Volume 37, 1 *May, 2018*

The Ecdysiast

The Newsletter of The Crustacean Society

Inside…..

TCS President, Shirley Lim, welcoming everyone to the conference.

Thank you to all who organised and participated in the 9th International Crustacean Congress recently held in Washington D.C

It was a great success!

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The Ecdysiast is published twice yearly in May and November and it is available in electronic form at http://www.thecrustaceansociety.org/ecdysiast. All the past issues are also available from the same web site. Submissions for the May newsletter should be received by mid March, while those for the November newsletter should be received by mid September. All types of crustacean related contributions are encouraged, including announcements of upcoming workshops and meetings, regional updates, meeting summaries (with photos!), new publications and any other crustacean news.

Send all material directly to the editor:
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The Crustacean Society Liaison Officers, 2018

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Treasurer's Report for May 2018

Currently, TCS has 420 members (215 online members, 70 print and online members, 24 patron members, and 111 student members). TCS investments are doing well, with our Schwab accounts totaling approximately US$575K. In addition, the society had a positive net income in 2017 of approximately US$10K. Burk and Associates, Inc. (BAI) has been providing financial and support services for the society since January 2017 and is undertaking a full analysis of the financial records and bringing the bookkeeping up to date. Their services for TCS include membership support and handling of dues, accounting and financial services, bookkeeping, taxes and compliance issues. Through the help of BAI, the room attrition at the Renaissance Hotel for the International Crustacean Congress 9 (ICC 9) in Washington, DC was waived (saving the society ~ US$12-20K). However, TCS will likely have a shortfall of ~US$10K in 2018 and will have to use earnings from the Schwab account investments to cover the gap. In terms of income from JCB, TCS will receive US$30K from OUP profit share for all income aside from the membership dues for the year 2017. The OUP profit share is projected to go up to ~$50K by 2021. The Financial Committee of TCS (President Shirley Lim, President-Elect Ingo Wehrtmann, Past-President Brian Tsukimura, Treasurer Jason Williams, Secretary Sarah Gerken, and Program Officer Benny Chan) recently voted to approve the OUP proposed rate increase of 5% for 2019 (5% increase for 2019 JCB subscriptions and 5% increase for Author Processing Charges (APC)). The Financial Committee will continue working on the proposed budget for 2019 and I will submit that (plus the 2018 accounts) for the fall issue of the Ecdysiast.

Respectfully submitted,
Jason Williams

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TCS Research Fellowships and Travel Awards

The Crustacean Society (TCS) annually awards fellowships and travel awards in several categories. Applicants for all awards must be TCS members, and in the case of student awards, their faculty sponsor/mentor must also be a TCS member at the time of application.

Student Travel Awards for 2018 - ICC9, Washington, DC

TCS annually awards a maximum of ten (10) US$500 awards to support student attendance at TCS meetings (mid-year or SICB). Applicants must be enrolled in an undergraduate or graduate degree program, be the presenter of an oral or poster presentation at the TCS meeting they attend and demonstrate financial need for TCS support of travel to the meeting.

Simon Bober (Universität Hamburg, Germany)
An organ of equilibrium in deep-sea isopods revealed: the statocyst of Macrostylidae (Crustacea, Peracarida, Janiroidea).
Jonas C. Geburzi (Universität Kiel, Zoological Museum, Germany)
Seeking for salinity: larvae of an invasive crab perform horizontal migrations to optimize development conditions.
Katja Kienbaum (Humboldt-Universität zu Berlin, Germany)
The reproductive system of *Limnopilos naiyanetri* (Hymenosomatidae) indicates a thoracotreme affiliation.
Javier Luque (University of Alberta, Canada)
The evolution of true crabs through time: insights from the tropical Americas.
Cara Van Der Wal (University of Sydney, Australia)
Reconstructing the phylogeny of mantis shrimps (Stomatopoda): are rates of molecular and morphological evolution correlated?
Sing-Pei Yu (National Taiwan University, Taiwan)
Eat microplastics, die early? Do microplastics lead to higher mortality of barnacle larvae?
Meng-Chen Yu (National Sun-Yat-Sen University, Taiwan)
How to walk and settle on a bed of nails? Extreme variation of antennular structure, settlement process and metamorphosis of sponge-inhabiting barnacle

Fellowships in Graduate Studies
TCS annually awards up to six US$1,000 fellowships in graduate studies in any field on the biology of crustaceans. The fellowship is to support the research objectives and career goals of the student and requires a letter of support from their faculty sponsor or mentor.

Mael Glon (Ohio State University Museum of Biological Diversity, USA) – Taxonomy of the devil crayfish (*Cambarus diogenes*) from the North American Great Plains.
Tom Levy (Ben-Gurion University of the Negev, Israel) – New gonochorism in crustaceans?
Alejandro López-Cerón (Colorado State University, USA) – Roles of genes of stress response in the molt cycle of decapods.
Kaitlyn Lowder (Scripps Institution of Oceanography, USA) – Larval spiny lobster predator defenses face a new foe: changing ocean chemistry.
Sitara Palecanda (University of Hawai`i at Mānoa, USA) – Vision and ecology of larval stomatopods under ultraviolet light.
Tyler Wood (Bowling Green State University, USA) – Indirect effects of predator dietary cues on macrophyte communities mediated by crayfish behavior.

TCS Research Fellowships and Travel Awards

Early career, post Ph.D. travel awards
TCS annually awards up to three US$1,500 travel grants for early-career researchers with a Ph.D. awarded within 5 years of the application deadline. Extension of up to 8 years post- Ph.D. will be considered at the discretion of the Program Officer for applicants having taken a career break for family reasons. The grants shall cover travel to present, preferably in an oral session, results of their research in any field of study involving crustaceans at a TCS meeting (mid-year or SICB). Applications that will result in a manuscript suitable for publication in *Journal of Crustacean Biology* will be given preference.

Travel Award for 2018 - ICC9, Washington, DC
Dr. Nicolas Lessios-Damerow (Arizona State University, USA) – "Multiple spectral channels in branchiopods: Vision in dim light and neural correlates"

2018 TCS Excellence in Research Award Awarded at ICC9, Washington DC to Professor Jianhai Xiang

Prof. Jianhai Xiang from the Institute of Oceanology, Chinese Academy of Sciences, won the 2018 Excellence in Research Award of the Crustacean Society. This is the highest global award given to a crustacean researcher on his research achievements. The award is intended to honor outstanding contributions towards the furthering of carcinology as a science. Such is the contribution of Prof. Xiang who is setting an example of several decades of persistence, dedication and achievements in our field, taking it into directions that were not explored before.

Many of us are following Prof. Xiang's footsteps who is regarded by many the scientist who initiated modern marine biotechnology research as one of the pioneers in China. Starting with the works on macroalgae by the late Prof. C.K. Tseng at the Chinese Academy of Sciences, aquaculture has always been the major area of marine research in China since the 1950s. Yet modern biotechnology approach only started in the early 1990s after Prof. Xiang joined the institute, through the introduction of molecular techniques. When scientific researches were poorly funded in China in the 1990s, Prof. Xiang was able to initiate innovative research on the induction of triploidy in shrimp. As shrimp disease such as the white spot syndrome has been the major issue in shrimp aquaculture in China, Prof. Xiang has focused his research on shrimp immunology and established his reputation in this area through the identification of various immune-related genes including antimicrobial peptides. Prof. Xiang has done a lot of pioneering work in the field of marine shrimp innate immunity research: his team has been studying the molecular mechanisms of the responses of shrimp to bacteria/virus infections and to environmental stresses, outlining the overall frame of the innate immune system in shrimp. He was the first to propose the important role of "immune homeostasis" in the shrimp immune system, outlining the fundamental theory of crustacean immunology, and thus resulting in important recommendations for disease control in Crustaceans. As a guest editor of the journal "Developmental & Comparative Immunology" he edited and published the treatise "Progress in Immunology Research in China" reviewing the progress of innate immunity in shrimp.

In the early 1980's, Prof. Xiang carried out cytogenetics and reproductive biology research in crustaceans and molluscs. He was the first to report the chromosome numbers and karyotypes in a variety of economically important shrimps and crabs. Using confocal laser scanning microscopy and advanced biochemical methods, he revealed the reproductive endocrine control process in shrimp and crab. His group analyzed the morphology and functions of androgenic glands in shrimp and improved the understanding of the shrimp reproductive process. As of the 1990's, he began to use isozymes, microsatellites and other genetic markers to study the genetic diversity of different geographical populations of shrimp in China. In 1999, he edited the

TCS Excellence in Research Award Awarded at ICC9, Washington DC to Professor Jianhai Xiang

Professor Jianhai Xiang accepting his TCS Excellence in Research Award from Past-President, Brian Tsukimura.

first book dealing with the genetics of marine animals entitled "Cytogenetics and Population Genetics of Marine Animals".

Being the first to develop and apply molecular genetics and genomic studies on marine shrimp in China, Prof. Xiang started with EST sequencing and functional genomics at the end of last century. He constructed the first cDNA shrimp microarray with middle-high density to screen the immune related genes of shrimp. Around the same time, he also developed at his laboratory a proteomic platform for shrimp study. Under his leadership the first linkage genetic map of *Litopenaeus vannamei* , using AFLP and microsatellite markers, was constructed as early as in 2007, and his lab recently published a new high density genetic map with SNPs. His team also constructed the first shrimp BAC library. Prof Xiang is now the leading scientist of the shrimp genome project, and the sequencing of *L. vannamei* and *Fenneropenaeus chinensis* have recently been completed. The availability of this genome information will open new horizons in marine aquaculture genome research by providing novel insights into comparative genomics, developmental biology, evolutionary genomics and genetic breeding of shrimp.

Aside from his impressive research career, publication record and numerous patent applications, Prof Xiang has successfully taken up important academic positions at the highly recognized Institute of Oceanology of the Chinese Academy of Sciences in Qingdao: chairman of the Key Laboratory of Experimental Marine Biology (1997-2007), Associate Director (1994-97) and Director (1998-2006). His research achievements have won him numerous awards in China including the prestigious C.K. Tseng award for outstanding achievements in marine scientific and technological research in 2016. Prof. Xiang actively served the communities of carcinology and marine science in China and the world. In particular, he served as chairman of the Chinese Crustacean Society from 2002-2013, served as the Asian Governor of TCS in 2007-2012, and organized the 7th International Crustacean Congress in 2010. Based on all the above, the crustacean society has decided to bestow the 2018 Excellence in Research Award of the Crustacean Society upon Prof. Jianhai Xiang.

Amir Sagi – Ben Gurion University, July 2018

TCS Best Student Paper and Best Student Poster ICC9 Washington D.C., 2018

The Crustacean Society (TCS) is pleased to announce the winners of the Best Student Paper and Poster Competition held during Ninth International Crustacean Congress held between 22–25 May in Washington DC, USA. The best student Oral Presentation Award was presented to Sing-Pei Yu (National Taiwan University, Taiwan): "Eat microplastics, die early? Do microplastics lead to higher mortality of barnacle larvae?" The best student Poster Presentation was presented to Eric Moreno (Universidad Nacional Autónoma De México, Mexico): "Phylogenetic Approach of the Mexican Freshwater Crabs Genus Tehuana (Decapoda: Pesudothelphusidae), Using Morphological and Genetic Evidence". Awards were presented by The Crustacean Society President, Shirley Lim. Each award consists of a certificate, US $100 cash, and a one-year membership in The Crustacean Society, including subscription to The Journal of Crustacean Biology.

Best Oral Presentation

Sing-Pei Yu (National Taiwan University, Taiwan)
Eat microplastics, die early? Do microplastics lead to higher mortality of barnacle larvae?

Plastic litter negatively impact the marine life. Plastic debris smaller than 5 mm in diameter are classified as microplastics. Microplastics can be generated during plastic manufacturing or came from degradation of larger plastic fragments in the nature enviroment. Compared to macroplastics, the influence of microplastics on marine life are still largely unknown. Although most studies have evaluated the effect of microplastics on responses of adults but relatively less studies focus on larvae. Another constrain is the short experiment time. In the present study, we used barnacle naupliar larvae (*Amphibalanus amphitrite*), as a model organism for crustacean larvae, to investigate the ingestion of four sizes of polystyrene microbeads (diameter 1.0, 6.8, 10, 20 μm respectively) at four concentrations(1000, 100, 10, 1, 0 beads ml -1). After exposing to microplastics from nauplii to cyprids, nauplii mortality, development time, growth and metamorphosis rate were not significantly different from control which didn't receive any microplastics. Moreover, feeding ability of nauplii were barely effected at highest concentration (1000 beads ml -1). Nauplii appeared to prefer feed on microplastics, when microalgae and microplastics were presented at the same amount. After ingestion, microplastics was egested together with digested algal materials within two hours. Fecal pellets contained microplastics with digested algal materials sank to the bottom rather than float in water column. As a result, ingestion of microplastics by zooplanktons can transform microplastics to the benthic environment.

Honorable mentions
Valentin de Mazancourt (Muséum National D'Histoire Naturelle, France)
The Complex Study of Complexes: the First Well-Supported Phylogeny of Two Species Complexes Within Genus Caridina (Decapoda: Caridea: Atyidae) Sheds Light On Evolution, Biogeography, and Ecology.

Diana Martinez-Alarcon (University of Bremen, Germany)
Hepatopancreas Transcriptome Analysis of the Brown Shrimp, *Crangon crangon* (Decapoda, Caridea), Reveals Expression of Polymorphic Digestive Enzymes.

Nan Yao (Florida International University, USA)
Investigating the Connectivity of the Florida Spiny Lobster Recruit Using Microsatellites.

TCS Best Student Paper and Best Student Poster ICC9 Washington D.C., 2018

Best Poster Presentation
Eric Moreno (Universidad Nacional Autónoma De México, Mexico)
Phylogenetic Approach of the Mexican Freshwater Crabs Genus Tehuana (Decapoda: Pesudothelphusidae), Using Morphological and Genetic Evidence.

The freshwater crabs of the genus Tehuana include a group of eight species, which are distributed along the southeastern of Mexico through the states of Veracruz, Oaxaca, Tabasco and Chiapas. Morphologically are characterized by the presence of a first par male gonopods slender and cylindrical proximally and distally depressed; the main axis shows an evident conical meso-distal prominence as well as a medial constriction on the lateral surface; in addition, on the inner surface of the proximal lobe of the caudo-marginal projection, a strong and sharp carina protrudes. The morphology and distribution of each species of this genus has been well studied, but in areas with complexes geological histories and orographic conformations, the crabs populations present evident morphological variations among them and with the nominal species, which makes difficult its taxonomic determination. In this work two phylogenetic reconstructions, morphological and molecular, were carried out. The morphological analysis of parsimony in TNT, included somatic and reproductive (first male gonopod) characters. The molecular consisted of an analysis of Bayesian Inference in Mr. Bayes, analyzing three markers, two mitochondrial (COI and 16S) and one nuclear (H3). In our results the genus Tehuana was retrieved as monophyletic group and sister of the genus Pseudothelphusa, with a strong statistical support, also there were found species that comprise complexes of forms, in the particular case of T. poglayenorum, the specimens of several localities were recovered as lineages independent of the nominal species.

Honorable mentions
Jessica Colavite (University of São Paulo State, Brazil)
Taxonomic Revision of the Eastern Pacific Species of *Stenocionops* Desmarest, 1823 (Decapoda: Brachyura).

Hwang Hee-Seung (Seoul National University, Korea)
First Record of Six Species of Mantis Shrimp from Korea (Crustacea: Stomatopoda).

Cara Van Der Wal (University of Sydney, Australia)
Assessing the Conservation Status and Genetic Diversity of the Giant Sydney Crayfish, *Euastacus spinifer* Using Molecular Approaches.

TCS Best Student Paper and Best Student Poster ICC9 Washington D.C., 2018

Sing-Pei Yu (National Taiwan University, Taiwan)

Nan Yao (Florida International University, USA)

Valentin de Mazancourt (Muséum National D'Histoire Naturelle, France)

Diana Martinez-Alarcon (University of Bremen, Germany)

TCS Best Student Paper and Best Student Poster ICC9 Washington D.C., 2018

Eric Moreno (Universidad Nacional Autónoma De México, Mexico)

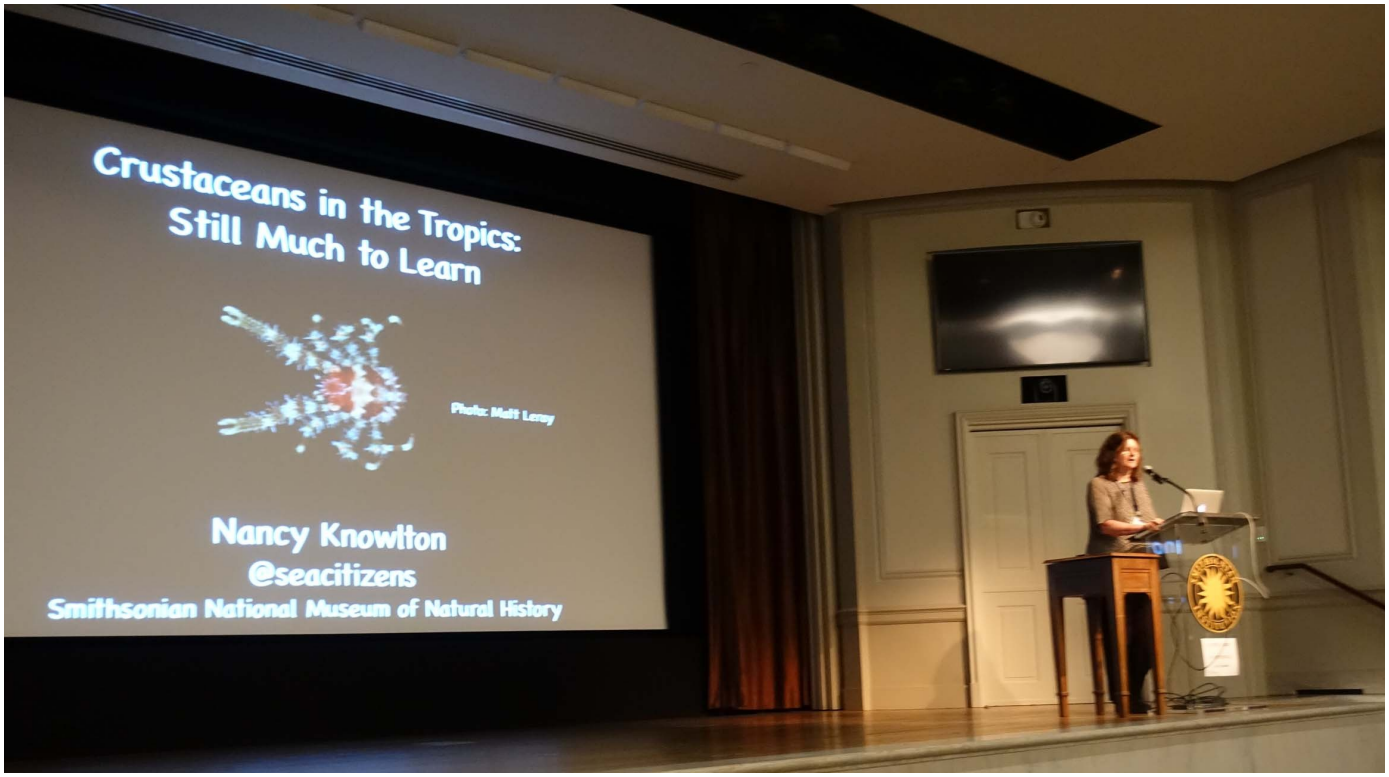
Cara Van Der Wal (University of Sydney, Australia)

Jessica Colavite (University of São Paulo State, Brazil)

Hwang Hee-Seung (Seoul National University, Korea)

ICC9 Washington D.C., 2018 more photos...

TCS President, Shirley Lim, welcoming everyone to the conference.



Nancy Knowlton (Smithsonian National Museum of Natural History) giving the plenary session on the opening morning.

ICC9 Washington D.C., 2018 more photos...

TCS Past-President, Brian Tsukimura (left), and TCS President-Elect Ingo Wehrtmann (right).

TCS Treasurer Jason Williams

ICC9 Washington D.C., 2018 more photos...

TCS Past-President, Brian Tsukimura, and current TCS President Shirley Lim.

ICC9 Washington D.C., 2018
more photos...

These are two photos from the Saturday field trip to the Smithsonian Environmental Research Center: one of participants dip-netting for the shrimp *Palaemonetes* to check for parasites (above) and the other (left) of participants learning about tagging blue crabs. One brave lady is learning how to hold one without being pinched! Lovely weather, great crab cakes for lunch, good guides and views of local fauna including a bald eagle.
Mary Wicksten, Texas A&M University

Book Review

Charbonnier, S., D. Audo, A. Garassino, and M. Hyžný. 2017. Fossil Crustacea of Lebanon. Mémoires du Muséum national d'Histoire naturelle, 210, Paris. 252 pages. Hardcover, ISBN: 978-2-85653-785-5. €69

Rodney M. Feldmann
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It is nearly impossible to visit a gift shop or a rock and mineral show without seeing fossil fish and shrimp from Lebanon on sale. Specimens of some of the taxa are both amazingly well preserved and extremely abundant. First noted by the Greeks in the 5th Century B.C., scientific examination of the fossils spans the last nearly 150 years. The literature is diffuse, often inadequately illustrated, and definitely in need of re-examination. *Fossil Crustacea of Lebanon* does just that by providing the current state of scientific work on the group in a carefully crafted, beautifuly illustrated monograph summarizing earlier work on crustaceans as well as describing 20 new species and 13 new genera. The work is based upon extensive European museum collections and several hundred specimens recently collected by a French team led by Charbonnier. The result is the recognition of 67 species of crustaceans, making this a necessary reference work for crustacean systematists.

The rocks from which the specimens were collected are Late Cretaceous (Santonian and Campanian) in age and are exposed in several quarries in western Lebanon. These quarries include Sahel Alma, of Santonian age, and Hakel, Hadjoula, and En Nammoura, of Campanian age. These quarries expose sublithographic to lithographic limestones that are similar in many ways to the famous Solnhofen limestones in southern Germany. The extremely fine-grained sediment encloses a vast number and variety of fossils preserved in such detail that the anatomy of hard and soft tissues of adults as well as some crustacean larval forms are preserved. The combination of the diversity of the fossils preserved and the apparent fine detail of their features qualifies the occurrences as a Konservat-Lagerstätten – accumulations of large numbers of exquisitely preserved, articulated fossils. It is interesting to note that, when one examines close, fine detail on specimens preserved in these settings, the fidelity of specimens is less than when viewed from a distance. Regardless, these Lebanese occurrences constitute an invaluable source of paleontological information bearing on the Late Cretaceous history of crustacean groups.

Although shrimp are the most numerous and speciose crustaceans in the quarries, anomurans, lobsters, crabs, stomatopods, isopods, barnacles, and lophogastrids are also represented. Charbonnier *et al.* describe this array of taxa in systematic treatments making it possible to not only use the work as the basis for identification of specimens but also to delve into the literature to gain an historical perspective on each of the taxa. Close examination of the detail of specimens that are illustrated suggests that some are overinterpreted, and that features indicated as diagnostic cannot be identified. Details of the location of type and figured specimens are noted so that future workers will have a firm starting point for their research.

Taken alone, this useful information would not necessarily set the work apart from other systematic paleontological works. What is special is the quality of illustrations and the care given to the historical perspective. Photographs taken in plain light and under ultraviolet illumination display many parts of the anatomy; however, in either case, some of the morphological detail is obscured by the tone of the specimen. The photographs are of suitable size and fine definition. It is unfortunate that at least some of the specimens were not coated in ammonium chloride and illuminated in low angle light to emphasize anatomical details more clearly. The specimens tend to be very low relief; however, low angle illumination would certainly enhance more of the surface features. Ultraviolet illumination clearly enhances some of the detail on some specimens but seems not to be useful on others. That said, the most impressive feature of the illustrations in their number, quality, and variety. Ranging from historical photographs and line drawings to modern illustrations, the figures clearly reveal the historical development of the concepts surrounding each of the taxa. Illustrating 67 taxa with over 500 photographs and drawings is almost unprecedented.

continues next page...

Book Review, continued from previous page...

In addition to the systematic paleontology, several other aspects of the work deserve mention. The introductory section presents a brief but quite informative history of study of the Lebanese decapods as well as notice of two of the most significant collections, the Muséum National d'Histoire naturelle, in Paris, and the Museo di Storia Naturale, in Milan. The geologic setting of the Cretaceous lagerstätten is clearly summarized and well illustrated, although the location map of the quarry sites is not particularly useful owing to the scale and lack of geographic details.

Also of note is the list of anatomical abbreviations and glossary of terms which serves as a helpful guide for those not familiar with crustacean anatomy and as a reference point for terminology used throughout the work. Most terms are appropriately abbreviated following "standard" usage and are well defined. Despite that, some strange uses creep in. For example, the term "cardiac stomach" is used (p. 129) which seems anatomically improbable and is undefined.

The list of references is extensive and the glossary is useful and comprehensive. The work is well produced, carefully edited, and attractively presented. It provides a significant work on a well known assemblage of fossil localities that have never before been compiled into a single work covering the entire known crustacean fauna of Lebanon. The print version is accompanied by an electronic version on a compact disc. As such, it is a necessary addition to a paleontological library.

Spot the crab!

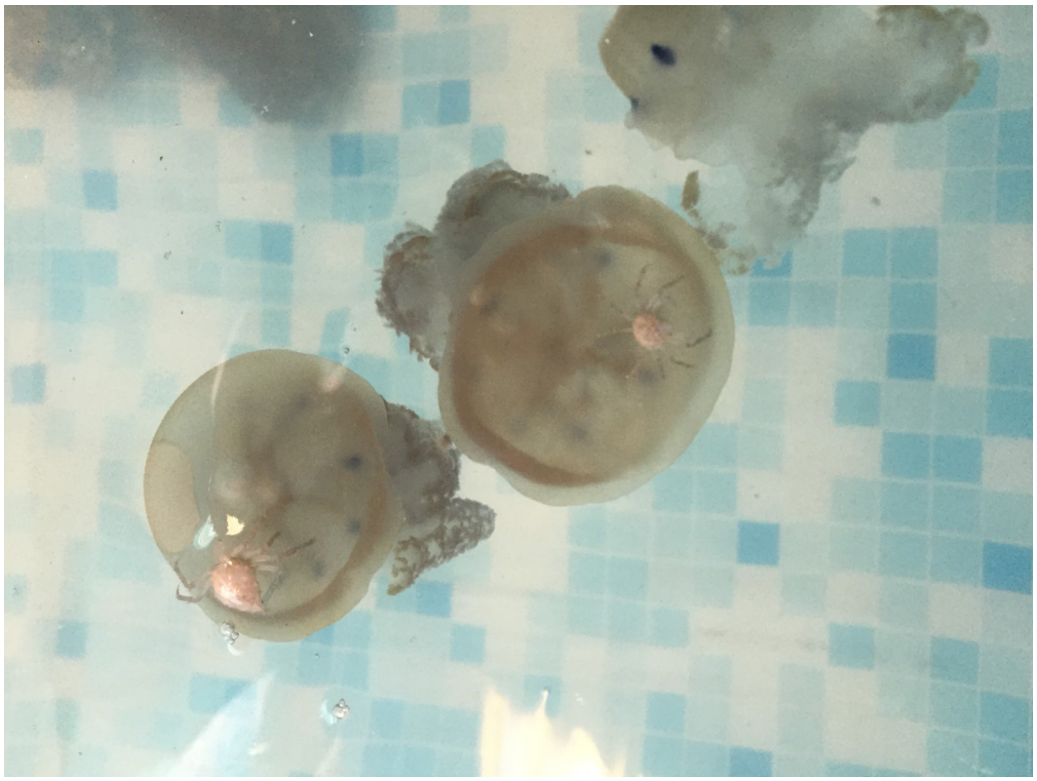


Photo by David M. Hudson (2018)

This photo was taken by David Hudson from the Maritime Aquarium at Norwalk (CT, USA) who took this photo while undertaking a recent field trip to Santa Marta—crabs on every jellyfish they were trying to cultivate.

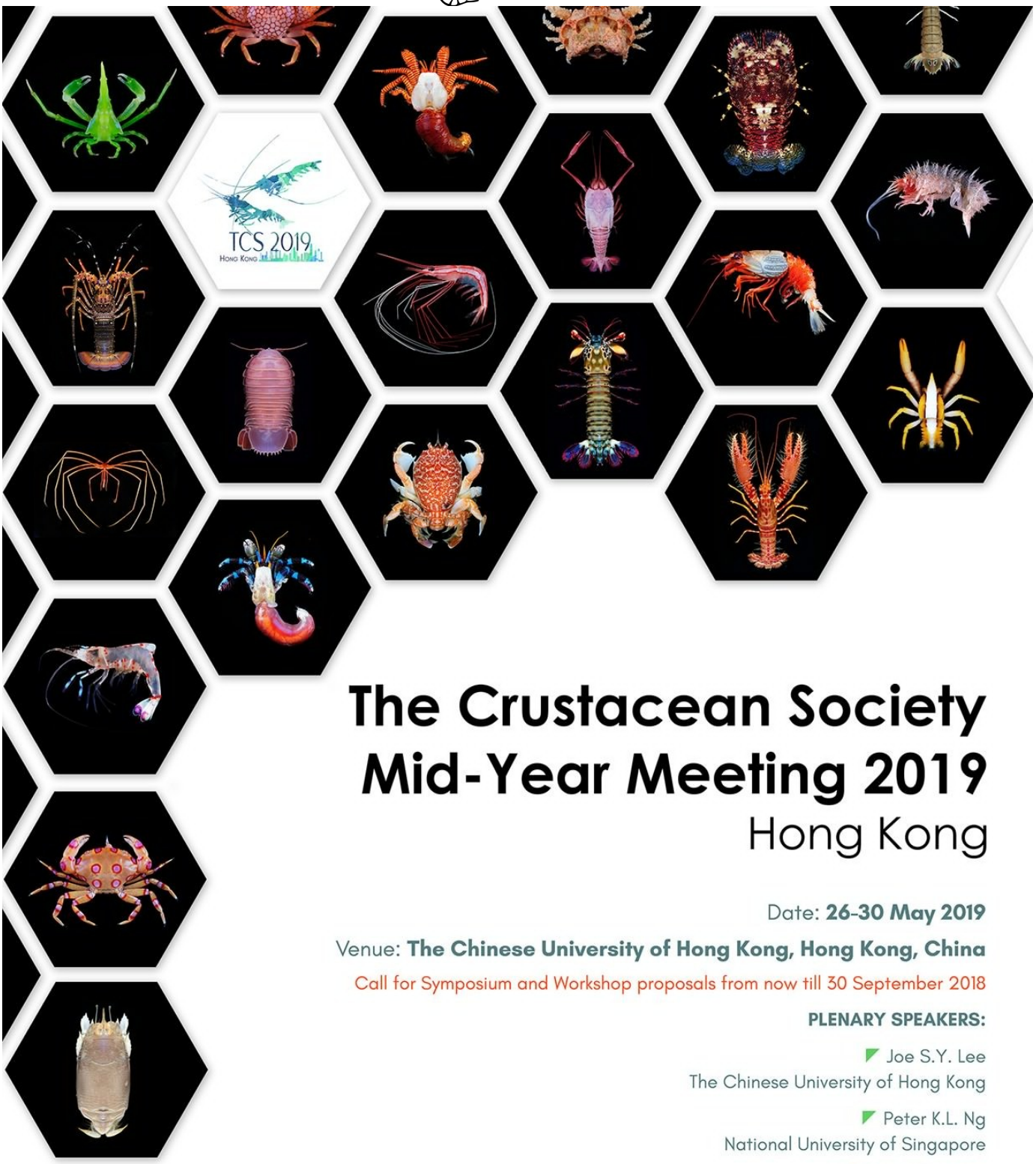
X CONGRESSO BRASILEIRO SOBRE CRUSTÁCEOS

On the behalf of the organizing committee of the Brazilian Crustaceans Congress, we would like to invite researchers, undergraduate and graduate students or other ones interested in the study of crustaceans, we are pleased to announce the X Brazilian Crustaceans Congress (X CBC). This edition will be organized by the Federal University of Pernambuco (UFPE), Federal Rural University of Pernambuco (UFRPE) and University of Pernambuco (UPE), and it will take place from November 11 to 14, 2018, at the Mar Hotel Conventions, in the city of Recife, State of Pernambuco. The organizing committee is strongly engaged with the preparation of a high-level programming, with the participation of Brazilian and foreign speakers, in order to provide important and deepened discussions on the most diverse aspects related to the crustaceans. The online registration is now opened, with promotional values up to June 10. Abstracts can be submitted in Portuguese, English and Spanish up to July 31. Each registration allows the submission of two abstracts. More detailed information can be found at the official website of the congress: https://xcbcrecife2018.wixsite.com/xcbc2018/inscricoes"

THE SOCIETY FOR INTEGRATIVE AND COMPARATIVE BIOLOGY

The Annual TCS and SICB Meeting
Jan 3-7, 2019
Tampa, Florida, USA

#SICB2019



The Crustacean Society Mid-Year Meeting 2019

Hong Kong

Date: **26-30 May 2019**

Venue: **The Chinese University of Hong Kong, Hong Kong, China**

Call for Symposium and Workshop proposals from now till 30 September 2018

PLENARY SPEAKERS:

- Joe S.Y. Lee
  The Chinese University of Hong Kong
- Peter K.L. Ng
  National University of Singapore
- Pei-Yuan Qian
  Hong Kong University of Science and Technology
- Jianhai Xiang
  Institute of Oceanology, Chinese Academy of Sciences

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Website: **http://tcs2019.net**