiroshima University, Japan**

## **Local Organizing Committee**

**Dr. Eduardo Suárez-Morales, El Colegio de la Frontera Sur, Chetumal, Mexico  
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**Dr. Uriel Ordóñez López, CINVESTAV-Mérida, Mérida, Mexico**

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**M. en C. Nancy Mercado-Salas, El Colegio de la Frontera Sur, Chetumal, Mexico**

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**Rosa Ma. Hernández-Flores**

**Magdalena Hernández Chávez**

**Carmen O. Rosas Correa**

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**Janneth Padilla Saldívar**

**Carolina Sosa Vásquez**

**Francisco Rodríguez Pantoja**

**Roger Pech Ramírez**





# GENERAL INFORMATION OF THE CONFERENCE

## Conference Venue and Dates

The 11<sup>th</sup> International Conference on Copepoda will be held in the Hyatt Regency Hotel, Merida, Mexico during the summer, 10-15 July 2011. We are enclosing some useful touristic information (marked maps of Mérida and adjacent areas) so you can move around during your visit to the Yucatan.

## Official Language

English has been the official language of all previous Copepoda Conferences and the 11<sup>th</sup> ICOC will not be an exception.

All participants are encouraged to wear the ID badge that will be provided by the Organizing Committee. Your badge will allow participants to access the meeting rooms and all other events during the Conference. Badges are color-coded as follows:

**Local and International Organizing Committees - RED**

**Local Staff: YELLOW**

**Participants and Accompanying Persons–BLUE.**

All the local staff personnel will also wear a yellow or white polo shirt with a distinctive logo of the 11th ICOC. All of them are English-speaking and have the responsibility to provide you with information and help when necessary.

## Climate

Merida will be very warm and mildly humid during the summer, average temperature will be over 29°C with maximum levels over 33°C.

Light casual clothing is recommended. The hotel and most other places visited (and the buses as well) during the Conference will have Air-conditioning.

## Currency

The Mexican peso is the official currency in the country. Although it has been slightly variable recently, one US dollar is equivalent to approximately 11.60 PESOS. One Euro is currently equivalent to approximately 17.30 PESOS. Notes are in denominations of 1000, 500, 100, 50 and 20 PESOS, each of them in distinctive colours. Pesos coins are in denominations of 10, 5, 1, 0.50, 0.20, and 0.10 (fractionary pesos are cents –centavos–). Most credit cards (AMEX, MC, VISA) are accepted in hotels, restaurants, and shops. Traveler's checks may be cashed by patrons of most tourist hotels but are not commonly accepted by shops or restaurants. It is recommended that you change your money at any Mexican bank or upon arrival at the Mérida International Airport.

## **Electricity**

Electricity in Mexico is 127 volts, 50 cycles with standard fittings.

## **Breakfast/ Lunch/ Dinner/ Coffee Break**

Lunch, dinner, and two coffee breaks (one in the morning and one in the afternoon) are also provided by the conference organizers. Lunch and dinner coupons will be provided upon arrival as part of the registration kit.

## **Transportation from and to the Airport**

The international airport of Merida is conveniently located 15 km from the city, this is a commute of about 20-25 minutes to reach the Conference hotel. The Organizing Committee has arranged mini-buses or vans to transport the participants and accompanying persons to the Conference hotel. This service will be available on Saturday 9 July 2011 and Sunday 10 July 2011. Staff personnel will meet you at the airport exits; they will carry a sign with the official logo and will wear yellow or white polo shirts with the Conference logo. Some participants may reach Mérida by flying to Cancun and then take a 3-4 hour bus trip, the cost of this bus is about 30 USD.

Participants planning an early arrival (before July 9, 2011) can get an airport taxi from Mérida airport to the Conference hotel or downtown Mérida for about 200-300 PESOS. For more information please contact the conference organizer. During the conference we will provide a local bus service to transport participants that are staying at the other hotels related to the Conference; this service will have a defined route so participants will have to walk 1-2 blocks to catch this bus.

## **Conference Secretariat and Internet Room**

We will have a Secretariat Conference room a few steps from session rooms that will handle all administrative and computer services needed during the Conference. An Internet Room will also be available but it is expected that rooms at the venue hotel will have internet connection. Wireless internet will also be available during the event; the password to access this service is "11thICOC".

# SCIENTIFIC PRESENTATIONS

## Oral Presentations

During the regular oral sessions, each speaker will have 15 minutes to present the contribution plus 5 minutes for questions and discussion. Invited speakers for symposia will have presentations of 30-40 minutes and 5-10 minutes for additional discussion.

All speakers are encouraged to check and confirm with the organizing committee the schedule and room of their respective sessions to avoid delays. Speakers should contact the chairperson of the corresponding session in advance to have the presentation material (i.e. *Power Point*) prepared for projection. It is expected that the *Power Point* (or similar) files format of the presentations will be submitted (in a CD-ROM or USB memory) to the organizing committee the day before the session so the file can be checked for functionality and for potential virus infections in it.

Each conference room will be equipped with a large screen (2.8x3.8 m) 3000 lumens video-projector connected to a PC with MS Office (compatible with all versions), overhead projector, wireless microphones (one for the speaker, one for questions from the audience), and a laser pointer.

All speakers are required to strictly adhere to their time schedule. Moderators (designated chairpersons of each session) will make sure that sessions progress according to the planned time table.

## Poster Presentations

Posters will be presented at the foyer area between the two Conference Rooms 1 and 2. The requested format of posters is: 90 cm (width) x 110-120 cm (height). An adequate, numbered board will be provided to all poster presenters; a key number will be provided as well. Participants should put their posters on display and remove them at the end of the 2-days poster session. The local committee will provide help and the items needed for mounting the posters. Poster sessions will take place during lunch time every day of the Conference except on Wednesday (mid-conference tour).

**THE ACADEMIC PROGRAM OF THE 11<sup>th</sup> ICOC INCLUDES ALSO THE PRE-CONFERENCE WORKSHOP ON MORPHOLOGY AND SYSTEMATICS OF COPEPODA, AND THE DEVELOPMENT OF SEVERAL SYMPOSIA.**

# **PRE-CONFERENCE WORKSHOP ON MORPHOLOGY AND SYSTEMATICS OF COPEPODA**



## **PRE-CONFERENCE WORKSHOP ON MORPHOLOGY AND SYSTEMATICS OF COPEPODA**

**(July 4–8, 2011)**

**Venue:**

**El Colegio de la Frontera Sur- Unidad Chetumal  
Chetumal, Quintana Roo, Mexico**

## **WORKSHOP ORGANIZER**

**Rony Huys (Natural History Museum, UK)**

## **CO-ORGANIZERS**

**Eduardo Suárez-Morales (ECOSUR, MEXICO)**

**Janet W. Reid (Virginia Museum of Natural History, USA)**

## **SPONSORS**

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## **LOCAL STAFF**

**Iván A. Castellanos Osorio**

**Rosa Ma. Hernández Flores**

**Rebeca Gasca**

**Nancy Mercado-Salas**

**Adrián Cervantes Martínez**

**Martha A. Gutiérrez-Aguirre**

**Francisco Rodríguez Pantoja**

# PROGRAM OF WORKSHOP

## 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 a 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-hour lectures interspersed with practical sessions.

## Course Content

### **1) *Introduction to Copepod Morphology*** **(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. It will also give an overview of the basic functional morphology of the reproductive, locomotory and feeding systems and document the various sensory

structures in the group. A brief synopsis of the current classification system will be presented.

## **2) *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.

## **3) *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.

## **4) *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 Oncaeidae, 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, focusing 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 will be discussed and the advantage of combining both methods be explained.

### **5) *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.

### **6) *Freshwater Benthic Copepods: Introduction to Morphology, Systematics and Biology*** **(Tutor: Janet W. 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.

### **7) *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 workshop in Chetumal, Mexico, 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.

### **8) *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 summarized.

### **9) *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 reflected at different levels. Students will be introduced to three of them: morphological adaptation, developmental adaptation and reproductive adaptation.

### **10) *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.

The deadline for receipt of applications was **31st January 2011**

Number of Students accepted: **24**

Countries represented as:

STUDENTS: Mexico: **5**, Brazil: **4**, Costa Rica: **2**, Cuba: **1**, India: **2**, South Africa: **1**, Namibia: **1**, United States: **2**, Korea: **2**, Russia: **1**, Syria: **1**; Malaysia: **1**, Iraq: **1**.

# Symposia of the 11th ICOC

## Symposium I

### Biogeography and systematics of subterranean copepods

Organizers:

**Geoff Boxshall (Natural History Museum, U.K.)**

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

More than 1000 species of groundwater Copepoda are known world-wide and they inhabit both porous as well as karstic environments. Most of these stygobitic copepods are freshwater, belonging particularly to the orders Cyclopoida and Harpacticoida, but with some representatives from the Calanoida and Gelyelloida. Two exclusively marine orders, Platycopioida and Misophrioida, also include stygobionts. Stygobitic copepods have been discovered on all continents and adjacent marine habitats, except Antarctica, and they occupy a wide array of habitats, from porous aquifers to karstic caves. Most are restricted to specific habitats and many are endemics. Both groups of copepods, from porous and karstic aquifers, exhibit specific adaptations to subterranean conditions – the complete lack of light, scarcity of food and relatively low oscillations in temperature. The most obvious morphological adaptations to subterranean habitats are de-pigmentation, elongation of appendages, increase of egg-volumes combined with decrease of egg number and, especially in copepods, reduction of segmentation of antennules and swimming legs.

There has been increasing interest in subterranean Copepoda in the past two decades: in the discovery of new species, in elucidating biodiversity and biogeographic patterns, in exploring evolutionary history, and in studying of their role in groundwater ecosystems. In some ecosystems, especially ecotones such as the hyporheic zone in rivers and the epikarst in karstic environment, stygobitic copepods play a vital role in water quality determination as they are a dominant group there. Only a small fraction of subterranean habitats around the world have been studied and many groundwater sources are under stress through over-extraction of water for human activities. A symposium reviewing the field is timely.

## Symposium II

### Molecules vs Morphology: why can't they be friends?

Organizers:

**Rony Huys (Natural History Museum, U.K.)**

**Wonchoel Lee (Hanyang University, Korea)**

No group of plants or animals on Earth exhibits the range of morphological diversity as seen among the extant Crustacea. This structural disparity is best demonstrated by the Copepoda, which by virtue of their immense vertical distribution – from the abyss to the high Himalayas, spanning three quarters of the possible global vertical range – outnumber every other multicellular animal group on Earth. They underpin the world's freshwater and marine ecosystems, are sensitive bio-indicators of local and global climate change, key ecosystem service providers, and parasites of economically important aquatic animals. As a group, they exhibit an unusually diverse range of body forms, live in

every conceivable environment (except aerial), and display a wide variety of life history modes, as predators, herbivores and parasites, such that the provision of a robust phylogenetic backbone can inform an exceptionally wide range of research questions and issues of wider interest. Unfortunately, phylogenetic relationships among the ten copepod orders remain largely elusive and among the speciose and morphologically diverse symbiotic orders only a few interrelationships at family level are supported with any degree of certainty. Without recourse to molecular sequence data many of the outstanding contentious issues will remain unresolved. However, despite their central importance, there are currently relatively few publicly available sequences and no large-scale genomic resources for copepods, rendering them the most molecularly undersampled clade – despite being the most abundant one – in the Pancrustacea. An integrated phylogenetic backbone is needed before we can look in detail at speciation, patterns of host utilization and host switching, identify potential key innovations, and test the usefulness of larval characters in placing highly modified parasites in an existing taxonomic framework. Integration of molecular sequence data and morphology is the only way forward to unravel relationships at species and higher taxonomic levels. This symposium will address different issues demonstrating the usefulness of molecular data in solving pivotal questions at species, genus, family and ordinal level but will also expose conflict and consensus in certain lineages.

## **Symposium III**

### **Special symposium on Parasitic Copepoda**

#### **Organizers:**

**Rony Huys (Natural History Museum, U.K.)**

**Masahiro Dojiri (Environmental Monitoring Division City of Los Angeles, U.S.A.)**

**Julianne Kalman Passarelli (Cabrillo Marine Aquarium, California, U.S.A.)**

**Danny Tang (Hiroshima University, Japan)**

With more than 12,500 species, and outnumbering the insects by up to three orders of magnitude, copepods carry a global biological importance that is belied by their generally small size. Their current position of world predominance can be attributed to two principal, recurrent, radiation events, i.e. their major habitat shift into the marine plankton, and the evolution of parasitism. Given their moderately high host specificity in conjunction with the dazzling spectrum of potential marine hosts, it is highly conceivable that symbiotic copepods significantly outnumber their free-living counterparts in species diversity. It would not be extravagant to assume that every other kind of marine macroinvertebrates on Earth has at least one copepod species acting as its own personalized parasite. This successful colonization or utilization of virtually every metazoan phylum has generated a great diversity in copepod body morphology, which is arguably unparalleled among the Crustacea.

Nearly half of all known copepod species live in association with other organisms from almost every aquatic animal phylum including mammals and reptiles. A crude estimate based on morphology suggests that there have been 11 or more independent origins for symbiosis across the various orders with a minimum of 7 independent colonisation events in fish. Copepod symbionts display the highest taxonomic range of associates and hosts of any extant metazoan group and are also notable for the multiple independent appearances of parasitism within particular orders. This symposium will focus on some of the recent developments and discoveries in the taxonomy and

phylogeny of symbiotic copepods and will show that research in this field is gaining momentum, largely due to the efforts of a new generation of researchers building on the legacy and inspiration left by their mentor(s).

## **Symposium IV**

### **Large scale changes on marine Copepoda**

**Organizer:**

**Sergio Hernández-Trujillo (CICIMAR-IPN, Mexico)**

This symposium includes works that:

1. Link physical changes and other factors to different time scales in reference to coastal and oceanic copepod population dynamics.
2. Explore approximations to the treatment of the relationship between the ocean variability (NAO, PDO, ENSO, etc.) and that of the copepod abundance and composition.
3. Analyze changes of distributional patterns, zoogeographic boundaries, phenology and physically-driven processes that involve changes of top-down and/or bottom-to-top processes.
4. Describe the zooplankton (copepod) response to inter-annual and decadal-scales oceanic variability.

# GENERAL PROGRAM AT A GLANCE

Date/Time	Sunday July 10	Monday July 11	Tuesday July 12	Wednesday July 13	Thursday July 14	Friday July 15
8:30-9:00	ARRIVAL OF PARTICIPANTS	Opening Ceremony		CONFERENCE TOUR		
9:00-10:20		Session I – RI  Session I-RII	Symposium II-RI (Molecules vs. Morphology)		Session III-RI	Symposium IV (Large-scale changes of marine Copepoda)
10:20-10:40		Coffee Break Symposium I-RI (Cave Copepods)	Coffee Break		Coffee Break	Coffee Break
10:40-12:20		Session II-RII	Symposium II-RI (Molecules vs. Morphology)		Session IV-RI	Session VII-RI
12:20-14:00	REGISTRATION	LUNCH+Poster I	LUNCH+Poster I	Free time (16:00-17:30). 17:30 Walk to Maxilliped Lecture at Quinta Montes Molina	LUNCH+Poster II	LUNCH+Poster II
14:00-15:40		Symposium I (Cave Copepods)  Session III-RII	Symposium III- RI (Parasitic and Symbiotic Copepoda)		Session V- RI	Session VIII-RI
15:40-16:00		Coffee Break	Coffee Break		Coffee Break	Coffee Break
16:00-17:20		Session II- RI  Session IV-R II	Symposium III-RI (Parasitic and Symbiotic Copepoda)		Session VI- RI	WAC Assembly 16:00-18:00
18:00-20:30	REGISTRATION + WELCOME COCKTAIL	Free Evening/ General Dinner	Free Evening/ General Dinner	Conference Banquet (18:40)	Free Evening/ General Dinner	Farewell Banquet

# Scientific Program

**Monday, July 11**

## PLENARY OPENING SESSION REGENCY ROOM

08:30

### **Opening Ceremony**

#### **Welcome Message**

Chairperson of the Local Organizing Committee:

***Eduardo Suárez-Morales***

#### **Message from the World Association of Copepodologists**

President of the WAC

***Janet Bradford-Grieve***

#### **Opening Speech**

Director of the National Council for Science and Technology (CONACYT)

***Dr. Enrique Villa Rivera***

## CONFERENCE ROOM I

### **Oral Session I–RI: Marine Planktonic Copepoda I**

**Chairperson: Janet Bradford-Grieve (NIWA, New Zealand)**

9:20

Böttger-Schnack, R. & D. Schnack

**Identification key for species groups of the pelagic copepod family Oncaeidae in the World Ocean**

9:40

Cornils, A., S.B. Schnack-Shiel & C. Held

**The phylogeography of *Paracalanus parvus* s.l. (Claus 1863) based on morphology and molecular data**

10:00

Díaz, X.F.G., L.M.O. Gusmão, R. Schwamborn, M.C. Araujo Filho & S. Neumann-Leitão

**Marine zooplankton assemblages during simulated natural gas blowouts**

10:20 – 10:40

**Coffee Break**

## **Symposium I: Biogeography and systematics of subterranean copepods I**

**Chairperson: Geoff Boxshall** (The Natural History Museum, London, UK)

- 10:40      Iliffe, T.M.  
              **Habitats of anchialine copepods**
- 11:20      Boxshall, G.A.  
              **Copepods and anchialine caves: a review**
- 12:00      Galassi, D.M.P., F. Stoch & A. Brancelj  
              **Dissecting copepod diversity at different spatial scales in Southern European ground water**

12:40-14:00    **LUNCH AND POSTER SESSION I**

## **Symposium I: Biogeography and systematics of subterranean copepods II**

**Chairperson: Anton Brancelj** (National Institute of Biology, Ljubljana, Slovenia)

- 14:00      Brancelj, A.  
              **Copepoda from freshwater caves with special emphasis on epikarst**
- 14:40      Stoch, F. & A. Brancelj  
              **Distributional patterns of groundwater copepods in the unsaturated karst of Slovenia and northeastern Italy**
- 15:00      Karanovic, T. & S.J.B. Cooper  
              **Explosive radiation and size differentiation of harpacticoids in a small subterranean island in Western Australia**
- 15:40 – 16:00    **Coffee Break**

## **Oral Session II-RI: Marine Planktonic Copepoda II**

**Chairperson: Jiang-Shiou Hwang** (National Taiwan Ocean University, Taiwan)

- 16:00      Hwang, J.-S., S. Souissi, Li-Chun Tseng, J. C. Molinero, Qing-Chao Chen & Chong Kim Wong  
              **Effects of NE monsoon on the distribution of *Calanus sinicus* in the waters of Taiwan, western North Pacific Ocean**

- 16:20 McKinnon, A. D., R. Böttger-Schnack & S. Duggan  
**Depth structuring of pelagic copepod biodiversity in waters adjacent to an Eastern Indian Ocean coral reef**
- 16:40 Mantha, G., A. Kant Awasthi & J.-S. Hwang  
**Diversity and abnormalities of cyclopoid copepods around hydrothermal vent fluids, Kueishantao Island, Taiwan**
- 17:00 Hernández-Trujillo, S., G.M. Esqueda-Escárcega & J. Hernández-Alfonso  
**Egg production rate of *Acartia lilljeborgii* Giesbrecht, 1889, *Labidocera johnsoni* Fleminger, 1964, and *Centropages furcatus* (Dana, 1849) in a Mexican subtropical lagoon**

## CONFERENCE ROOM II

### Oral Session I–RII: Experimental and Morphological Studies

**Chairperson: Grace A. Wyngaard** (James Madison University, Harrisonburg, USA)

- 9:20 Andrew, D.R., S. Brown & N.J. Strausfeld  
**Comparative neuroanatomical characterization of the harpacticoid copepod *Tigriopus californicus***
- 9:40 Camus, T., C. Zeng & A.D. McKinnon  
**Cannibalism on naupliar stages by adult *Acartia sinjiensis*, a tropical calanoid copepod**
- 10:00 Santhanam, P., K. Jothiraj & N. Jeyaraj  
**Biology, culture and live feed efficacy of copepod *Nannocalanus minor* over *Brachionus plicatilis* and *Artemia nauplii***
- 10:20-10:40 **Coffee Break**

### Oral Session II–RII: Genetic and Molecular Studies

**Chairperson: S.S.S. Sarma** (Universidad Nacional Autónoma de México-Iztacala, Mexico)

- 10:40 Beltrán-Castro, R. & S. Hernández-Trujillo  
**Advances on DNA barcoding as a tool for pelagic copepods identification in the Gulf of California, Mexico**
- 11:05 Elías-Gutiérrez, M. & A. Martínez-Arce  
**The value of DNA barcoding of freshwater Copepoda: highlights and cryptic species**



- 11:30      Saitoh, S. & H.B. Tamate  
**Population genetic analysis of the small subtropical planktonic copepods in marine lakes of Palau**
- 11:55      Skern-Mauritzen, R., K. Malde, I. Jonassen, R. Reinhardt, B. Koop & F. Nilsen  
**Sequencing the salmon louse genome – lessons learned and current status**

12:20-14:00      **LUNCH AND POSTER SESSION I**

## **Oral Session III–RII: Harpacticoida and Meiobenthos**

**Chair person: Rony Huys** (Natural History Museum, London, UK)

- 14:00      Chertoprud, E.S.  
**The diversity of a tropical Harpacticoida (Copepoda) fauna verification of some ecological hypotheses**
- 14:20      Martínez Arbizu, P. & C. Lott  
**Calanoida, a new taxon for the meiobenthos?**
- 14:40      Rhodes, A.C.  
**Meiobenthic copepod abundance and biodiversity in relation to freshwater releases into a subtropical coastal lagoon**
- 15:00      Souza-Santos, L.P., L. Willadino, R.S. Melo, N. Barros, C. Glasner, P. Xavier, A.P. Brito, D. Galvão, A.A. Gouveia & R.O. Cavalli  
**The trophic relationship between the harpacticoid *Tisbe biminiensis* and newborn seahorse *Hippocampus reidi* juveniles: who is the prey?**
- 15:20      Kihara, T.C. & P. Martínez Arbizu  
**Making the unseen visible: Confocal Laser Scanning Microscopy (CLSM) as a non-invasive method in the study of copepods**
- 15:40-16:00      **Coffee Break**

**END OF SESSIONS IN CONFERENCE ROOM II**

**Tuesday, July 12**

## **CONFERENCE ROOM I**

### **Symposium II: Morphology and Molecules I**

**Chairperson: Rony Huys** (Natural History Museum, UK)

- 09:00      Miracle, M.R., V. R. Alekseev, V. Monchenko, V. Sentandreu & E. Vicente  
**Molecular-genetic based revision of the *Acanthocyclops robustus* group**
- 9:30      Huys, R.  
**Integrating molecules and morphology consensus or conflict in the symbiotic copepods?**
- 10:20– 10:40      **Coffee Break**

### **Symposium II: Morphology and Molecules II**

**Chairperson: Rony Huys** (Natural History Museum, UK)

- 10:40      Bradford-Grieve, J. & L. Blanco-Bercial  
**Calanoid genes and morphology: working together towards a phylogeny**
- 11:30      Hołyńska, M. & G.A. Wyngaard  
**Mouth parts, leg parts, nucleotides and RNA secondary structure: bridging the gap between morphology and molecules in *Cyclops* and *Mesocyclops***
- 12:20 – 14:00      **LUNCH AND POSTER SESSION II**

### **Symposium III: Parasitic and Symbiotic Copepoda I**

**Chairperson: Rony Huys** (Natural History Museum, U.K.)

- 14:00      Huys, R.  
**Introduction to the Symposium**
- 14:05      Boxshall, G.A.  
**Copepods from strange places: sphyriids and pennellids from faeces and regurgitated crop contents of marine birds and mammals**

- 14:25      Madinabeitia, I. & K. Nagasawa  
**New records of *Colobomatus* (Copepoda: Cyclopoida: Philichthyidae) parasitic in the lateral line system of Japanese finfish**
- 14:45      Uyeno, D., D. Tang & K. Nagasawa  
**An undescribed cyclopoid copepod species from a filefish *Pseudomonacanthus macrurus* (Bleeker) (Tetraodontiformes: Monacanthidae) in the Philippines, with a reconsideration of Umazuracolidae Ho, Ohtsuka & Nakadachi, 2006**
- 15:05      Ohtsuka, S., G. A. Boxshall & K. Srinui  
**Phylogenetic analysis of the family Macrochironidae, with the description of an undescribed species of *Paramacrochiron* from the Gulf of Thailand**
- 15:25      Petrunina, A.S. & G.A. Kolbasov  
**Two species of Tantulocarida from the White Sea: what new could they tell us about morphology, anatomy and phylogeny of these minute parasitic crustaceans?**

15:40-16:00      **Coffee Break**

### **Symposium III: Parasitic and Symbiotic Copepoda II**

**Chairperson: Geoff Boxshall** (Natural History Museum, U.K.)

- 16:00      Tang, D., G.W. Benz & K. Nagasawa  
**The demise of Cecropidae Dana, 1849 and Amaterasidae Izawa, 2008**
- 16:20      Dippenaar, S.M.  
**An overview of a comprehensive study on collected *Nesippus* species**
- 16:40      Nagasawa, K., D. Tang, D. Uyeno & I. Madinabeitia  
**Synopsis of symbiotic copepods of aquatic organisms of Japan, with a historical review of research on this group in Japan (1895–2011)**
- 17:00      Kalman Passarelli, J.  
***Acanthochondria* (Copepoda: Chondracanthidae) parasitic on flatfishes in Southern California, U.S.A.**
- 17:20      Kalman Passarelli, J.  
**Remarks on the Parasitic Copepoda Session**
- 17:30      **SPECIAL POSTER SESSION ON PARASITIC AND SYMBIOTIC COPEPODA**

## Wednesday July 13

- 8:30-15:40      Conference Tour to Chichén-Itzá/ Group Photo
- 17:30              Short walk to Quinta Montes Molina
- 17:40-18:20      Janet Bradford-Grieve, President of the World Association of Copepodologists
- Maxilliped Lecture**
- 18:30-20:30      Dinner at *Quinta Montes Molina*

## Thursday July 14

### CONFERENCE ROOM I

#### Oral Session V-RI Freshwater Copepoda I

**Chairperson: Janet W. Reid** (Virginia Museum of Natural History, Martinsville, USA)

- 9:00              Reid, J.W.  
**Stories of Synergy: How Human Diseases Have Informed Copepod Studies, and Vice Versa**
- 9:30              Vezzulli, L., C. Pruzzo, R.R. Colwell & A. Huq  
**Interactions between vibrios and copepods: effects on pathogen persistence, diffusion and transmission to humans**
- 10:00              Awasthi, A.K., C.-H. Wu, J.-S. Hwang  
**Aiming and site specific attack by an ambush predator, *Mesocyclops leuckarti*, on their prey *Aedes aegypti***
- 10:20 – 10:40      **Coffee Break**

#### Oral Session VI-RI Freshwater Copepoda II

**Chairperson: Janet W. Reid** (Virginia Museum of Natural History, Martinsville, USA)

- 10:40              Alekseev, V.R. & F. Yousoff  
**Copepod biodiversity in Eastern Borneo**

- 11:00 Barrera-Moreno, O.A., J. Ciro-Pérez, J.A. Alcántara-Rodríguez & E. Piedra-Ibarra  
**Salinity and insular distribution as factors determining the evolutionary ecology of *Leptodiaptomus* cf. *sicilis* populations from Central Mexico**
- 11:20 Frisch, D., A. Badosa & A.J. Green  
**Patterns of copepod colonisation and diversity in newly constructed temporary ponds in the Doñana National Park, Southern Spain**
- 11:40 Karanovic, T. & M. Krajicek  
**Anthropogenic translocation of freshwater cyclopoids associated with early shipping activities**
- 12:00 López, D.M. & I. Samanez  
**First records of cyclopoid copepods (Cyclopoida: Copepoda) from Peruvian Amazon Basin**
- 12:20 – 14:00 **LUNCH AND POSTER SESSION III**

## **Oral Session VII-RI Marine Planktonic Copepoda III**

**Chairperson: Ruth Böttger-Schnack** (Leibniz-Institute of Marine Sciences, Germany)

- 14:00 Ohtsuka, S., A. Kanazawa, M. Ando & T. Suzaki  
**The life cycle and ultrastructure of histophagous apostome ciliate *Vampyrophrya pelagica* on marine planktonic copepods**
- 14:20 Sano, M. & S. Nishida  
**Feeding habits of mesopelagic copepods in Sagami Bay, central Japan**
- 14:40 Schnack-Schiel, S.B., E. Mizdalski & A. Cornils  
**Occurrence and diversity of calanoid copepods in the Weddell Sea, Antarctica**
- 15:00 Scott-Frías, J. & E. Zoppi de Roa  
**Ecological role of family Eucalanidae (Copepoda: Calanoida) in the northwest coast of Paraguaná (Falcón, Venezuela)**
- 15:20 Stupnikova, A.N. & A.L. Vereshchaka  
**High-resolution survey indicates high heterogeneity in copepod distribution in the hydrologically active area, Drake Passage**
- 15:40– 16:00 **Coffee Break**

## Oral Session VIII-RI: Marine Planktonic Copepoda IV

**Chairperson: Shin-ichi Uye** (Hiroshima University, Japan)

- 16:00      Terbiyik, T., Y. Ak-Orek, Z. Uysal & S. Polat  
**Spring and autumn copepod assemblages in the Cilician Basin (Northeastern Mediterranean)**
- 16:20      Uye, S.-i.  
**Predation on copepods by two Asian bloom-forming jellyfish, *Aurelia aurita* s.l. and *Nemopilema nomurai***
- 16:40      Zoppi de Roa, E. & E. Montiel  
**Spatial and temporal variations of copepods in Venezuelan Atlantic Front**
- 17:00      Palomares-García, R., G. Aceves-Medina & J. Cruz-Hernández  
**Copepods of the Gulf of Tehuantepec during a quiescent upwelling period**

**Friday, July 15**

## CONFERENCE ROOM I

### Symposium IV–Large Scale changes of marine Copepoda

**Chairperson: Sergio Hernández-Trujillo** (CICIMAR-IPN, La Paz, Mexico)

- 9:00      Reid, P.C., G. Beaugrand & P. Helaouët  
**Copepods and climate change: processes behind regime and biogeographic shifts**
- 9:30      Turner, J.T., D. G. Borkman & P. Scott Libby  
**Zooplankton Trends in Massachusetts Bay, USA: 1998-2008**
- 10:00      Escribano, R.  
**Long-term changes of the community structure of marine copepod populations: are they really sensitive?**
- 10:30      **Remarks and Conclusions of Symposium IV**
- 10:40-11:00      **Coffee Break**

## Oral Session IX-RI: Freshwater Copepoda III

**Chairperson: Victor Alekseev** (Russian Academy of Sciences, Russia)

- 11:00      Lugo-Vázquez, A., J. Morlán-Mejía, L. Soriano-Peralta, S.G. López, Ma. G. Oliva-Martínez & Ma. del R. Sánchez-Rodríguez  
**Trophic interactions of planktonic copepods in a hypertrophic shallow lake. A study using mesocosms**
- 11:20      Nandini S. & S.S.S. Sarma  
**Feeding behavior of the copepod *Leptodiaptomus cuauhtemoci* (Osorio-Tafall)**
- 11:40      Martínez-Chávez, M., E. Ortega-Mayagoitia & J. Ciros-Pérez  
**Calanoid copepods are more efficient grazers than cladocerans in an oligotrophic tropical lake**
- 12:00      Ortega-Mayagoitia, E., O. Hernández-Martínez & J. Ciros-Pérez  
**Reproductive biology of *Leptodiaptomus garciai* (Copepoda: Calanoida) in a tropical, oligotrophic crater lake**
- 12:20-14:00      **LUNCH AND POSTER SESSION II**

## Oral Session X-RI: Freshwater Copepoda IV

**Chairperson: Anton Brancelj** (National Institute of Biology, Slovenia)

- 14:00      Mercado-Salas, N., C. Pozo, J.J. Morrone & E. Suárez-Morales  
**Distributional patterns of freshwater genus *Eucyclops* (Copepoda: Cyclopoida: Eucyclopinae) in the Americas: a track analysis**
- 14:20      Sarma, S.S.S., J. Jiménez-Contreras, R. Fernández, G. García-García & S. Nandini  
**Functional responses and grazing rates of *Mesocyclops pehpeiensis* Hu (Copepoda)**
- 14:40      Zibrat, U. & A. Brancelj  
**Distribution and ecology of harpacticoid copepods in the hyporheic of rivers in Slovenia**
- 15:00      **END OF SESSIONS IN CONFERENCE ROOM I**
- 15:40 – 16:00      **Coffee Break**
- 16:00-18:00      **WAC GENERAL ASSEMBLY**

## POSTER SESSIONS

### POSTER SESSION I

Monday 11 and Tuesday 12

#### Experimental Studies, Bioassays, and Rearing of Copepods

1. Awasthi, A.K., C.-H. Wu, K.-H. Tsai, C.-C. King & J.-S. Hwang  
**Does undersize predator induce behavioral modifications on larger prey?**
2. Chen, M.-R., J.C. Molinero, M. Moison & J.-S. Hwang  
**Effects of food and light on *Calanus sinicus* swimming behavior**
3. Cho, M.-f., S. Chullasorn & H.-U. Dahms  
**Copepoda as a model in life science education**
4. Deimantovica, I.D., V. Bardachenko, A. Brakvovska, A. Skute, & A. Solomennikov  
**Dynamics of three calanoid copepods: presumption for behavioural defense in order to reduce possible predation**
5. Enríquez-García, C., S. Nandini & S.S.S. Sarma  
**The effect of *Acanthocyclops americanus* (Marsh) (Copepoda) as competitor and predator in freshwater zooplankton communities**
6. Flores-Rojas, A., B. González-Rodríguez, A. García-Ortega & A.C. Puello-Cruz  
**Intensive production of the copepod *Pseudodiaptomus euryhalinus* and use during first-feeding of the spotted rose snapper (*Lutjanus guttatus*)**
7. Hernández-Trujillo, S., G.M. Esqueda-Escárcega & S. Futema-Jiménez  
**Length-weight relationship of six pelagic copepods from Bahia de La Paz, Mexico**
8. Mendoza-Vera, J.M., S. Kâ, M. Pagano, N. Pech, X. Moreau, M. Bouvy, & C. Cuoc  
**Effects of cyanobacteria on the muscles of *Pseudodiaptomus hessei* and *Thermocyclops neglectus***
9. Mendoza-Vera, J.M., S. Kâ, M. Pagano, & C. Cuoc  
**Ionoregulation organs in a copepod calanoid *Pseudodiaptomus hessei* (Mrazek, 1894)**
10. Mones-Saucedo, J., B. González-Rodríguez, A. García-Ortega, E.A. Zúñiga-Villarreal & A.C. Puello-Cruz  
**A comparison between the *Pseudodiaptomus euryhalinus* copepod and *Artemia* sp. as feed for juveniles of the seahorse *Hippocampus ingens***



11. Nandini, S., V.R. Alekseev, S.S.S. Sarma, M. Benítez, R. Fernández, C. Enríquez-García, G. García-García, M. G. Garza, J. Jiménez-Contreras, F.M.F. Juárez, N. Mercado-Salas, A.R. Núñez, A.F. Peña & C. R. Serrania-Soto

**Mexican cyclopoid biodiversity recorded by the Copepod training course, October 2008, FES Iztacala (Universidad Nacional Autónoma de México)**

12. Raunak, R. Kumar & J.-S. Hwang

**Demographic responses of cyclopoid copepod (*Mesocyclops aspericornis*) to insecticidal phytochemical piperine ((E, E)-1-piperoil-piperidine)**

13. Raunak, R. Kumar & J.-S. Hwang

**Predation by *Pseudodiaptomus annandalei* (Copepoda: Calanoida) on rotifer prey: size selection, egg predation and effect of algal diet**

14. Wu, C.-H., E.J. Buskey, J. R. Strickler, & J.-S. Hwang

**The behavioral patterns of Copepoda *Acartia tonsa* in toxic algae *Karenia brevis***

### **Free-living freshwater Copepoda: Taxonomy, Biogeography and Ecology**

15. Alekseev, V.

**Revision of the genus *Eucyclops***

16. Álvarez-Silva, C., Ma. Gpe. Miranda-Arce & A. Quiroz-Flores

***Acanthocyclops* sp. from the Quarry East, Ecological Reserve of San Angel Pedregal, Mexico**

17. Cervantes-Martínez, A., C. Uh Moo & M.A. Gutiérrez-Aguirre

**Distribution and abundance of limnetic, freshwater copepods (Calanoida, Cyclopoida) from a mesotrophic sinkhole of Quintana Roo, Mexico**

18. Fefilova, E., O.P. Dubovskaya, O. Kononova & L. Khokhlova

**Copepods of the different-type water bodies of the northern part of the Central Palearctic**

19. Gladyshev, M.I., V.P. Semchenko, O.P. Dubovskaya, E. Fefilova, O.N. Makhutova, Zh. F. Buseva, N.N. Sushchik, V.I. Razlutskiy, E.V. Lepskaya, G.S. Kalachova & O.N. Kononova

**Contribution of copepods to contents of essential highly unsaturated fatty acids in freshwater zooplankton according to climatic factor**

20. Gutiérrez-Aguirre, M.A. & A. Cervantes-Martínez

**Calanoida and Cyclopoida from ephemeral and permanent freshwater systems in Chiapas, Mexico: richness and comments about biogeography**

21. Marinone, M.C. & S.A. Menu-Marque

**The distribution of *Boeckella poppei* (Calanoida, Centropagidae) in continental Argentina and Tierra del Fuego**

22. Marrone, F., F. Stoch & D.M.P. Galassi  
**Discovery of a stygobiotic population of the epigeal diaptomid calanoid *Eudiaptomus intermedius* (Steuer, 1897) in Central Italy**
23. Mercado-Salas, N. & E. Suárez-Morales  
**Current knowledge and main taxonomic problems of *Eucyclops* (Cyclopoida: Eucyclopinae) in Mexico**
24. Mercado-Salas, N., E. Suárez-Morales & M. Silva-Briano  
**The first record of the genus *Metacyclops* Kiefer, 1927 (Copepoda: Cyclopidae: Cyclopinae) from Mexico**
25. Perbiche-Neves, G., G. Boxshall, C.E.F. Rocha, J.C. Paggi & M.G. Nogueira  
**Two new species of freshwater Diaptomidae (Calanoida) from Paraná River (South America)**
26. Perbiche-Neves, G., C.E.F. Rocha, G. Boxshall & M.G. Nogueira  
**Geographic distribution of freshwater Cyclopoida in La Plata River Basin, South America**
27. Sabido-Villanueva, P. & A. Cervantes-Martínez  
**Morphological variations in limnetic freshwater copepods (Calanoida, Cyclopoida) from sinkholes in Quintana Roo, Mexico.**
28. Samanez, I. & D.M. López  
**An update on the knowledge of the geographical distribution of *Boeckella* and *Neoboeckella* (Copepoda: Calanoida: Centropagidae) in Peru**
29. Schiller, E.K.  
**Analyses of types of two *Arctodiaptomus* (Crustacea: Copepoda) reveal a morphological feature probably useful for subgeneric differentiation**
30. Silva-Briano, M., E. Suárez-Morales, A. Adabache-Ortiz & M.D. Reyes-Flores  
**The epibiotic ciliate *Trichodina* (Peritrichia) on two diaptomid copepods from Aguascalientes, north-central Mexico: a true parasite?**
31. Sukhikh, N., A. Souissi, S. Souissi & V.R. Alekseev  
**Morphological characterization of *Eurytemora affinis* sibling species**

## **Marine, Coastal, and Estuarine planktonic Copepoda: Ecology and Diversity**

32. Álvarez-Silva, C.  
**Planktonic copepods from Laguna de Términos, Campeche, Mexico**
33. Dias, C.O., S.C. Vianna, A.V. Araujo, L.F. Loureiro Fernandes & S.L.C Bonecker  
**Copepod spatial changes in abundance, biomass and community structure in the tropical Southeastern Atlantic Ocean**

34. Dzierzbicka-Glowacka, L.A., J. Jakacki, M. Janecki, A. Nowicki & B. Wozniak  
**Modelling of the phytoplankton and nutrients seasonal dynamics in the Baltic Sea using 3D CEMBS model**
35. Dzierzbicka-Glowacka, L.A., J. Jakacki, M. Janecki, A. Nowicki, M. Musialik, S. Mudrak-Cegiołka & M.I. Zmijewska  
**Modelling *Pseudocalanus minutus elongatus* population dynamics in the Gulf of Gdansk (south-eastern Baltic Sea)**
36. Gárate-Lizárraga, L., M.A.R. Pacheco-Chávez & G.M. Esqueda-Escárcega  
**Parasitic dinoflagellates (genus *Blastodinium*) infecting copepods of the coast of the State of Baja California Sur**
37. Hwang, J.-S., J. C. Molinero, L.-c. Tseng, Q.-C. Chen & J.-J. Hung  
**Spatial and temporal distributions of copepods in the South China Sea**
38. Lo, W.-T., Pei-K. H., W.-C. Su & D.-C. Liu  
**Copepod assemblages in the waters around Taiwan during two distinct monsoon seasons**
39. Mantha, G., A. K. Awasthi & J.-S. Hwang  
**Comparative study on copepod distribution under three different mesh-sizes around Kueishentao Island, Taiwan**
40. Márquez-Rojas, B., L. Troccoli, J.R. Díaz-Ramos, B. Marín & T. Allen-Peña  
**Copepod community characterization in the Gulf of Cariaco, Venezuela**
41. Melo, P.A.M.C., S. Neumann-Leitão, M. Melo Júnior & L.M.O. Gusmão  
**Production of three dominant calanoid copepods in Saint Peter and Saint Paul Archipelago, a tropical ecosystem from Brazil**
42. Miyashita, L.K., F.P. Brandini, J.E. Martinelli Filho, L.F. Fernandes & R.M. Lopes  
**Seasonal and spatial distribution of copepod and associated assemblages in the Paranaguá Bay Estuarine Complex, southern Brazil**
43. Mudrak-Cegiołka, S., M. Kalarus, A. Renusz, M.I. Zmijewska & L.A. Dzierzbicka-Glowacka  
**Interannual changes of population structure of Copepoda in the Southern Baltic (Gulf of Gdansk, 2006–2007)**
44. Ordóñez-López, U., M. Ornelas-Roa, E. Suárez-Morales & P. Ardisson  
**Variation of planktonic copepod community in the hypersaline gradient of Rio Lagartos lagoon Yucatan, Mexico**
45. Ornelas-Roa, M., U. Ordóñez-López, E. Suárez-Morales & P. Ardisson  
**Planktonic copepods of a coastal lagoon and adjacent areas in northern Yucatan Peninsula, Mexico**

46. Pagano, M., P.B. Sagarra, G. Champalbert, M. Bouvy, C. Dupuy, Y. Thomas & L. Charpy  
**Copepod communities in the lagoon of Ahe atoll (Tuamotu Archipelago, French Polynesia). Spatiotemporal variations and trophic relationships**
47. Palomares-García, R., E.R. Kozak, J. Gómez-Gutiérrez & A. Martínez-López  
**Offshore egg production rates of *Centropages furcatus* in the Gulf of California, Mexico during autumn environmental conditions**
48. Panasiuk-Chodnicka, A., M.I. Zmijewska & L. Dzierzbicka-Glowacka  
**How big is the influence of most dominant antarctic copepods on siphonophores foraging behavior?**
49. Park, E-o., H.-L. Suh & H. Y. Soh  
**Occurrence characteristics of the estuarine copepods, *Pseudodiaptomus inopinus* and *P. poplesia* (Calanoida, Pseudodiaptomidae) in the Mankyung River Estuary, Western Korea**
50. Pessoa, V.T., M. Melo Júnior, L.G.P. Figueirêdo, M. Guenther & S. Neumann-Leitão  
**Copepod production in a highly impacted metropolitan estuary in tropical Brazil**
51. Seo, M.-H., H.Y. Soh & K. S. Shin  
**Occurrence patterns of copepods occurring in main trade ports of Korea during summer**
52. Silva, A.P., T.A. Silva, M. Melo Júnior, R. Schwamborn & S. Neumann-Leitão  
**Transport of planktonic copepods at a tropical estuarine inlet in Brazil**
53. Tseng, L.-C., H.-U. Dahms, Q.-C. Chen & J.-S. Hwang  
**Mesozooplankton and copepod community structures in the southern East China Sea during the monsoon transition period**

## **POSTER SESSION II**

Thursday 14 and Friday 15

### **🌊 Marine, Coastal, and Estuarine planktonic Copepoda: Ecology and Diversity II**

54. Tseng, L.-C., H.-U. Dahms, R. Kumar, Q.-C. Chen & J.-S. Hwang  
**The shallow mixed layer of the subtropical South China Sea reveals a particular autumn copepod community structure**
55. Vianna, S.C., C.O. Dias, A.V. Araujo, L.F. Loureiro Fernandes & S.L.C Bonecker  
**Vertical changes in abundance and community structure of copepods down to 2,300 m in the tropical Southeastern Atlantic Ocean**
56. Weydmann, A., J. Carstensen, A. Olszewska, W. Walczowski & S. Kwasniewski  
**Looking for tipping points: case study of copepods of the West Spitsbergen Current**

57. Wi, J.H. & H.Y. Soh  
**Two *Farranula* (Copepoda, Cyclopoida, Corycaeidae) species from the Korean water**
58. Wi, J.H. & H.Y. Soh  
**Two new species belonging to the dentipes- and conifera-subgroup from the East China Sea**
59. Wu, C.-H., L.-C. Tseng, R. Kumar, T. Kaob, G-S. Lian & J.-S. Hwang  
**Six year's observations of the copepod community structure in a mixed semi-enclosed embayment adjacent to tropical West Pacific**
60. Yáñez, S., P. Hidalgo & R. Escribano  
**Passive Carbon flux of copepod *Paracalanus indicus* (Copepoda: Calanoidea) (Wolfenden, 1905) in coastal upwelling zones of the Humboldt Current System associated with the oxygen minimum zone**

### **Marine and Freshwater Harpacticoida**

61. Back, J. & W. Lee  
**Two new species of the genus *Apodopsyllus* Kunz, 1962 (Harpacticoida, Paramesochridae) from the South Sea, Korea**
62. Björnberg, T.K.S. & T.C. Kihara  
**Harpacticoid copepods of the marine benthos in the Channel of São Sebastião, SP, Brazil and vicinity**
63. Candás, M., P. Martínez Arbizu & V. Urgorri  
**A new species of Leptopontiidae Lang, 1948 from the Ría de Ferrol (NW Iberian Peninsula)**
64. Chullasorn, S., P. Klangsin & P. Kangtia  
**A review on *Tigriopus* (Copepoda, Harpacticoida, Harpacticidae) with a new species from Thailand**
65. Chullasorn, S., X-S. Liu & H-U. Dahms  
**Meiobenthic communities in sediments of seagrass beds**
66. Gómez, S. & C. Varela  
**A new species of *Alteutha* Baird from north-western Mexico**
67. Gómez, S. & F.N. Morales-Serna  
**On a small collection of Laophontidae T. Scott (Copepoda: Harpacticoida) from Mexico. I. New species and new records of *Laophonte* Philippi and *Paralaophonte* Lang**
68. Gómez, S. & F.N. Morales-Serna  
**On a small collection of Laophontidae T. Scott (Copepoda: Harpacticoida) from Mexico: II. New records of *Quinquelaophonte* Wells, Hicks & Coull and description of *Onychoquinpes permixtionins* gen. nov. et sp. nov.**

69. Kangtia, P. & S. Chullasorn

**A new species of the genus *Ectinosoma* Boeck, 1865 (Copepoda: Harpacticoida: Ectinosomatidae) from Thailand**

70. Kihara, T.C. & P. Martínez Arbizu

**Three new species of *Cerviniella* Smirnov, 1946 (Copepoda: Harpacticoida) from the Arctic**

71. Kihara, T.C. & P. Martínez Arbizu

***Pontostratiotes* Brady, 1883 (Copepoda: Harpacticoida) from Angola deep-sea Basin (Southeast Atlantic, DIVA 1)**

72. Kim, K. & W. Lee

**A new species of *Enhydrosoma* (Copepoda: Harpacticoida: Cletodidae) from the sublittoral zone, Gwangyang bay, Korea**

73. Park, E. & W. Lee

**A new species of the genus *Paraleptastacus* (Copepoda: Harpacticoida: Leptastacidae) from the subtidal zone of Naksan beach, Korea.**

74. Song, S.L., J. Park, J. Ryu & J.S. Khim

**Comprehensive checklist of marine and brackish harpacticoid fauna in Korean waters and its implications**

75. Varela, C. & S. Gómez

**Two new species of Peltidiidae Sars, 1904 (Copepoda: Harpacticoida) from Cuba**

## **Molecular and Genetic studies of the Copepoda**

76. Dalvin, S., F. Nilsen & R. Skern-Mauritzen

**Vasa, a molecular marker of the gonads in salmon louse (*Lepeophtheirus salmonis*, Krøyer, 1837)**

77. Wyngaard, G.A., F.P.L. Marques & C.E.F. Rocha

**Resolving relationships among lineages of cyclopoids and poecilostomatoids using 18S and partial 28S ribosomal DNA sequences**

## **Parasitic and Symbiotic Copepoda: Biology and Taxonomy**

Marked () poster presentations are part of the Special Symposium on Parasitic and Symbiotic Copepoda

78. Abad, M., G. Díaz-Agras, J. Moreira, A. García-Regueira, R. Tato, M. Candás, Y. Lucas, X. Cunha & V. Urgorri

**Natural History of *Lomanoticola brevipes* Hancock & Norman, 1863, (Copepoda, Poecilostomatoida, Splanchnotrophidae) at the Ría de Ferrol (Galicia, NW Iberian Peninsula): external anatomy, behaviour and reproduction**

79. Bandera, E. & M. Conradi

**Redescription of five *Asterocheres* species (Copepoda: Siphonostomatoida) and a description of a new species discovered in the collections of the Zoological Museum of Amsterdam** ■■

80. Conradi, M.

**Three artotrogids (Copepoda: Siphonostomatoida) from the Ross Sea, Antarctica** ■■

81. González-Armas, R. & S. Hernández-Trujillo

**Preliminary results on parasitic copepods in large pelagic fishes caught by sport fishing fleet in Cabo San Lucas, B.C.S. Mexico.**

82. Ivanenko, V.N., M. Wakeford, J. Caley, C. Walter & N. Ivanova

**New data on the diversity, host specificity and distribution of crustacean copepods associated with stony corals (Cnidaria: Anthozoa: Scleractinia) of the Indo-Pacific coral reefs** ■■

83. Jeon, D., D.H. Lim & W. Lee

**Two new species of monstrilloid copepods from Korean waters** ■■

84. Kaji, T.

**Structure, development and evolution of the “lunule” in caligid copepods**

85. Kalman Passarelli, J., D. Tang, K. Nagasawa, J.S. Ho, G. Boxshall & R. Johnsson

**The 1st International Workshop on Symbiotic Copepoda (IWOSC) at Cabrillo Marine Aquarium, San Pedro, California, U.S.A.** ■■

86. Kim, I.-H. & R. Huys

**Sabelliophilid copepods associated with the tube anemone *Pachycerianthus maua* (Carlgren, 1900) and the horseshoe worm *Phoronis australis* Haswell, 1883 in New Caledonia** ■■

87. Lin, C.L. & J.S. Ho

**A new species of *Cirracanthus* (Poecilostomatoida: Taeniacanthidae) parasitic on a marine fish of Taiwan**

88. Madinabeitia, I. & K. Nagasawa

**Double-netting: an efficient method for the recovery of parasitic copepods from finfish** ■■

89. Morales-Serna, F.N., M. Rubio-Godoy & S. Gómez

**Seasonality of parasitic copepods on the bullseye puffer *Sphoeroides annulatus* (Pisces: Tetradontidae) from the northwest coast of Mexico** ■■

90. Nagasawa, K.

***Caligus epidermicus* (Copepoda: Caligidae), a pathogenic sea louse of wild and farmed fishes in the Indo-West Pacific region: a review** ■■

91. Nagasawa, K. & M. Obe

**Seasonal occurrence and host-associations of *Neoergasilus japonicus* (Copepoda: Ergasilidae) infecting bluegill (*Lepomis macrochirus*) in a reservoir in a temperate region of Japan** ■■

92. Rosim, D.F., P.S. Caccarelli & G.A. Boxshall

**The urinary bladder of freshwater fishes: a new microhabitat for copepods of the family Ergasilidae in Brazil**

93. Suárez-Morales, E. & R. Gasca

**Diversity of the Monstrilloida (Copepoda): current status and perspectives** ■■

94. Tang, D., B.A. Venmathi Maran, Y. Matsumoto & K. Nagasawa

**Redescription of *Lepeophtheirus acutus* Heegaard, 1943 (Copepoda, Caligidae) parasitic on two elasmobranch hosts off Okinawa-jima Island, Japan** ■■

95. Torres, R., J. Scott-Frías & E. Zoppi de Roa

**First record of inland ergasilids (Copepoda: Ergasilidae) in Venezuela**

96. Uyeno, D. & K. Nagasawa

**Copepods of the genus *Hatschekia* Poche, 1902 (Siphonostomatoida: Hatschekiidae) parasitic on tetraodontiform fishes (Actinopterygii) from Japanese waters** ■■

97. Venmathi Maran, B.A., D. Tang, I. Madinabeitia, K. Izawa, S. Ohtsuka & K. Nagasawa

***Pseudacanthocanthopsis secunda* Yamaguti & Yamasu, 1960 (Copepoda, Chondracanthidae) parasitic on fishes from the Seto Inland Sea, Japan, and the East China Sea** ■■





# SOCIAL PROGRAM



July 10–15, 2011

## WELCOME COCKTAIL

### Sunday July 10, 2011

18:00-20:30

We will have a welcome cocktail after the arrival and registration process. This will include Mexican and Yucatecan snacks and soft drinks. Clearly, a great opportunity to greet the participant colleagues and have a relaxing moment before the Conference.

## QUINTA MONTES MOLINA (Maxilliped Lecture)

### Wednesday July 13, 2011

17:20-20:30

The *Quinta Montes Molina* is an historical mansion; it was once known as Villa Beatriz, built during the Porfirio Díaz dictatorial period (1876–1911). It is a beautiful building with eclectic architecture and neoclassic tendencies. The Maxilliped Lecture will take place in this outstanding house; this will be the perfect opportunity to see the inside of an elegant, authentic, fully and beautifully furnished Paseo Montejo mansion, with the original chandeliers, mirrors, antique furnishings, rugs, paintings, statues and sculptures, Limoges china and Christofle silverware. The address is Paseo de Montejo No. 469 x 33 and 35, just steps from the official hotel (Hyatt Regency) and 5 minutes from the Historical Center in downtown Mérida.



## ACCOMPANYING PERSONS PROGRAM

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**Monday July 11, 2011**

**City Tour with lunch at Hacienda Misné**

*Itinerary:*

- 10:30 Departure from hotel, a bus will take us to visit the main points of interest of the city
- 11:15 Arrival at the Zócalo of Mérida for a walking tour visiting the main historical buildings
- 11:45 Shopping time
- 12:30 Bus ride to Hacienda Misné
- 13:00 Arrival at the Hacienda Misné and time for food
- 15:00 Depart to the Hyatt hotel
- 15:30 Arrival at Hotel Hyatt



**MÉRIDA**

In this panoramic tour, we will see beautiful buildings such as Plaza Mayor, the Cathedral of San Ildefonso, the Government Palace, the Casa de Montejo, the Palacio Municipal, the Church of the Nuns, the Paseo de Montejo with stately buildings of the early century XX with a strong French influence, and the monument to the Patria and Mexican Flag.

Later on, and lead by expert guides, we will travel by foot the main buildings of the main square for 30 minutes. We will then have free time for shopping in the downtown zone. At the end, we will be transported to the Hacienda Misné where we will enjoy the beauty of its facilities and a meal.



**HACIENDA MISNÉ**

First *Hotel Indigo* in Mexico, this is a former Yucatecan Hacienda built in the eighteenth century which combines local tradition with the perfection of hospitality. It has beautiful outdoor locations in enclosed areas for social events.

**Monday July 11, 2011 (Optional Night Tour, free for accompanying persons; available for participants: 48 USD)**

**Uxmal Light and Sound Show**

*Itinerary:*

- 18:00 Departure from your hotel to the highway to Uxmal
- 19:30 Arrival at Uxmal
- 20:00 Sound and Light historical show
- 20:45 Departure from the archaeological area and the group walks to the Lodge restaurant for dinner.
- 22:30 Depart to the Hyatt Hotel
- 24:00 Arrival at Hotel Hyatt



## **UXMAL**

Uxmal means "thrice built" in Mayan language and although it is an archaeological mystery, its beauty is not. As a "Cultural Heritage of Humanity (UNESCO)" is one of the most restored Mayan ruins, truly magnificent. Its architecture, some of the most majestic of the Mayan influence of Yucatan, is characterized by low horizontal palaces set around courtyards, decorated with rich sculptural elements and details. Uxmal holds some of the most complex and beautiful examples of the regional Puuc-style architecture.

## **Tuesday July 12, 2011**

### **Celestún**

#### *Itinerary:*

09:00 Departure from your hotel to Ria Celestún  
10:30 Arrival and Boat Tour (Duration 1 hour)  
12:00 Departure from beach to the adjacent port of Celestún  
12:15 Lunch at beachfront restaurant and time to enjoy the beach.  
15:00 Departure to Merida  
16:30 Arrival at hotel



Just 92 km from Mérida, Celestún is one of the most picturesque ports of the coast; it has different natural attractions that are well worth visiting. In Celestún you can find extended beaches, many of which are untouched, local fish and seafood are excellent. The main attraction is the large number of pink flamingoes dwelling in this area, an interesting contrast of colours with the green-blue waters of the Ria Celestún. Flamingoes can be observed at very short distance, taken by trained guides.

*Note:* It is recommended to wear beach clothes, bathing suit and bring along sunscreen, beach hat, and towel.

## **Wednesday July 13, 2011**

### **Mid-conference Tour to Chichén Itzá**

## **Thursday July 14, 2011**

### **Trip to the Alive Hacienda Sotuta de Peón**

#### *Itinerary:*

09:00 Departure from hotel to Sotuta de Peon Hacienda  
10:00 Arrival at the Hacienda and initiate visit.  
12:30 End of visit and lunch at the Hacienda restaurant  
15:00 Departure to Mérida  
16:00 Arrival at hotel Hyatt

#### **The trip to the Hacienda Sotuta Peón includes:**

Guided Tour by active Hacienda Henequenera  
Welcome Cocktail  
Visit the Main House  
Corchada Manual (Explanation and Process)  
Raspa (Explanation and Process)  
Power Museum (Explanation of the evolution of machinery)  
Press (Making of bales)



Corchería (Machines in Process)

Casa Maya (Maya House explanation, Seeding of Henequen)

Visit to the **Cenote Dzul-Ha** (Option of swimming, goggles, jackets and towels included)

Swimming pool: (Option of swimming: goggles and towels included)

## Friday July 15, 2011

### Izamal Magic Town

#### *Itinerary:*

10:00 Departure from the hotel in Mérida to Izamal

10:45 Arrival to the Magical Town of Izamal and start of the visit, walk around the main attractions of the town and visit Craft Workshops.

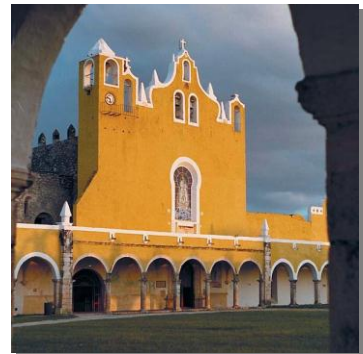
13:00 Lunch at Restaurant Kinich Kakmó, local food.

14:30 Departure to Merida

Approximate arrival at the hotel 15:15

#### **IZAMAL**

Upon reaching the city you will find yellow and white colors in all facades. The city is picturesque, lively and animated, ideal for walking the quiet streets and admiring its houses, squares and corners. Visit the Convent of San Antonio de Padua in charge of Franciscan friars. The majestic XVI century building is located in the center of the city, on the temple called Pop-Hol-Choc (Mayan priests' residence) is the most blatant example of a building constructed with material from pre-Hispanic edifications. Notably, the court of the convent is considered the largest in the Americas; a statue recalls the visit of Pope John Paul II to the Yucatan in August 1993. Another point to visit is the pyramid of Kinich Kak Moo; this is the third structure with the greatest volume in pre-Hispanic Mexico. The tour includes a visit to the Cultural Centre and Handcraft to see and buy the wide variety of local handcrafts.



## OPTIONAL POST CONFERENCE TOURS

These tours will be offered at the desk of *AmigoYucatan*, the official travel agency of the 11th ICOC.