



The Ecdysiast

The Newsletter of The Crustacean Society

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Message from the President...

Dear TCS-colleagues,

Once again it seems necessary, or at least appropriate, to start this message addressing the COVID-19 pandemic situation. All of us have been hoping that we can return soon to our "lives-as-usual" or, probably more realistically, to a new post-COVID reality. Unfortunately, the situation is still complicated, with new and more aggressive infection waves in different parts of the world, which obviously also affects the development of our research activities. Many of us, for example, cannot conduct the field work as originally planned, universities and research laboratories have practically closed down their facilities to avoid infections, and we all have to be creative in order to overcome this situation and progress "somehow" with the objectives of our studies. But above all, our health has absolute priority

in these complicated times. I sincerely hope that you and your loved ones are healthy.

On a brighter side, our ***Journal of Crustacean Biology (JCB)*** is now online only. I completely understand that some colleagues will miss the enjoyment of reading the new issue of JCB as a printed version, but being online only has many advantages, especially for the authors submitting their contributions to JCB. In this Ecdysiast-issue, our Editor-in-Chief, Pedro Castro, explains some details about this change and highlights the advantages of this new format. Of course, we will closely monitor this process, but it is reasonable to assume that the readership will migrate more and more towards online journals.

The other exciting news is that we renewed the contract with the publisher of JCB, **Oxford University Press (OUP)**, from 2022 to 2026. Our collaboration with OUP has been quite successful, and one indication of that is the increasing impact factor of JCB. This of course, would not have been possible without our tireless Editor-in-Chief Pedro Castro and his extraordinary team of Associate Editors. However, the excellent collaboration with OUP certainly helped to promote our journal on an international level, which in turn resulted in a steady and increasing flow of incoming manuscripts. Therefore, we are happy to continue our partnership with OUP for another five years and sincerely hope that this collaboration will contribute to further increase both the impact factor and financial revenue. Our treasurer, Jason Williams, together with the other TCS Board members, will have a close look at these numbers.

There is something else to announce and celebrate: The **new TCS webpage** has been launched recently!! This is the result of the joint effort of the TCS-Executive Board, lead by our President-Elect, Benny Chan, in close collaboration with Jill Drupa and Amy Wride-Graney from our Business Office. It has been a rocky road with many small, big and sometimes unexpected problems, but now it is done! Thanks for the excellent work of everybody involved in this important project. Here is the link to our new webpage (<http://thecrustaceansociety.org/>), and now you are invited to explore it and send us your feedback (email Benny Chan: chankk@gate.sinica.edu.tw). We tried to include the valuable comments and suggestions received so far, but we



are aware that there are always details that might need to be addressed to make the webpage even more attractive and easier to use. In advance, thanks a lot for your constructive suggestions!

And speaking about the **TCS-Executive Board**, I just wanted to share with you that it is a pleasure, honor and a great privilege to work together with each one of them. To be honest, I am impressed not only by their enthusiasm, but also by the time and effort they are investing to support TCS's activities. Benny Chan, President-Elect, did an extraordinary job with the new webpage, which has been a complicated task, mainly due to administrative issues. Jason, our treasurer, is constantly monitoring the TCS numbers and always concerned not only about the budget, but also about any topic related to TCS. Christopher Rogers does a superb job as our Program Officer, constantly providing excellent and refreshing ideas about TCS's future activities. Our Secretary, Sarah Gerken, is responsible, among other things, for preparing the minutes of the different TCS-Board meetings, and she is also doing a great job. Finally, since JCB is our flagship, a frequently invited guest to these meetings is Pedro Castro, Editor-in Chief, whose plentiful experience is always appreciated.

The Treasurer's report revealed that **membership** numbers are currently well below the 337 total members we had in 2020. So please, check if you have renewed your membership for 2021. TCS needs your support, and if you have any questions, please do not hesitate to contact our Business Office (Email: tcs@burkinc.com).

Finally, I wish to congratulate Kareen Schnabel for the first issue she put together as Editor of Ecdysiast! She brought fresh ideas to our newsletter and that is exactly what it needs. Therefore, we sincerely hope that you like the new sections "Hot off the Press & Online Resources" and "Research Papers". In the case that you have ideas about what else should be included in the newsletter, please contact Kareen (Kareen.Schnabel@niwa.co.nz) and she will do her best to include your suggestions.

With appreciation,

Ingo Wehrmann.

President, The Crustacean Society



<http://thecrustaceansociety.org/>



Thank you to our benefactors

Consider becoming a TCS Patron Member where you support the membership of at least one other member/student. Thank you!

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Bernard Sainte-Marie
Carrie Schweitzer
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Roger Thoma
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Jose Luis Villalobos Hiriart
Les Watling





The Crustacean Society Board Members, 2021

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Universidad de Costa Rica, Costa Rica
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Benny Chan
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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:
Kareen Schnabel, kareen.schnabel@niwa.co.nz



The Crustacean Society Liaison Officers, 2021

The Chinese Crustacean Society

Liaison Officer: Jianhai Xiang
CAS Institute of Oceanology, China
email: jhxiang@qdio.ac.cn

International Association of Astacology

Liaison Officer: Tadashi Kawai
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The Brazilian Crustacean Society

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The Carcinological Society of Japan

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Seto Marine Biological Laboratory, Kyoto
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The World Association of Copepodologists

Liaison Officer: Rony J. Huys
Natural History Museum, London, UK
email: r.huys@nhm.ac.uk

International Research Group on Ostracoda

Liaison Officer: Renate Matzke-Karasz
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Latin American Carcinologist Association

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Colloquium Crustacea Decapoda Mediterranea Group

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Terrestrial Isopod Biologists Group

Liaison Officer: Jasna Strus
University of Ljubljana, Slovenia
email: jasna.strus@bf.uni-lj.si

Large Branchiopod Working Group

Liaison Officer: D. Christopher Rogers
University of Kansas, Kansas
email: branchiopod@gmail.com

Amphipod Group

Liaison Officer: Wim Vader
Tromsø Museum, Norway
email: wim.vader@uit.no

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@CrustaceanSoci2



Treasurer's Report for May 2021

As of April, TCS had 233 renewed members (183 regular members, 16 patron members, and 34 student members). We hope to match or exceed the 337 total members that we had in 2020 so check your membership status and renew if needed! Please also encourage your colleagues and students to join; particularly students since they are the future of TCS and can take advantage of our research and travel awards. Note that the link to join or renew memberships is: <https://scienceserv.com/tcs/membership/membership.php> and you can contact (mrobinson@burkinc.com) directly if you have any issues with payments. A copy of the membership form is provided at the end of this issue of the Ecdysiast in case you find that more convenient.

The Executive Committee of TCS (President Ingo Wehrtmann, President-Elect Benny Chan, Treasurer Jason Williams, Secretary Sarah Gerken, and Program Officer Christopher Rogers) as well as Peter Castro (Editor-in-Chief of JCB) reviewed the new contract with Oxford University Press (2022—2026) for the Journal of Crustacean Biology (JCB). After discussion and minor revisions, the contract has been accepted and we are happy to be working for another five years with OUP and look forward to continued growth in this partnership. The Executive Committee also approved a 3% increase in subscription prices and Article Processing Charges (APC) for JCB in 2022. The final annual accounting for JCB in 2020 showed an increase in subscription income over 2019 and profit share due to TCS was ~ US\$30K (with net income of about US\$18K for the Society). OUP has implemented keyword advertising in JCB which may also increase revenue in the future; the TCS Executive Committee will be monitoring this.

TCS investments are doing well, with our Schwab accounts totaling approximately US\$740K and our Main-Street Bank checking account at US\$45K. The 2021 budget (see last report) is expected to show a small surplus due to lack of travel and meeting expenses during the pandemic.

Respectfully submitted,

Jason Williams



Journal of Crustacean Biology

The first issue of the year 2021 has been published: Volume 41, Issue 1, March 2021 (<https://doi.org/10.1093/jcbiol/ruaa088>). Take a look at the interesting range of carcinological research on display.

ONLINE-ONLY PUBLICATION OF JOURNAL OF CRUSTACEAN BIOLOGY

Journal of Crustacean Biology will no longer be published in print starting with this first issue of Volume 41 (2021), members of The Crustacean Society (TCS) currently receiving print issues of the journal as part of membership subscriptions will have to access JCB online only from 2021. Oxford University Press (OUP) and TCS have taken this decision in the light of the extensive online usage of the journal. Thousands of libraries and individuals around the world access JCB online, and readers are able to access a more flexible and modern user interface, which has driven readership increasingly online. In contrast to printed issues, the online journal will provide immediate access to the most current articles at all times via Advance Access, access to further digital content such as supplementary data, enhanced figure display, reference-linking, and other article-level metrics. The online only publication is more environmentally friendly, eliminating the need for paper, shipping materials, and transportation, thus significantly reducing the journal's carbon footprint. Published content is available to readers instantly upon the day of publication, rather than after a delay as the content is assigned to issue, prepared for print, and dispatched. An additional advantage is that all figures will be published in color online free of charge to authors.

Please consider publishing in the JCB, remember that page charges (for the first 12 pages of the typeset article) are waived for TCS members.

Journal of Crustacean Biology

- Fast review process and decision time
- Premier journal on all aspects of crustacean biology
- High-quality and constructive peer review
- Variety of article submission options
- Online color figures published free of charge
- 2019 Journal Impact Factor: 1.254

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academic.oup.com/jcb






TCS Student awards presented at the 2021 SICB Meeting

The 2021 Society for Integrative and Comparative Biology meeting was a virtual meeting this January. As always there were plenty of excellent presentations. The Crustacean Society had some 22 students competing for the TCS student presentation awards: 11 were oral presentations and 11 poster presentations, representing 15 different universities and institutions from across the USA.

Both oral and poster presentations could receive a maximum of 100 points each. The judges awarded points based on set criteria. Each presentation was judged by three judges, and all scores were tallied by the Program Officer.

Oral presentations were judged on the following criteria: originality (up to 10 points), hypothesis/objectives (20 points), experimental design (10 points), implementation (10 points), validity of conclusions (20 points), graphic quality (10 points), oral clarity for content (10 points), and answers to questions (10 points).

Poster presentations were judged on the following criteria: abstract (up to five points), originality (10 points), hypothesis/objectives (20 points), experimental design (10 points), implementation (10 points), validity of conclusions (20 points), graphic quality (10 points), answers to questions (10 points), quality of writing (10 points), and bibliography (5 points).

The winners were:

Best Oral Presentation: Emily Branham (photo), graduate student, Swarthmore College. Title: “Biomechanical role of dorsal thoracic spine in swimming of barnacle nauplii”. Sponsor: Dr. Kit Yu Karen Chan.



First runner-up (oral): Cory Berger, graduate student, Woods Hole Oceanographic Institution. Title: “Conserved molecular responses to starvation in two Southern Ocean copepods”. Sponsor: Dr. Ann Tarrant.

Second runner-up (oral): Marisa McDonald, graduate student, University of Hawai'i at Manoa.

Title: “Visual physiology of larval stomatopod crustaceans”. Sponsor: Dr. Megan Porter.

Best Poster Presentation: Vanessa Bentley (photo), graduate student, Colorado State University. Title:

“The Crustacean juvenile hormone: Characterization of the methyl farnesoate signaling genes in the *Gecarcinus lateralis* Y-organ transcriptome”. Sponsor: Dr. Donald Mykles.



First runner-up (poster): Antonia Bock, undergraduate student, University of California, San Diego. Title: “Hatching delays in extreme salinities in the intertidal copepod *Tigriopus californicus*”. Sponsor: Dr. Ronald Burton.

Second runner-up (poster): Camilla Piechocki, graduate student, Colorado State University. Title: “Insufferable bookworms and their crabby victims: quantifying the infection intensity of flatworms on horseshoe crab book gills”. Sponsor: Dr. Bassem Allam.

All the students did very well, and we were pleased that they shared their research with us. I want to congratulate all our winners; you did well!! I want to thank all the students who participated, their sponsors, and especially the six judges who helped determine the winners.

TCS Program Officer, D. Christopher Rogers



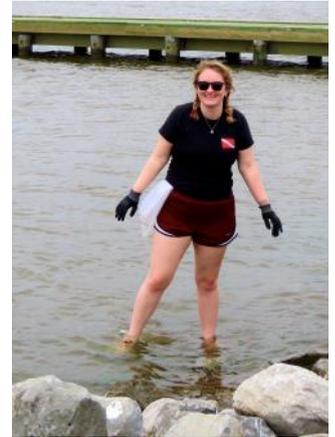
TCS Student and early career researcher awards for 2021

We announce here the winners of the 2021 The Crustacean Society student and early career awards. This first set were selected in April (please note that the travel awards are offered twice per year). The Crustacean Society provides a wide range of grants and scholarships for students and postdoctoral researchers, and we really encourage all who are eligible to apply (please visit the TCS website for more details).

TCS Fellowship in Graduate Studies

TCS annually awards up to six US\$1,000 Fellowships in Graduate Studies in any research concerned with the biology of crustaceans. The fellowship is to support the research objectives and career goals of graduate students. This award requires a letter of support from their faculty sponsor/TCS mentor. Both the student and their faculty sponsor/TCS mentor must be a TCS member at the time of application. Further details and requirements are in the application (see website). The deadline for application is 31 March annually.

Our winner for 2021 is **Darby Leana Pochtar**, a doctoral student at George Mason University, USA. She is sponsored and mentored by Dr. Amy Fowler. Darby's study title is; 'Do zombies eat less and get eaten more? The effects of castrating parasites on a host crab's diet and predation risk'



TCS Early-Career/Post-PhD Travel Awards

TCS annually awards up to three US\$1,500 travel grants for early-career Ph.D. researchers. The Ph.D. must have been awarded within five years of the application deadline. Extension of up to eight 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 cover travel to give a presentation, preferably oral, at a TCS meeting (SICB, Mid-Year, or ICC) on the results of their research in any field of study involving crustaceans. Applications that result in a manuscript suitable for publication in the Journal of Crustacean Biology are given preference. The deadline for application is 15 March and 15 September annually (see TCS website for more details).

Our winner for 2021 is **Dr. Prema Mani**, who is a research fellow at the Crustaceans Research Lab, Centre of Advanced Study in Marine Biology, Annamalai University, India, and she was sponsored by former TCS president Dr. Jeffrey Shields. Prema tells us that her major research interest is in taxonomy, phylogenetics and inventory in the 'biodiversity of decapods', specifically the Crustacea of Indian coastal waters including mangrove habitats. She plans on presenting at the next in person TCS or SICB meeting her research entitled: "Comparative study of the gastric teeth of mangrove crabs Sesarmiidae (Brachyura: Decapoda) concerning phylogeny and morphological traits difference between herbivore, carnivore and detritivore"



TCS Student Travel Awards

TCS awards a maximum of five (5) US\$500 awards twice a year to support student attendance at TCS meetings (TCS mid-year/ICC and SICB). Applicants must be enrolled in an undergraduate or graduate degree program, be the presenter of an oral or poster presentation at the TCS/ICC/SICB meeting they attend, and demonstrate financial need for TCS support of travel to the meeting. Both the student and their faculty sponsor/mentor must be a TCS member at the time of the application. The deadline for application is 15 March and 15 September annually (see TCS website for more details).

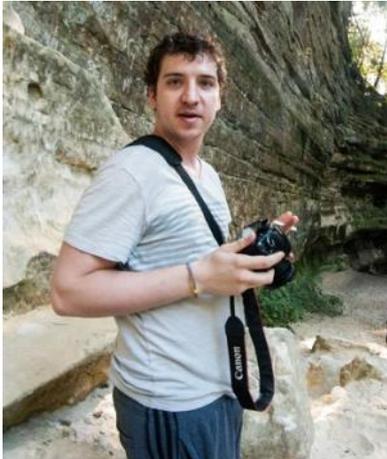


Our winners for 2021 are:

- **Brooke Bogan**, a masters student at State University of New York Fredonia, USA. She is sponsored and mentored by Dr. Thomas Hegna. Darby's study title is; 'A new method of morphometric analysis for extant and extinct Notostracans (Branchiopoda)'. Brooke tells us that she is currently finishing the first year of her Master's degree. Her work involves studying morphological variation within the order Notostraca (class: Branchiopoda) with emphasis on the fossil record. The goal of her current research is to use statistics to model and analyze shape change and variation within and among different constituent species.


- **Sisamu Baepi**, a masters student at the Namibia University of Science and Technology, Namibia. He is sponsored by Dr. Martin Schwentner (Naturhistorisches Museum Wien, Austria), and his research project '*Phylogeography of Namibian large Branchiopoda*' is on the phylogeography of Anostraca (fairy shrimps) in temporary pools of Namibia using DNA sequencing data from COI and 28S marker. Phylogeography will be done on selected species, this also can uncover species diversity and possible new species. Anostraca will be collected during rainy seasons from temporary pools across the country and some will be hatched from soil samples during dry seasons. Phylogeography studies on branchiopods have not been done before in Namibia and this will be the first ever.


- **Timothy Cronin** is matriculated at Clemson University, USA, as a doctoral student, and is sponsored by Dr. J. Antonio Baeza, who is also an Associate Editor for the Journal of Crustacean Biology. Timothy's study is entitled: '*Sexual conflict and unconventional sexual strategies: do protandric simultaneous hermaphrodites experience sexual conflict?*' Timothy's dissertation research primarily focuses on sexual conflict within protandric simultaneous hermaphrodites, specifically shrimp of the genus *Lysmata*. With the funding from this fellowship, he will compare the costs of copulation incurred by both male and female-role *Lysmata* sp. to determine whether sexual conflict is occurring in multiple species of these shrimps. Due to the various mating strategies present in species of *Lysmata* (e.g. social monogamy and pure-search polygamy) the effect mating strategies have on sexual conflict will also be explored. In addition to these studies, Timothy has recently began working in mitochondrial genomics and transcriptomics with the hope of applying these ideas in further chapters of his dissertation.



I want to congratulate all our winners: you did well!! I want to thank all the students who participated, their sponsors, and especially the judges who helped determine the winners.

TCS Program Officer, D. Christopher Rogers



Funding opportunities & Announcements

TCS Early-career, post-Ph.D. Travel Awards

TCS annually awards up to three (3) US\$1,500 travel awards for early-career researchers with a Ph.D. awarded within five years of the application deadline. Extension of up to eight 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 SCIB meeting). Preference will be given to applications that will result in a manuscript suitable for publication in *Journal of Crustacean Biology*. Deadlines: 15 March and 15 September annually. The application can be downloaded [here](#).

TCS Student Travel Awards

TCS awards a maximum of five (5) US\$500 awards twice a year to support student attendance at TCS meetings (TCS mid-year/ICC and SICB). Applicants must be enrolled in an undergraduate or graduate degree program, be the presenter of an oral or poster presentation at the TCS/ICC/SICB meeting they attend, and demonstrate financial need for TCS support of travel to the meeting. Both the student and their faculty sponsor/mentor must be a TCS member at the time of the application. The application can be downloaded [here](#)

For additional information contact the TCS Program Officer: Dr. D. Christopher Roger branchiopod@gmail.com, +1 (785) 864-1714



The Explorers Club has recently partnered with Discovery to offer expedition grants for researchers and explorers from around the world. Applicants do not need to be members or fellows of TEC to apply, and the grant will fund a variety of fieldwork. From the grant description: "Fieldwork in the following disciplines will be considered: Biological sciences, archaeology, anthropology, paleontology, earth sciences, ecology, and astronomy, as well as exploratory projects that reveal new knowledge about the planet and its inhabitants, including regions undergoing environmental or cultural change."

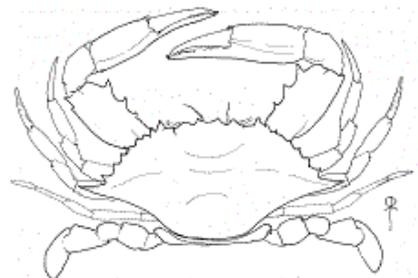
<https://explorers.org/about/explorers-club-discovery-expedition-grants>



Marawa Research and Exploration Ltd. offers two (2) undergraduate scholarships to Developing States candidates with an interest in the deepsea minerals industry. Based at the University of the South Pacific (Fiji) [\(deadline 5th July\)](#)

CRUST-L@VIMS.EDU, the Discussion List for Crustacea

CRUST-L@VIMS.EDU is the email listserver for those interested in Crustacea. CRUST-L is an unmoderated open list, but you have to be a member to post messages to it. It has around 850 members! You can subscribe or unsubscribe to the list by following the links below. Use CRUST-L@VIMS.EDU to post messages to CRUST-L. The sympa software includes several features such as searchable archives, and a digest mode for intermittent mailings. If you have trouble with your subscription or settings, send a help request to jeff@vims.edu.



How to subscribe to list: <https://lists.vims.edu/www/help/user#subscribe>

How to unsubscribe from list: <https://lists.vims.edu/www/help/user#unsubscribe>



Upcoming meetings



3–7 January 2022: SICB annual meeting, Phoenix, AZ, USA



CONGRESSO BRASILEIRO SOBRE CRUSTÁCEOS (CBC)
THE CRUSTACEAN SOCIETY (TCS) - SUMMER MEETING

Theme: Tradition and innovation: Integrative approaches to crustacean studies

For further information, visit the website <https://cbc-tcs.com/>

23rd Symposium of the International Association of Astacology

Hluboká nad Vltavou
Czech Republic



June 20 - 26, 2022

Early registration	till March 31, 2022
Regular registration	till April 30, 2022
Late registration	till May 31, 2022
Abstract of submission	till April 15, 2022

For further information, visit the event website <https://iaa23.com/cs/>.



3–7 January 2023: SICB annual meeting, Austin, TX, USA



In May 2023 the ICC10, the 10th International Crustacean Congress, will bring together carcinologists at the National Museum of New Zealand Te Papa Tongarewa in Wellington.

Check out this [video](#) to see what you can expect when you come to New Zealand! [Express your interest now.](#)

ICC10 Organising Committee

Rachael Peart
NIWA, co-host

Kareen Schnabel
NIWA, co-host

Shane Ahyong
Australian Museum

Graham Fenwick
NIWA

Diana Macpherson
NIWA

Andrew Hosie
Western Australian Museum

Kelly Merrin
Monash University

Rick Webber
National Museum of New Zealand Te Papa Tongarewa

Love [#carcinology](#)? Help us share! Full details of the [#ICC10 2023](#) Congress here: www.ICC10.org [#crustacea](#) [#newzealand](#)

Conference Organisers

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Conference Manager
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Obituaries

We remember our colleagues who we lost recently with gratitude for their contributions to crustacean research and to our community.

Marilyn Jean Schotte (1947—2020)

Growing up in Southern Oregon with camping trips, hikes, and having the ocean, river and woods to explore, Marilyn developed an early passion for biology. After graduating from Grants Pass High School, Marilyn achieved a degree from Antioch College in Ohio. The next four years were spent teaching international students in the Netherlands and Switzerland. When Marilyn returned to the U.S., she completed her graduate studies in environmental science at Cornell University in New York, adding to her passion for scientific insight. Her natural artistic abilities also gave her the additional skills as a scientific illustrator.

An assignment in the Florida Keys became her first adventure into the world of marine research. That was followed by a job with the Smithsonian's National Museum of Natural History, where for most of her career she was research assistant for Dr. Brian Kensley 1980–2004), and then Dr. Ellen Strong (2004–2009). Marilyn retired in 2009 after nearly 30 years of service from her position as a Museum Specialist in the Department of Invertebrate Zoology. A scientist in her own right, she was a very active carcinologist, authoring 40 papers and a book, describing 5 genera and 126 species of isopods, stomatopods, copepods, and shrimp. She participated in many field collecting expeditions to enrich the Museum crustacean collections, maintained the World List of Marine, Freshwater, and Terrestrial Isopods and served in leadership roles in the Biological Society of Washington and the Guild of Natural Science Illustrators. She was well regarded in the carcinological community, and well known to give freely and unselfishly of her time to assist others on technical aspects of isopods and other crustaceans. After her retirement, Marilyn was a NMNH Research Collaborator for several years before eventually relocating to Oregon.



Marilyn passed away September 8th, 2020 in Eugene, Oregon. She is survived by her husband of 22 years, David Mendoza, and sisters Shirley Hill, Sharon Goin, and Marlene Schotte, and six nieces and nephews.

(Adapted from Musgroves Mortuaries & Cemeteries obituary)

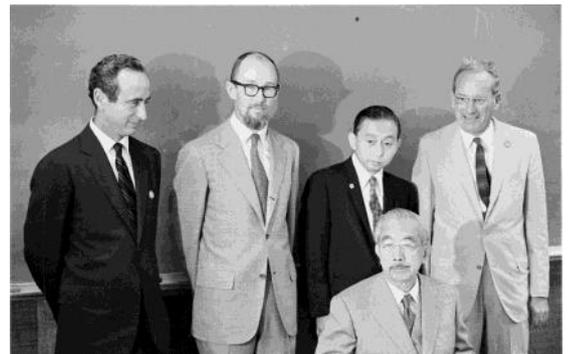
Robert R. Hessler (1932—2020)

This is a sad year indeed, Robert R. (Bob) Hessler passed away, shortly before his friend and colleague Bill Newman, on October 17th in Douglas Arizona, near his desert retreat at Portal, Arizona. An obituary notice for Bob Hessler can be found on the SIO website (<https://scripps.ucsd.edu/news/obituary-notice-deep-ocean-scientist-robert-hessler>). Bob was famous for his work in deep-sea ecology but produced many seminal works on crustacean systematics and functional anatomy, including especially on Cephalocarida and Mystacocarida.

Bob Hessler and Bill Newman were close colleagues in the Marine Biology Division at the Scripps Institution of Oceanography. They looked after each other, despite their differences of opinion, and together trained many students of crustacean biology and on many other aspects of marine biology and biological oceanography. They both were on my thesis committee; I will always be grateful for their support during my years at SIO. After Bob retired from SIO, Bill was first on my SIO visit list whenever I was in San Diego. Kathy and I would find him, as always, writing at his computer on one barnacle project or another. Bill was always kind to us and he will be sorely missed. Several of us are working on an obituary for Crustaceana.

—Buz Wilson

(Image caption: Emperor Hirohito of Japan seated at desk, visiting a marine biology laboratory at Scripps Institution of Oceanography in 1975. Behind Hirohito on left, Bill Newman and Bob Hessler, <https://library.ucsd.edu/dc/object/bb1707788j>





Vassily A. Spiridonov (1957–2020)

With great sadness, we have to announce the passing of carcinologist, marine ecologist and conservationist Dr. Vassily Albertovich Spiridonov. He was born on April, 7th 1957 near Murmansk in the very North of Russia, where his father served as a navy officer. Being born north of the polar circle and having a family tradition to go to sea, obviously had a great influence on him. He loved the polar regions as much as the ocean and participated in 10 ship-based expeditions to the Arctic and Antarctic.

After studying in Kazan and Moscow, he worked in the Laboratory of Antarctic Resources of the All Union Research Institute of Fishery and Oceanography. In 1988 he defended his PhD dissertation on Antarctic krill and started to work at the Zoological Museum of Moscow University in 1990, where he became head of the Invertebrate Zoology division. Here his scientific interest broadened and besides his research on Antarctic Euphausiacea, he started to publish on decapod crustacean systematics. In the 1990s he also developed close scientific ties to Germany, and especially to the Alfred Wegener Institute (AWI) in Bremerhaven, where he lived for more than one year with his family (1994-1995) and the Senckenberg Research Institute in Frankfurt, where he mainly worked with the late Prof. Dr. Michael Türkay.

From 2001 on, Vassily moved into the fields of coastal ecosystem ecology, conservation and sustainable fisheries, working as Advisor for WWF Russia. In 2005 he became senior, and 2018 leading Researcher at the Laboratory of coastal ecosystems of the P.P. Shirshov Institute for Oceanology. In addition, he was advisor for a large GEF/UNDP project, worked as a consultant for the Marine Stewardship Council Russia and the FAO and joined working groups within the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) and the Convention on Biological Diversity (CBD).

Besides all these tasks, Vassily was always working on new scientific projects and publications in the fields of marine ecology, carcinology, especially portunid crab systematics, biological invasions and many more. In total, he published more than 170 scientific articles and abstracts, but also numerous popular papers, reports and other publications. He was lecturer at the Lomonosov Moscow University, edited scientific and popular publications and was editorial board member of several scientific journals.

Many of us knew Vassily, since he was always eager to collaborate with colleagues all over the globe. We first met in 1997, when we worked on the Portunidae of the Arabian Gulf and from then on we had several joint projects, but most of all became good friends. He was an incredibly kind, open-minded and broadly educated person and I will never forget the good conversations, scientific discussions and shared experiences we had over the years. Unbelievably for all of us, but especially for his wife and his two daughters, Vassily was torn out of life all of a sudden by a Covid-19 infection and died on December 17th 2020 in a Moscow hospital.



—Michael Apel

William Anderson Newman (1927–2020)

William (Bill) Newman, a marine biologist and renowned authority on barnacles and seafloor invertebrates at Scripps Institution of Oceanography at University of California, San Diego died on December 26th 2020 at his home in La Jolla, California. He was 93.

Bill's contribution in marine biology is extensive, but it is for his work on barnacles that he will be most remembered. Indeed, he has made a greater contribution to cirripedology than anyone since Charles Darwin.

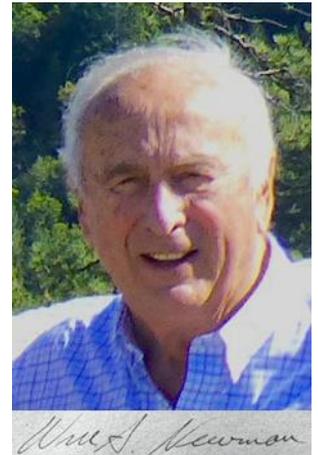
Bill's fascination with barnacles (cirripedes) began in 1960 when as a graduate student, he ordered a lobster at the famed Spenger's Fish Grotto in Berkeley, California. Clinging to the gills of his lobster was a small stalked barnacle. Bill was inspired by the tenacity of the little critter, and went on to identify it. His future direction was now set, and during the next six decades, he described more than 80 new barnacle species, complimented by profoundly thoughtful insights into the evolutionary history and biogeography of the Cirripedia.



Bill was born in San Francisco on November 13th, 1927, where he spent much of his youth fishing and sailing. He served in the US Army for two years at the end of World War II, after which he read zoology at the University of California, Berkeley. Bill completed his doctoral thesis *Adaptive behavior and physiology of estuarine barnacles* in 1962, and that year joined Scripps Institute of Oceanography as Assistant Professor of Biological Oceanography. Shortly after his appointment at Scripps, he moved to Harvard for two years as Assistant Curator of Marine Invertebrates. However, the call of California's climate and beaches was strong and he returned to Scripps in 1965 as Curator of Benthic Invertebrates. Later that decade Bill was appointed lead author in the prestigious *Treatise of Invertebrate Paleontology*, writing the chapter on Cirripedia (1969), that remains an important resource, cementing Bill's stature in barnacle biology and evolution. Over the next 50 years, he continued his ground-breaking research in barnacle phylogeny and distribution, one example of which was his insightful assessment of the barnacles of deep-sea ocean ridges – which he showed to be “glimpses of antiquity”. Of his monographs, the 1971 work, with the late Arnold Ross on Antarctic barnacles, is the definitive text on the southern ocean cirripedes, and the 1976 *Revision of the balanomorph barnacles*, also co-authored by Arnold Ross, remains the “go to” reference for acorn barnacles.

Bill worked at Scripps until retirement in 2006, after which he continued as Professor Emeritus. He was an active researcher until his last days and importantly, he increasingly interacted with other colleagues and emerging scientists. It is through his generosity of spirit, his wide understanding of global systems, and his willingness to involve others in his innovative research programmes that he will be fondly remembered. “Bill was one of the last working survivors of the Golden Age of Zoology,” said Scripps marine biologist Nicholas Holland. “I have never recognized very many heroes – and now, one fewer.”

Bill Newman is survived by wife Lynn of La Jolla, California, sister Barbara Newman Witter of San Francisco, sons William Newman of Atascadero, California, James Newman of Pacific Grove, California, daughter Doris Newman Horton of Kirkwood, Missouri., son Eric Newman of Viroqua, Wisconsin, stepson Scott Kennedy of Lake Arrowhead, California, and 12 grandchildren.



A comprehensive Bill Newman obituary is published in *Proceedings of the California Academy of Sciences Ser. 4.*, 67(3): 55–83.

— John Buckeridge

Nguyen Ngoc-Ho (1936—2020)

Born in Hue, Vietnam, 1936, Ho received a Bachelor' degree (*licence*) in Natural Sciences from the University of Saigon, Vietnam in 1957. She received a Doctorate in Biological Oceanography from the University of Aix-Marseille, France, 1975 with a thesis on larval development of three Indo-West Pacific species of decapods. For her Ph.D. in Zoology at University of Reading, UK, 1979, she conducted her thesis research at the British Museum, London. The thesis was titled: ‘Studies on Decapod Crustacea with special reference to *Upogebia* spp., *Porcellana platycheles* (Pennant) and *Galathea squamifera* Leach’.

“I shared a room with Ho in the Old Spirit Building, NHM, while she was studying for her PhD and registered at Reading University. I do not know the circumstances or how Ho came to the UK to study for a PhD. Ray Ingle was one of her supervisors and the Reading University connection may be that Ray studied part time for his PhD at Reading. During Ho's stay in London, South Vietnam was defeated by the North. This caused visa problems for Ho because once her studies were finished she was not allowed to remain in the UK. So she left for Paris where she had a sister. Alain Crosnier found ORSTOM funds to support Ho until she managed to secure a full time position at the Museum.”



— Paul Clark

Ho was an Associate on animal biology, University of Nancy, France (1979-1985), a Researcher (1986-1988), lectu-



rer (*maître de Conférences*) (1989-2001) and an honorary researcher (2001-2012) at the Laboratoire de Zoologie Arthropodes, Muséum d'Histoire naturelle, Paris

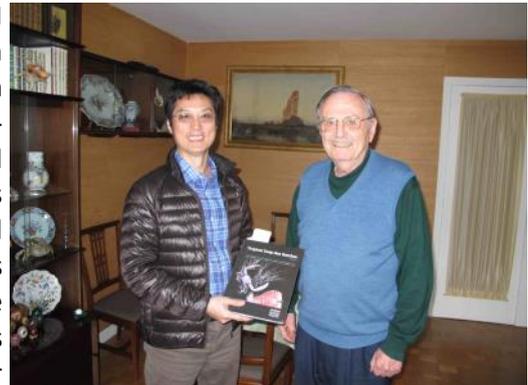
"I first met her in 1990. I remember her as a quiet and generous colleague during my many visits to Paris. She kept much to herself in the small room that she occupied next to the visitors' lab but was always ready to answer questions and share the findings of her research. She always showed a lot of interest in my research and in my family. Her contribution to understanding of Upogebiidae was second to none. She shared this interest with Michele de Saint Laurent but as far as I can tell they published only two papers together. "

—Gary Poore

Alain Crosnier (1930—2021)

Our dear colleague Alain Crosnier passed away in his 91st year on Feb. 18, 2021. He was internationally renowned for his scientific accomplishments, his skills as an organizer, and his boundless energy. His vision impacted generations of researchers, far beyond crustacean specialists, and he will be remembered as a demanding but generous and fair person.

He graduated as an agronomist and joined in 1956 what was then ORSTOM (Office de la Recherche Scientifique et Technique Outre-Mer). His first assignment was in Madagascar; then, from 1962 to 1968, at the ORSTOM branch in Pointe Noire, in Congo; and again in Nosy Be, in Madagascar, where he was head of the local ORSTOM branch from 1970 to 1976. There, he conducted surveys aimed at developing fisheries, with emphasis on shrimps, and explored offshore to depths of 1,000 meters, discovering new resources as well as new species. During those happy years, he authored or co-authored several major revisionary works, among others *Les crevettes profondes de l'Atlantique orientale tropicale* (in the series *Faune tropicale*; 1973) and three volumes on crabs (1962, 1965) and shrimps (1978) in the *Faune de Madagascar* series - a demonstration of his interests and skills for both fisheries resources and taxonomy.



(Alain Crosnier with Tin-Yam Chan in 2013)

After Madagascar, he was called by Guy Camus, then Director General, to become the head of oceanography in the ORSTOM Board of Directors in Paris, where he was at the forefront of French marine research. As such, he decided in 1976 that the RV *Vauban* would make a detour via the Philippines en route to its new assignment in New Caledonia. The goal was to collect new specimens of the (now famous) "living fossil" *Neoglypheia inopinata* that MNHN's Michèle de Saint-Laurent and Jacques Forest had "discovered" the previous year after 60 years on the shelves of the Smithsonian Institution, in Washington. The acronym "MUSORSTOM" was born, and this first "MUSORSTOM cruise" was phenomenally successful. Upon retirement from Institut de Recherche pour le Développement (IRD, the continuation of ORSTOM), Alain Crosnier started a second career in the National Museum of Natural History (MNHN), now focused on crustaceans and the exploration of the deep-water benthos of tropical seas. He was Principal Investigator of few, but the broker of many, and deployed vision and energy to organize the study of the specimens collected - by bringing to Paris specialists from all over the world as visiting curators - and to publish the resulting papers. In 1999, the "MUSORSTOM cruises" became Tropical Deep-Sea Benthos, and in 2016 the program celebrated its 40th anniversary; volumes 33 and 34 of results are currently in production, and hundreds more articles in marine biology or taxonomy journals have been published by collaborating zoologists, resulting in the description of over 3,500 new species. Sponges, echinoderms, brachiopods, bryozoans, stylasterids, scleractinians and fishes have all been covered at one time or another, although the emphasis has been on crustaceans and molluscs. The network of taxonomists that he initiated has members in 24 countries, and many like to call each other Crosnier's cronies. Undoubtedly,



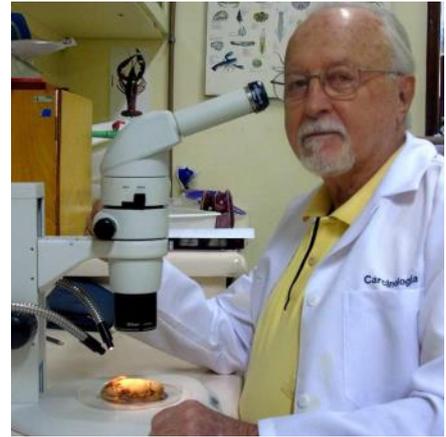
ORSTOM and later IRD, and MNHN owe him a lot for their image abroad. The impact of his legacy cannot be overstated.

Taxonomists have the habit of honouring their peers and mentors by naming new genera and species after them. In this respect, the list of those who have paid homage to Alain Crosnier reads like a Who's Who in modern marine invertebrate systematics. The genera *Alainius*, *Alainopagurus*, *Crosniera*, *Crosnierella*, *Crosnierita*, *Crosnierius*, and over 130 species have been named after him, in a combination of fondness, respect and admiration. The most recent, *Alpheus alaincrosnieri*, was published just a few months ago and certainly won't be the last.

—Bertrand Richer de Forges and Philippe Bouchet

Ludwig Buckup (1932—2021)

(Universidade Federal do Rio Grande do Sul - UFRGS, Porto Alegre, Brazil) – Bachelor in Natural History and a PhD in Zoology, joined at UFRGS as a Professor and retired in 1990, but kept continuously active supervising and inspiring several students in numerous research that covered mainly the Parastacidae and Aeglidae families. His engagement in environmental causes, inside and outside the University, focused the environment and conservation. His career is highlighted by important steps for the construction of academic spaces and the development and consolidation of the Brazilian Carcinology, in particular for the Brazilian Crustacean Society as president and member of the Council. He passed on away on February 22nd 2021.



—Fernando Mantelatto

Georgina Bond-Buckup (1949—2021)

(Universidade Federal do Rio Grande do Sul - UFRGS, Porto Alegre, Brazil) – biologist, master in Ecology and PhD in Zoology, dedicated her academic and scientific life to studies on Taxonomy, Systematics, Phylogeny, Ecology and Biology of Crustaceans from continental waters, especially with Aeglidae, Parastacidae, Palaemonidae and Amphipoda - Hyaellidae. Retired since 2003, remained active and his energy devoted to research, education and life has always been inspiring for many students. During the past years, her efforts have broadened knowledge about the taxonomy of the genus *Aegla*, making it one of the international references on the taxon. She also devoted much of her time to strengthening the Brazilian Society of Carcinology and projects on the conservation and preservation of Brazilian biodiversity. She passed away on April 27th 2021.



—Fernando Mantelatto

We will remember them



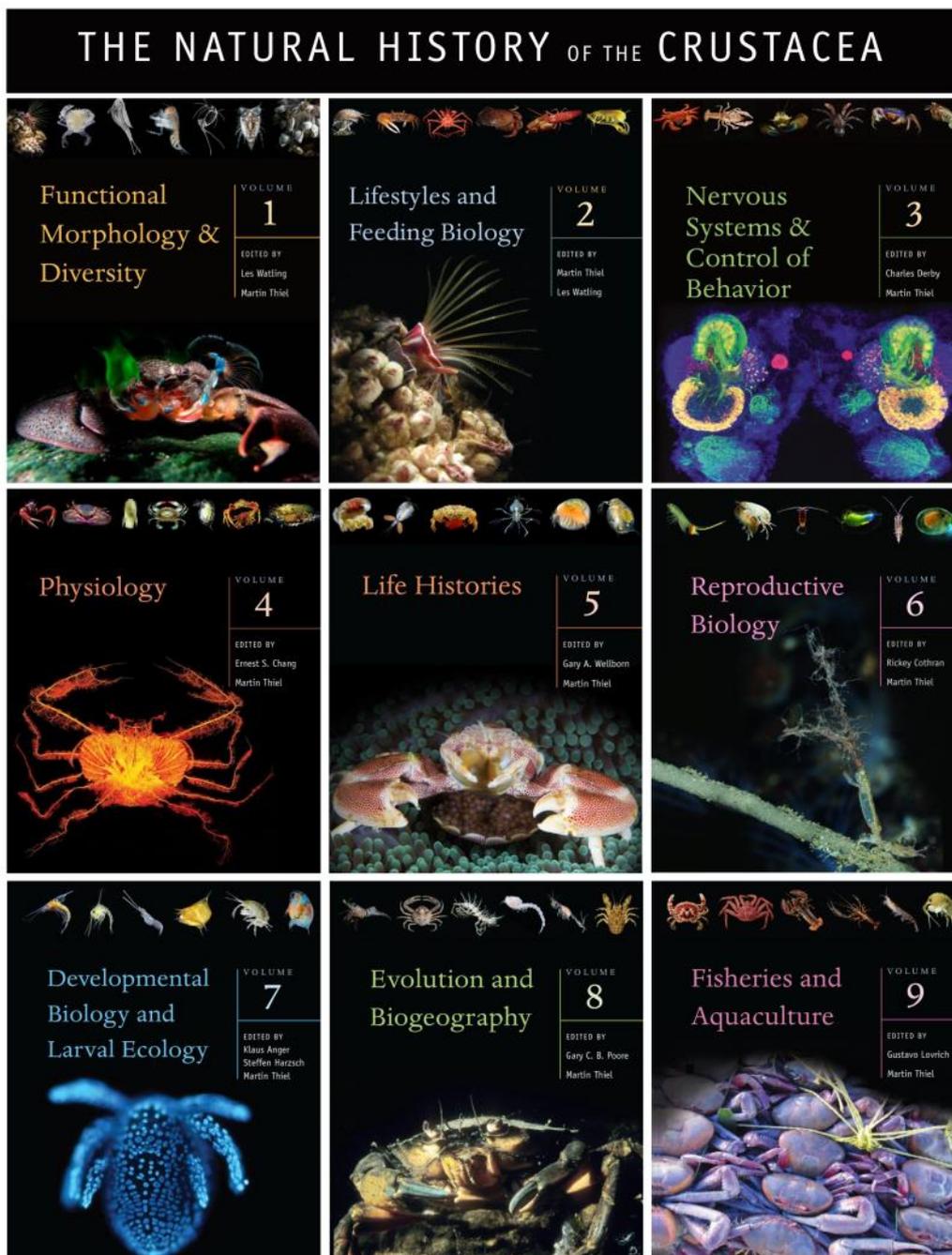
Hot off the press & Online resources

The Natural History of the Crustacea (volumes 1—9 published)

The year 2020 saw the release of volumes 6–9 of The Natural History of the Crustacea by Oxford University Press, and now the final volume on ecology and conservation is in progress.

Vol.6 synthesizes the reproductive biology; Vol.7 explores the developmental biology and larval ecology; Vol.8 research their evolution and biogeography; Vol.9 focus on fisheries and aquaculture. All the chapters have been written by leading experts, providing essential data on these fascinating crustacean topics. The series will be of great value to everyone interested to learn about crustaceans. To access the full list of NHC series, please follow this link:

<https://global.oup.com/academic/content/series/n/natural-history-of-crustacea-nhc/?lang=en&cc=c>





CrustyBase

<https://crustybase.org/>

CrustyBase is a repository and analysis suite for crustacean transcriptome data. Each dataset describes the activity of every expressed gene in a particular species, across a set of samples. Find new datasets with the Data Browser, then use the BLAST tool to find specific sequences within them.

We would like you to contribute your data

If you have access to crustacean transcriptomes, why not share them with the world?

We allow two levels of data access, so you can even share data without exposing the raw data needed for publishing. We hope that this will enable more collaboration and prevent researchers from missing out on data that would have enabled discoveries.

Contact: Cameron Hyde (chyde@neoformit.com) or Tomer Ventura (tventura@usc.edu.au) with any queries.



5th World Conference
on Marine Biodiversity
AUCKLAND | 13-16 DECEMBER 2020

WCMB early career panel discussions published

The World Conference on Marine Biodiversity Early Career Committee has published its summaries of its two panel discussions on PeerJ with words of wisdom from world leaders in marine biodiversity sciences, including DOSI Climate Change working group leads, Moriaki Yasuhara and Lisa Levin:

[Navigating paths through science as early career researchers: A WCMB panel discussion](https://peerj.com/blog/post/115284883714/navigating-paths-ecr/)

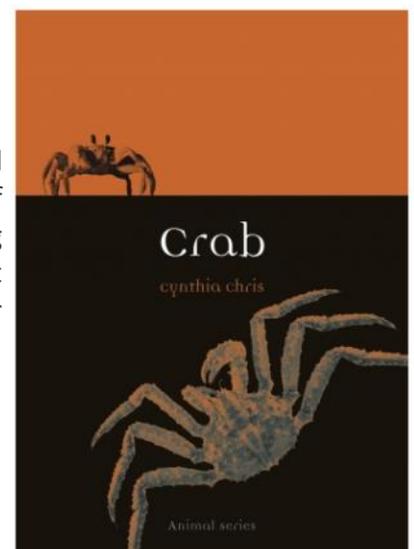
(<https://peerj.com/blog/post/115284883714/navigating-paths-ecr/>)

[Navigating Early Careers as Women in Marine Science: A WCMB panel discussion](https://peerj.com/blog/post/115284883754/navigating-ecr-as-women/)

(<https://peerj.com/blog/post/115284883754/navigating-ecr-as-women/>)

The 99th volume in the series *Animal*, published by the London-based press Reaktion, is "Crab." 'According to Patricia Backwell, Professor of biology, Australian National University, "This book explores everything that is interesting, weird, and wonderful about crabs. . . . Chris is part detective, part scientist, and always an exceptionally good writer. Her magnificent book will enthrall scientists and beginners alike."

More information can be found here: <http://www.reaktionbooks.co.uk/display.asp?ISBN=9781789143690> or contact the author at Cynthia.Chris@csi.cuny.edu





Research Papers

Let me introduce a new section as a trial. This will provide a space for you to share your recently published research papers (other than in JCB) that have relevance to crustacean research. If possible, include a link where the paper can be downloaded .
— Karen Schnabel (Editor *The Ecdysiast*)

- Baeza, J. A. (2020). Genome survey sequencing of the Caribbean spiny lobster *Panulirus argus*: Genome size, nuclear rRNA operon, repetitive elements, and microsatellite discovery. *PeerJ*, 8, e10554. doi:10.7717/peerj.10554 (download from: <https://peerj.com/articles/10554/>)
- Baeza, J. A. (2020). Yes, we can use it: a formal test on the accuracy of low-pass nanopore long-read sequencing for mitophylogenomics and barcoding research using the Caribbean spiny lobster *Panulirus argus*. *Bmc Genomics*, 21(1), 882. doi:10.1186/s12864-020-07292-5 (download from: <https://bmcgenomics.biomedcentral.com/articles/10.1186/s12864-020-07292-5>)
- Carpenter, J. H. (2021). Forty-year natural history study of *Bahalana geracei* Carpenter, 1981, an anchialine cave-dwelling isopod (Crustacea, Isopoda, Cirolanidae) from San Salvador Island, Bahamas: reproduction, growth, longevity, and population structure. *Subterranean Biology*, 37. <https://doi.org/10.3897/subtbiol.37.60653>

“Laboratory culturing of this isopod revealed surprisingly long durations for every stage of the life cycle, resulting in an estimated life span of >20 years. This appears to be longer than for any other isopod reported. Longevity is probably lengthened by starvation resistance, cannibalism, surviving multiple broods, and living in a relatively low-stress cave environment. Hopefully, this first rare glimpse into the life of a cave cirolanid will also provide useful insight into the lives of other cave crustaceans. I am grateful for the assistance of over 225 students and research assistants for their contributions to this project. ” (Jerry Carpenter)

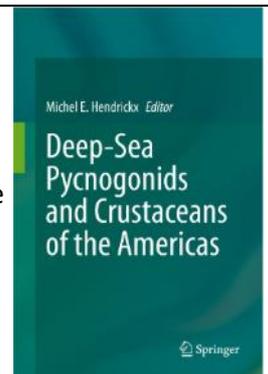
- Chan, B. K. K., Dreyer, N., Gale, A. S., Glenner, H., Ewers-Saucedo, C., Pérez-Losada, M., . . . Høeg, J. T. (2021). The evolutionary diversity of barnacles, with an updated classification of fossil and living forms. *Zoological Journal of the Linnean Society*. (download from: <https://doi.org/10.1093/zoolinnean/zlaa160>)

“I would also share that we are updating the WoRMS taxonomy accordingly and as people identify mistakes, updates, or are interested in sharing images, we’d be happy to include these on the WoRMS pages as well. As you can imagine, with an effort this large, there are bound to be some mistakes, so we are focused on the WoRMS system for our most up-to-date information.” (Keith Crandall)

- Cui, Z., Liu, Y., Yuan, J., Zhang, X., Ventura, T., Ma, K. Y., . . . Chu, K. H. (2021). The Chinese mitten crab genome provides insights into adaptive plasticity and developmental regulation. *Nature Communications*, 12(1), 2395. (download from: <https://doi.org/10.1038/s41467-021-22604-3>)
- de Grave, S., & Ng, P. K. L. (2021). The curious case of “innies”: Articles 50.1, 50.1.1 and the citation of authorities in Decapoda Crustacea—a way forward. *Zootaxa*, 4963(1), 10. doi:10.11646/zootaxa.4963.1.8
- Haubrock, P., Oficialdegui, F., Yiwen, Z., Patoka, J., Yeo, D., & Kouba, A. (2021). The redclaw crayfish: A prominent aquaculture species with invasive potential in tropical and subtropical biodiversity hotspots. *Reviews in Aquaculture*. doi:10.1111/raq.12531. (download from: <https://onlinelibrary.wiley.com/doi/full/10.1111/raq.12531>)
- Hendrickx, M.E. (2021) Deep-Sea Pycnogonids and Crustaceans of the Americas Cham, Switzerland. Springer. doi:doi.org/10.1007/978-3-030-58410-8



“ This book presents new and updated information on various groups of deep-sea pycnogonids and crustaceans occurring off the American continent. Offering a valuable reference resource for scientists interested in this fascinating fauna, it includes review papers and new data on the deep-sea communities occurring off the USA, Mexico, El Salvador, Costa Rica, Colombia, Chile, Peru, Brazil and Argentina, as well as in larger areas in both the East Pacific and the West Atlantic. As such it covers most of the current deep-water research in Latin America.”



- Horton, T., Marsh, L., Bett, B. J., Gates, A. R., Jones, D. O. B., Benoist, N. M. A., . . . Appeltans, W. (2021). Recommendations for the Standardisation of Open Taxonomic Nomenclature for Image-Based Identifications. *Frontiers in Marine Science*, 8(62). doi:10.3389/fmars.2021.620702. (download from: <https://www.frontiersin.org/articles/10.3389/fmars.2021.620702/full>)

“This paper by Horton *et al.* (2021) recommends best practice for the use of open nomenclature (ON) signs applicable to image-based faunal analyses. It is one of numerous initiatives to improve biodiversity data input to improve the reliability of biological datasets and their utility in informing policy and management.”

- Iwasa-Arai, T., Siqueira, S. G. L., Segadilha, J. L., & Leite, F. P. P. (2021). The Unique Amphipoda and Tanaidacea (Crustacea: Peracarida) Associated With the Brown Algae *Dictyota* sp. From the Oceanic Trindade Island, Southwestern Atlantic, With Biogeographic and Phylogenetic Insights. *Frontiers in Marine Science*, 8(307). doi:10.3389/fmars.2021.641236. (download from: <https://www.frontiersin.org/articles/10.3389/fmars.2021.641236/full>)
- Just, J. & Wilson, G.D.F. (2021). Redescriptions and new species in the ‘*Austrosignum–Munnogonium*’ complex sensu Just & Wilson (2007), mainly from the Southern Hemisphere (Crustacea: Isopoda: Paramunnidae). *Zootaxa*, 4952, 401-447. <https://doi.org/10.11646/zootaxa.4952.3.1>
- Mesaglio, T.P., Schilling, H.T., Adler, L. *et al.* (2021) The ecology of Lepas-based biofouling communities on moored and drifting objects, with applications for marine forensic science. *Marine Biology*, **168**, 21. <https://doi.org/10.1007/s00227-021-03822-1>
- Muller, E., de Gier, W., ten Hove, H. A., van Moorsel, G. W. N. M., & Hoeksema, B. W. (2020). Nocturnal Predation of Christmas Tree Worms by a Batwing Coral Crab at Bonaire (Southern Caribbean). *Diversity*, 12(12), 455. (download from: <https://www.mdpi.com/1424-2818/12/12/455>)
- Nishikawa, K. S., Negri, M., & Mantelatto, F. L. (2021). Unexpected Absence of Population Structure and High Genetic Diversity of the Western Atlantic Hermit Crab *Clibanarius antillensis* Stimpson, 1859 (Decapoda: Diogenidae) Based on Mitochondrial Markers and Morphological Data. *Diversity*, 13(2), 56. (download from: <https://www.mdpi.com/1424-2818/13/2/56>)
- Paulus, E., Brix, S., Siebert, A. *et al.* (Preprint). Recent speciation and hybridization in Icelandic deep-sea isopods: an integrative approach using genomics and proteomics. *Authorea*. April 06, 2021. doi:10.22541/au.161773761.10234925/v1. (download preprint from: <https://www.authorea.com/doi/full/10.22541/au.161773761.10234925>)
- Pérez-Schultheiss, J. & Wilson, G.D.F. (2021). A new genus and species of groundwater isopod of the family Protojaniridae (Isopoda: Asellota: Gnathostenetroidoidea) from southern Chile. *Zootaxa*, 4966, 550-562. <https://doi.org/10.11646/zootaxa.4966.5.4>

“This new genus from Chile extends our knowledge of the Protojaniridae so we produced a key to the genera of the family to help show its distinctiveness from the other species. We also provide detailed images of the species, including an annotated anatomy of the male pleopods.”



- Poore, G.C.B. (2021) Indo-West Pacific and Australian species of Eucalliidae with descriptions of four new species (Crustacea, Axiidea). *Memoirs of Museum Victoria* 80: 1-41. (download from: <https://museumsvictoria.com.au/collections-research/journals/memoirs-of-museum-victoria/volume-80-2021/>)
- Schwentner, M, Lörz, A-N. (2021). Population genetics of cold-water coral associated Pleustidae (Crustacea, Amphipoda) reveals cryptic diversity and recent expansion off Iceland. *Marine Ecology*; 42:e12625. (download from: <https://doi.org/10.1111/maec.12625>)
- Watanabe, H. K., Chen, C., & Chan, B. K. K. (2021). A new deep-sea hot vent stalked barnacle from the Mariana Trough with notes on the feeding ecology of *Vulcanolepas*. *Marine Biodiversity*, 51(1), 9. doi:10.1007/s12526-020-01144-x. (download from: <https://link.springer.com/article/10.1007/s12526-020-01144-x>)
- Wolfe, J.M., Luque, J., & Bracken-Grissom, H.D. (2021). How to become a crab: Phenotypic constraints on a recurring body plan. *BioEssays*, 43:e2100020. <https://doi.org/10.1002/bies.202100020>

Leaving on a lighter note...

Enjoy this beautifully illustrated Sea Change Project piece written by Jannes Landschoff that combines hermit crabs, tanaids, the Great African Seaforest and stunning photography:

<https://stories.seachangeproject.com/researching-the-hermit-tanaid>



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