



The Ecdysiast

Newsletter of The Crustacean Society

Message from the President...

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Message from the President...

Dear TCS Colleagues,

Happy New Year! I am very excited to report that the JCB switch to Oxford University Press (OUP). This move will mean a few editorial differences from our previous style. To smooth this process, the Editorial Board under the leadership of our Editor-in-Chief, Dr. Castro, are diligently working to make this transition as smooth as possible for our authors. In addition, to the journal will have a brand new look. The move to OUP will also bring a greater financial stability to our society. I want to thank the Editorial Board and the Treasurer for the hard work during the transition.

I wish to thank the outgoing TCS officers, in particular, Ole Møller for his four years of dedicated service to TCS as Secretary. Also, I wish to thank Kareen Schnabel for serving as the Indo-Pacific Governor. We look forward to their participation on future endeavors.

I was pleased to see all the participants at the Singapore meeting. I wish to thank Dr. Darren CJ Yeo and the wonderful Organizing Committee for creating a fantastic meeting, including a tour of the new Lee Kong Chian Natural History Museum. [Thank you Peter!]. The inclusion of Dr. Nipam Patel also increased our societal vision into Evo-Devo. Visiting with everyone, and meeting our members were among the highlights.

I hope to see you in New Orleans for our General Meeting associated with the Society for Integrative and Comparative Biology. TCS is sponsoring three symposia: 1) The Evolution of Arthropod Body Plans – Integrating Phylogeny, Fossils and Development; 2) Indirect Effects of Global Change: from Physiological and Behavioral Mechanisms to Ecological Consequences; 3) Low Spatial Resolution Vision - Function and Evolution [<http://www.sicb.org/meetings/2017/symposia/index.php>].

continued.....



I hope that the membership is also planning to participate in the TCS Summer Meeting in Barcelona, June 19-22, 2017. The early registration deadline is April 30, thus please put this date on your calendar. The meeting will be co-sponsored by 5th Crustacean Larval Conference and the 11th Colloquium Crustacea Decapoda Mediterranea. Please see their website: <http://www.tcs2017barcelona.com/index.html>.

I have been working with the Organizing Committee of ICC-IX, which will be in associated with the Smithsonian Institute in Washington, May 22-25, 2018. Please keep an eye on our website for updates.

If you are unable to attend these meetings, but have ideas on how we can improve and broaden TCS, please feel free to contact me. Also, please engage your regional governor on how TCS can make local improvements in your region as well as at our international levels.

With Aloha,
Brian Tsukimura



Crustacean Society Patron

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The Ecdysiast is published twice yearly in May and November and it is available in electronic form at http://www.crustaceansociety.org/Ecdysiast_Newsletter.html. 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 Board Members, 2016

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JCB language service

Before you submit a manuscript to JCB, and if you are not fully fluent or a native speaker of English, we recommend the following. American Journal Experts (AJE) provides professional language editing services to authors around the globe who wish to publish in scientific, technical, medical, and humanities journals. We urge authors who are not well versed in the English language to use this service to improve a paper's English and, therefore, its overall quality. Seeking this assistance is suggested before an article is submitted to JCB for peer review and certainly before it is finally accepted for publication.

AJE has over 500 editors from Harvard, Stanford, MIT, Berkeley, and Duke; these editors are native English speakers and subject matter experts in a wide variety of fields. They will check your manuscripts not only for terminology and language specific to your field but also for proper English usage, grammar, punctuation, spelling, verb tense, and phrasing. In addition, AJE's professional editors will make sure the text reads naturally and the sentences are well constructed. The cost for this service is very reasonable. Visit AJE's website for more information, or to submit a document for their scientific proof-reading service use this link: www.JournalExperts.com?rcode=JCB1.

When you are secure about your text, manuscripts then can be submitted on line through the new link: www.editorialmanager.com/jcb.



Treasurer's Report

Currently, TCS has nearly 400 members (282 online members and student members, 91 print and online members, and 25 patron members). As anticipated, although our membership numbers are strong we will have a shortfall at the end of 2016 that will be covered by earnings from TCS Schwab account investments. Based on our projected membership numbers and increased revenue as a result of the move to Oxford University Press by the Journal of Crustacean Biology, the Finance Committee projects that in 2017 the society will have a positive budget of ~US\$ 10K. Members of the Financial Committee (President Brian Tsukimura, Past-President Shane Ah Yong, Treasurer Jason Williams, and JCB Editor Peter Castro) met at the TCS summer meeting in Singapore and have been in conversation since then regarding the move to OUP and other financial items. In particular, the Financial Committee proposed that the compensation for the Executive Director be reduced to US\$ 1000/month effective January 2017 in response to the decreased administrative duties with the transition to OUP. This change was then approved by the the Board.

The meeting in Singapore was a great success and Dr. Darren Yeo (Chair of the Organizing Committee for the meeting) informed the society in July that the seed funding committed by TCS for the meeting was not needed. It should be noted that in addition to providing seed funding for mid-year meetings, TCS typically supports 1-3 symposia at the joint meeting with the Society of Integrative and Comparative Biology (SICB) in January; organizers are encouraged to contact our Program Officer (Dr. Joanne Taylor) and SICB Liaison Officer for TCS (Dr. John Zardus) to discuss proposed symposia. For SICB 2017, TCS is supporting three symposia: Indirect Effects of Global Change: from Physiological and Behavioral Mechanisms to Ecological Consequences (Organizers: Alex Gunderson, Jonathon Stillman & Brian Tsukimura); The Evolution of Arthropod Body Plans – Integrating Phylogeny, Fossils and Development (Organizers: Ariel Chipman & Doug Erwin); Low Spatial Resolution Vision - Function and Evolution (Organizer: Anders Garm).

Respectfully submitted,
Jason Williams





TCS Best Student Paper and Best Student Poster Awards Singapore, 2016

The Crustacean Society (TCS) is pleased to announce the winners of the Best Student Paper and Poster Competition held during the mid-year meeting of The Crustacean Society, July 11-13, 2016, in Singapore.

The best student Oral Presentation Award was presented to Claudia Tan (National University of Singapore) for her talk “Ecological and behavioural interactions between an alien and a native freshwater shrimp (Decapoda, Palaemonidae)”.

The best student Poster Award was presented to Shakir Khaizar (National University of Singapore) for the presentation entitled “Potential effects of non-native crayfish on a native freshwater crab in Singapore”.

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. Additionally, a prize pack of books was generously donated by the conference organizing committee. TCS thanks those members who served as judges and all student participants.

The following students were also presented with a prize pack of books as Merit Awards.

Jonas C. Geburzi (Alfred-Wegener-Institute, Helmholtz-Centre for Polar and Marine Research, Germany) for his talk entitled “Timing matters for successful invader establishment: shifted recruitment cycles between native and alien crabs”.

Sarah Hayer (Zoological Museum Kiel, Germany) for her talk entitled “New insights into the evolution of Brachyura: the female reproductive systems of two dorippoid crabs”.

Stephanie Köhnik (Zoological Museum Kiel, Germany) for her poster entitled “When the button’s gone: pleon attachment in male and female *Carinus maenus* (Decapoda: Portunidae)”.

Adeline Yong (Nanyang Technological University, Singapore) for her talk entitled “Saving for a rainy day: caching excess food in *Ocypode gaudichaudii*”.

Abstracts of the major prize winning presentations:

Ecological and behavioural interactions between an alien and a native freshwater shrimp (Decapoda: Palaemonidae)

Tan, Claudia L. Y., Zeng, Yiwen, Yeo, and Darren C. J. a0099687@u.nus.edu

Understanding both abiotic and biotic mechanisms of alien decapod spread is vital to managing invasive alien crustaceans (IACs). To this end, this study investigated the combined effects of environmental factors and agonistic interactions between two freshwater shrimp species in Singapore: *Macrobrachium malayanum*, a native shrimp that is predominant in shaded forest streams, and *Macrobrachium nipponense*, an alien shrimp that inhabits more open, rural streams (as well as reservoirs). The effects of both these abiotic and biotic factors on species survivorship were studied in-situ in a 14-day species interaction experiment in the two different stream habitats. While the survivorship of *M. malayanum* decreased significantly under rural stream conditions, *M. nipponense* could tolerate mild forest stream conditions, suggesting that the alien species’ wider physiological tolerance could allow it to spread into native shrimp strongholds in forest streams. Under rural stream conditions, *M. malayanum* was found to be equally competitive with *M. nipponense*, although agonistic behaviour differences could reduce fighting costs in the alien species. However, the native shrimp significantly decreased the alien shrimp’s survivorship in forest stream conditions, indicating its competitive superiority over *M. nipponense* within its forest stream strongholds. In hindering the spread of *M. nipponense*, this combination of abiotic and biotic variables reinforces the importance of simultaneously studying various factors that could influence a potential IAC’s ability to spread, and highlights the need to preserve the ecosystem integrity of native species strongholds.



TCS Best Student Paper and Best Student Poster Awards Singapore, 2016

Potential effects of non-native crayfish on a native freshwater crab in Singapore.

Shakir, Khaizar K., Zeng, Yiwen, and Yeo, Darren C.
J. khaizar_shakir@u.nus.edu

Human-mediated introductions of crayfish beyond their native distribution have resulted in numerous ecological impacts, particularly on native taxa occupying similar ecological niches (e.g. freshwater crabs) in the recipient ecosystems. Currently, two non-native crayfish species, *Cherax quadricarinatus* and *Procambarus clarkii*, have been recorded from artificial lentic habitats (reservoirs) in Singapore, with the former observed to have spread into several freshwater forest streams. Considering the habitat overlap and potential negative effects these crayfish might have on native freshwater crabs, this study investigated: i) the effects of pH (which shows characteristic differences between forest stream and reservoir conditions) on the survivorship and growth of *C. quadricarinatus*, *Pr. clarkii*, and a native freshwater crab (*Parathelphusa maculata*), in a laboratory experiment; and ii) local distribution and habitat characteristics in a forest stream in Singapore where *C. quadricarinatus* and *P. maculata* occur syntopically, in a field survey. Experimental results indicated that while both *C. quadricarinatus* and *Pr. clarkii* can persist in reservoirs, only *C. quadricarinatus* is able to tolerate freshwater forest streams conditions. Field survey results suggested that *C. quadricarinatus* distribution was also associated with other stream conditions such as presence of hard substrate. This study reveals that environmental filtering by stream acidity alone is unlikely to be an effective barrier against the spread of *C. quadricarinatus* in tropical forest streams. Findings of this study have implications not only for our understanding of physiological range and tolerance of two well-known alien crayfish species, but also for informing management and conservation of native freshwater crab species.

TCS Graduate Scholarship Awards 2016

The Crustacean Society (TCS) annually awards up to six US\$1000 scholarships in graduate studies on crustaceans. We are very pleased to announce the following successful recipients for 2016:

Biology of Large Branchiopods (Denton Belk Memorial Scholarship). **Zandra Maria Skandrup Sigvardt**: Phylogeny of the Laevicaudata. Zandra is a PhD Student at the University of Copenhagen, Denmark, supervised by Dr. Jørgen Olesen.

Ecology and Behavior: Ecology, Population Genetics **Ana Jurcak**: Predator-prey dynamics: the role that non-consumptive effects (NCE) play in ecosystem functioning. Ana is a PhD Student at Bowling Green State University, OH, USA, supervised by Dr. Paul Moore.

Ecology and Behavior: Ecology, Population Genetics **Alexandre Varaschin Palaoro**: How weapons are forged – assessing how claw shape and morphology interact to increase claw performance. Alexandre is a PhD Student at the Universidade Federal de Santa Maria, Brazil, supervised by Dr. Sandro Santos.

Physiology and Reproductive Biology **Alyssa Liguori**: Multigenerational responses to ocean acidification in the copepod, *Tigriopus californicus*. Alyssa is a PhD Student at Stony Brook University, NY, USA, supervised by Dr Dianna Padilla.

Systematics, Biogeography, and Evolution **Jorge Perez Moreno**: Adapting to Life in the Extreme: Molecular Insights from Subterranean Waters. Jorge is a PhD Student at Florida International University, USA, supervised by Dr Heather Bracken-Grissom.

Systematics, Biogeography, and Evolution **Mathis Messenger**: Modeling the rapid spread of rusty crayfish, *Orconectes rusticus*, in the Columbia River. Mathis is a Master's Student at the University of Washington, USA, supervised by Dr Julian Olden.



TCS Travel Awards for Early Career Researchers 2016

The Crustacean Society (TCS) awards up to three \$1500 travel grants for early career researchers (awarded Ph.D. within 5 years of the application deadline). The grants are for researchers to present results of their work on any field of study involving crustaceans at a TCS meeting (SICB, Mid-Year, or ICC). We are very pleased to announce the following successful recipients for 2016.

Dr Jason Goldstein

University of New Hampshire

A presentation titled: A fishery in flux: Claw removal and its impacts on survivorship and physiological stress in the Jonah crab (*Cancer borealis*), will be given at the 2017 SICB meeting in New Orleans.

Dr Emma Palacios Theil

University of Louisiana

A presentation titled: Molecular analyses for the study of the relationships of the pinnotheroid genera Parapinnixa, Sakaina, and Tetrias (Decapoda: Brachyura) to other brachyuran families, was given at the 2016 TCS meeting in Singapore.

Dr Amr Farag Zeina

Al-Azhar University, Egypt

A presentation titled: A new species of the genus *Cerapus* Say, 1817 (Crustacea: Amphipoda: Ischyroceridea) from Egyptian Red Sea waters, was given at the 2016 TCS meeting in Singapore.



TCS Student Travel Awards 2016

The Crustacean Society annually awards up to ten \$450 awards to support student attendance at TCS meetings (SICB, Mid-Year, or ICC). The TCS Board congratulates all recipients of the 2016 awards, and we are very pleased to announce the following successful recipients for 2016.

Presented at the 2016 TCS meeting in Singapore

Ya'arit Levitt Barmats: Investigating the symbiotic relationship between the caridean shrimp *Odontonia sibogae* and its ascidian host.

Chu Kelin: Threats, status, and conservation challenges of the potamid freshwater crabs of China.

Sarah Hayer: New insights into the evolution of Brachyura: the female reproductive systems of two dorippoid crabs.

Yongkun Ji: Molecular Phylogeny, morphological and habitat differentiation among potamid freshwater crabs in Hainan Island, China.

Conni Sidabalok: Review of the *Cirolana* "parva-group" of scavenging isopod crustaceans (Cirolanidae) in the Indo-Pacific..

Louisa Wood: Phylogeographic patterning within two caridean shrimp species reveals high levels of connectivity across marine biogeographic regions in South Africa.

Yu Meng-Chen: First report on the cypris morphology of sponge-inhabiting barnacles (Archaeobalanidae: Acastinae): comparisons of the antennular morphology across wide varieties of settling substratum.

Presenting at the 2017 SICB meeting in New Orleans

Alejandro Lopez-Ceron: Characterization of stress response genes in the molting gland of decapods.

Matthew Merritt: DNA Sequencing of Farnesoic Acid O-methyltransferase in *Trips longicaudatus*.

Hailey Salas: Effects of thermal stress on reproductive potential of *Petrolothes conctipes* through Vg quantification using an ELISA.

The deadline for the next round of scholarship applications will be 31 March 2017.



TCS Mid- Year Meeting, Singapore 2016 Conference Photo





**Book Review: Emmerson, W.D. 2016. A Guide to, and Checklist
for, the Decapoda of Namibia, South Africa and Mozambique.
Volumes 1–3
Reviewed by G.C.B. Poore**

Emmerson, W.D. 2016. A Guide to, and Checklist for, the Decapoda of Namibia, South Africa and Mozambique. Volumes 1–3. Cambridge Scholars Publishing. Hardback, A5. (Vol. 1) lxii+526 pp. ISBN-13:978-1-4438-9090-8, ISBN-10:1-4438-9090-1, £72.99. (Vol. 2) 645 pp. ISBN-13:978-1-4438-9097-7, ISBN-10:1-4438-9097-9, £83.99. (Vol. 3) 711 pp. ISBN-13:978-1-4438-9306-0, ISBN-10:1-4438-9306-4, £73.99.

Gary C. B. Poore, Museum Victoria, GPO Box 666, Melbourne, Victoria 3001, Australia

My first job after graduating was to assess crustacean diversity as part of an environmental assessment of a large bay near Melbourne. I did not know the Australian fauna but was set on my way with two volumes by my side. One was 40 years old, *Crustaceans of South Australia* (Hale, 1927, 1929) which got me started on identifying decapods and isopods to species. The other was *The families and genera of marine gammaridean Amphipoda* (Barnard, 1969) which enabled me to learn to recognise amphipod taxa, even though most of the species I was discovering were then undescribed. Later, my surveys took me further afield within Australia so I came to rely on guidebooks from other countries, notably the *Descriptive catalogue of South African decapod Crustacea* (Barnard, 1950) and *Crabs of Japan* (Sakai, 1976). More recently I have referred to the series, *Crustacean fauna of Taiwan* (Chan et al., 2009; Chan, 2010). While few of their species were to be found in Australia these two works had keys and pictures that helped me get into the specialist primary literature. Ever since, I have been a fan of synthetic works such as these, publications that bring together for the non-taxonomist what is known. I have even tried it myself (Poore, 2004) in the belief that regional guides can have global usefulness.

When I saw Winks Emmerson's '*Guide to ...*' a guide is what I expected. I was hoping for lots of keys to identification but there are none. Nor are there figures that would help anyone identify reliably a species of decapod in the lab or field. This 3-volume set is a different thing. The volumes contain an enormous amount of information, not just on decapods in southern Africa but much that is relevant to decapods globally. To quote from the introduction 'The purpose ... is to provide an updated guide to the decapods that live around Namibia, southern Africa and Mozambique, to bridge the gaps between taxonomy, ecology and the fossil record, and hopefully stimulate interest ...' Of over 1000 species which are catalogued in volume 3, 262 species are featured in detail. For each of these species there is a photograph and detailed information. All decapod families found in southern Africa are covered in one way or another.

Volume 1 starts with a 92 pages of introduction, research history, biodiversity and future research, a section on commercial and artisanal food value plus an overview of classification. A few subheadings would have been helpful as much is covered. These chapters are richly laced with citations as are all volumes. In fact, the references at the end of volume 3 total 229 pages and include around three and a half thousand titles (at my estimate). The literature covered is right up to date. I didn't check to be sure all were cross-referenced but was surprised that while 'WoRMS' was cited as a source for taxonomy or species numbers more than once it did not appear in the references (WoRMS Editorial Board, 2016).

The bulk of the volumes, 1882 pages in all, treats the Decapoda in a standard taxonomic order. The text under each higher taxon varies in content but that for species is organised under most or all of nine headings: *Synonymy, Common Name, Description, Distribution, Zonation and Habitat, Phylogeny, Commercial Importance, Aquaculture, Etymology*.

.....cont.



Some higher taxa are diagnosed and competing classifications are discussed at length. However, some taxa, Caridea for example, are not diagnosed at all but their higher and lower classifications are reviewed. Most families are diagnosed, this text often merging into a taxonomic or phylogenetic review and ecological generalities – all supported by numerous citations. Surprisingly, genera as such are not covered at all. They may be listed and the numbers of included species given under family headings but they are never diagnosed. Because only a quarter of the known species are discussed in detail, the remaining three-quarters are listed under a family heading and in the appended 64-page checklist in volume 3 where each name is accompanied by a coded distribution and references. Only the families and species treated in detail, listed by genus name, appear in the index of each volume separately.

Most species are accompanied by a colour photo but in many cases these would not be useful for identification – many prawns look superficially alike and can be distinguished only by counting spines or grooves. Line drawings are provided for many species but these too do not highlight diagnostic features and even if they do are reproduced too small to be truly useful. The descriptions are extremely detailed but critical diagnostic features that would help in telling one species from another are not highlighted. The amount of ecological data accompanying each species is impressive – so much so that the reader has little need to refer to the cited sources. Placing the section *Phylogeny* with individual species puzzles me. The numerous phylogenetic studies referred to – they are numerous and well summarised – deal primarily with higher taxa, species or generic relationships based in many cases on molecular data. To my mind, some of these sections are repetitive which would have been avoided if phylogenies had been dealt with under a relevant higher taxon. Taking a group that I know well, I find reviews of ‘thalassinidean’ phylogeny at infraorder, family and generic levels, citing the same papers, on page lix under Classification, pages 367–369 under Axiidea, page 373 under Callianassidae, and pages 380–381 under *Callichirus kraussi*. The unresolved discussion of the phylogeny of Penaeidae and its impact on generic classification reappears throughout the section on this family, as does commentary on relationships within Palinuridae, when these could have been brought together as one under relevant family headings.

As in any work of this size, and taking as long to compile as this one surely did, errors creep in. I can comment only on those in groups I know. The axiidean family Calocarididae (vol. 1, p. 382) is accepted by some authors but not by others (De Grave et al., 2009) and I sympathise with anyone trying to understand the systematics of this group. *Calocaris barnardi* Stebbing, 1914 belongs in this ‘family’ as does *C. macandreae* Bell, 1846 from the Mediterranean and North Atlantic. Records of the two species in southern Africa are certainly synonymous and the two species were said to be synonymous over their entire range (Sakai, 2011). *Calocarides capensis* Kensley, 1996 and *C. macphersoni* Kensley, 1996 have never been members of ‘Calocarididae’ – the genus belongs in Axiidae. However, *Ambiaxius alcocki* (McArdle, 1900), listed as an axiid would be a calocaridid under this arrangement. The munidid species *Agononida incerta* Henderson, 1888 (vol. 2, p. 31) has been found to be ten species, those from southern Africa being *A. africerta* Poore & Andreakis, 2012 and *A. madagacerta* Poore & Andreakis, 2014 (Poore and Andreakis, 2012, 2014).

The literature coverage is truly impressive. Even without a special interest in the southern African fauna, any decapod researcher, ecologist, palaeontologist or taxonomist, will find this a valuable resource for even the most recent papers. Emmerson might have cited Dworschak et al. (2012) as a recent thorough review of ‘thalassinidean’ systematics and biology and Poore et al. (2011) for the biology of squat lobsters but I noticed few such oversights.

I found the B5 format of these volumes too small for such a large work. The three volumes fill 130 linear mm of shelf space. Perhaps the author too was anticipating a larger page size. Colour figures accompanying the introduction are labelled in sets of a to h, eight per page, but appear as two or three per page with a somewhat disconnected legend following. Figures of each species appear before rather than after their headings without a legend, and the legend for the figure accompanying each family treatment appears at first glance to be a heading for the following text. All a bit disconcerting until it is figured out.

.....cont.



The blurb states that the volumes ‘... will serve to stimulate interest and future research into southern Africa’s rich decapod biodiversity, especially at a time when biodiversity itself is threatened by global warming, coral bleaching and habitat loss. It will appeal to people interested in Decapoda, including academics, scholars, students, fishermen, aquarists, aquaculturists, recreational snorkel and SCUBA divers, as well as those interested in conservation, biodiversity, management and governance.’ All this is true. It will be too detailed for some, or too expensive, but I am confident that it will be referred to for a while yet.

- Barnard, J. L. 1969. The families and genera of marine gammaridean Amphipoda. United States National Museum Bulletin 271: 1–535, 173 figs.
- Barnard, K. H. 1950. Descriptive catalogue of South African decapod Crustacea (crabs and shrimps). *Annals of the South African Museum* 38: 1–837.
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