



CRAYFISH NEWS

THE OFFICIAL NEWSLETTER OF THE INTERNATIONAL ASSOCIATION OF ASTACOLOGY

Winter Issue
December 2018
Volume 40, Issue 4
p-ISSN: 1023-8174 (print)
e-ISSN: 2150-9239 (online)

CONSERVATION STATUS OF ECTOSYMBIONT BRANCHIOBDELLID CRAYFISH WORMS IN JAPAN

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Figure 1. Conservation measures to assist endangered freshwater crayfish, *Cambaroides japonicus* and their endemic branchiobdellidans in Hokkaido, Japan: translocating *C. japonicus* with worms by children.

IAA online



Freshwater crayfishes have various kinds of symbionts. The family Branchiobdellidae is a group of oligochaete worms that live as ectosymbionts on the surface of the exoskeleton or in the gill chamber of Holarctic freshwater crayfishes of the families Astacidae and Cambaridae. The endemic freshwater crayfish genus *Cambaroides* is distributed in Far East Asia, including Japan. Ectosymbiont crayfish worms of the genus *Cirrodrilus* (Clitellata: Branchiobdellidae) were observed in *Cambaroides* species. The Fisheries Agency and

Ministry of the Environment of Japan have designated *C. japonicus* as an endangered species, along with 11 species of native branchiobdellidans in 2007.

Documents from the Japanese Minister of Land, Infrastructure and Transport state that public construction works must provide environmentally responsible measures for the conservation of endangered organisms. This involves several kinds of public construction

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PRESIDENT'S CORNER



Tadashi Kawai, Ph.D.
IAA President (Japan)

Dear IAA members

Can you believe the incredibly huge amount of 850,000 tons of harvested crop of the red swamp crayfish *Procambarus clarkii*? It was officially reported by the Ministry of Agriculture and Rural Affairs of the People's Republic of China in 2016. Plus, according to www.moa.gov.cn (December 18th, 2018), China produced 1,120,000 tons of *P. clarkii* in 2017!

Cambaroides dauricus and *C. schrenckii* are native to China and were eaten as local foods in the northern area of the country. Nowadays, alien *P. clarkii* dominate the Chinese food market. Japanese regional literature reports that a Japanese owner of a bullfrog aquaculture pond imported *P. clarkii* from New Orleans, Louisiana (USA) in 1927. Later, alien *P. clarkii* were imported to China from Japan around 1930.

China has a huge number of large aquaculture ponds for farming crayfish (Fig. 1 and 2). Most of the farmed *P. clarkii* are cooked using much cayenne pepper powder and consumed as such by the Chinese people (Fig. 3 and 4). China is a new "Hot Spot" of freshwater crayfish. However, the scientific study of crayfish has yet to be developed in this country. I think that the IAA should encourage the interest for astacology among the Chinese people.

An international scientific meeting on crustacean biology, organized by The Crustacean Society, will be held in Hong Kong in May 2019. I will organize a [symposium](#) on "Biology of



Figure 1. Pond for the red swamp crayfish *Procambarus clarkii* in Shanghai, China (Kawai & Takahata, 2010).



Figure 2. Collected alien red swamp crayfish for Chinese foods (Kawai & Takahata, 2010).

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The International Association of Astacology (IAA), founded in Hintertal, Austria in 1972, is dedicated to the study, conservation, and wise utilization of freshwater crayfish. Any individual or institution interested in furthering the study of astacology is eligible for membership. Service to members includes a quarterly newsletter (*Crayfish News*), a membership directory, biennial international symposia and publication of the journal *Freshwater Crayfish*.

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Header photograph: Noble crayfish (*Astacus astacus*) © 2018 Karolina Śliwińska

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Figure 3. Cooked *Procamburus clarkii* (Kawai & Takahata, 2010).

Freshwater Crayfish” at this meeting in Hong Kong. The symposium will be organized as an IAA regional meeting in Asia and Oceania. European IAA member Antonín Kouba (University of South Bohemia, Czech Republic) will attend the meeting as an invited speaker. Being a member of the organizing committee for the next biannual IAA meeting in 2020, Antonín will also attempt to raise interest for attending the IAA23 symposium in the Czech Republic and hopes to attract a high number of participants.

European member Jiří Patoka of the Czech University of Life Sciences Prague will attend as an invited speaker and talk about conservation of New Guinean *Cherax*. Also, executive board members James Furse (Griffith University, Australia), Quinton Burnham (Edith Cowan University, Australia), Juan Carlos (San Jose University, Costa Rica) and Jason Coughran (Sheridan College, Australia) are planning to attend the symposium. By gathering interesting talks, we hope to develop an interest for astacology in China. I encourage all speakers to submit their fascinating talks to our journal “Freshwater Crayfish” and I hope many IAA members will attend the regional meeting in Hong Kong. If you are interested in attending the symposium, feel free to e-mail me: tadashikawai8@gmail.com.

Finally, I am very glad to bring you the news that executive board member Quinton Burnham and longtime IAA member Kathryn have just married! To my knowledge, this is the first IAA couple. I would like to give them a special word of congratulations and I wish that the newlyweds continue their astacological endeavors for many years to come. 🙌

Tadashi Kawai

IAA President

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Kawai T & M. Takahata, 2010. *Biology of crayfish*, Hokkaido University Press, Sapporo, 556pp.



Figure 4. Chinese people eat 850,000 tons of crayfish per year! (Kawai & Takahata, 2010).



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Figure 2. An arch type culvert over the natural habitat of *Cambaroides japonicus* and their endemic branchiobdellids in Hokkaido, Japan.

projects, for example river, dam, road and railway constructions, and these have a negative impact on the natural habitat of *C. japonicus* hosting branchiobdellidans. Based on this background, numerous efforts were undertaken in the field, trying to prevent negative impacts of developmental constructions on endangered host crayfish with symbiont branchiobdellidan species.

One of the techniques developed for conservation uses an arch type culvert over a natural habitat (Fig. 2), but this increases the costs of road construction. Another solution is providing mitigation ponds to compensate for loss of a natural habitat (Fig. 3). Although these artificial ponds create new natural habitats for endangered freshwater crayfish, the available space next to the roads is very limited in Japan. Recently, translocating crayfish from their natural habitat to another natural habitat nearby, is arranged in many places to avoid negative impact due to road construction works. The translocation is inexpensive and easy. Even children can assist in the translocation of the



Figure 3. Artificially created pond along the natural habitat of *C. japonicus*.



Figure 4. Children translocating *C. japonicus* with worms.

endangered crayfish and their worms. This is an effective educational experience for teaching the younger generation about the importance of conserving endangered species (Fig. 4). Translocation of native *C. japonicus* with branchiobdellidans is a major conservation procedure in Japan. Branchiobdellidans are even more sensitive organisms than their host crayfish, because they are small and have a soft body structure. There's a concern that loss of branchiobdellidans may occur during translocations for the conservation of native crayfish in Japan. Therefore, the Japanese conservationists should focus on the potential negative impact of crayfish translocations on their ectosymbiont branchiobdellid worms.

Two alien freshwater crayfish, *Procambarus clarkii* and *Pacifastacus leniusculus* have been introduced into Japan and are now found in Hokkaido and the northern part of Japan where endangered native *C. japonicus* live. *P. leniusculus* also carry alien branchiobdellidans on their bodies. There are only a

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few records of their endemic ectosymbionts occurring in the alien locations. Concerning branchiobdellidans, *Cambarincola mesochoreus* - a species native to North America - was found in northern Italy (Gelder et al. 1994, 1999). Since two alien species - *Sathodrilus attenuatus* and *Xironogiton victoriensis* - naturally occur on *P. leniusculus*, there is concern that these alien crayfish worms will transfer to native crayfish in Japan and have an effect on native species diversity. No crayfish worms had been reported on alien *P. clarkii* in Japan, until a recent discovery recorded alien branchiobdellidans on *P. clarkii* in downtown Tokyo. Although there have been no scientific reports on the transfer of alien branchiobdellidans in Japan, we should watch carefully for this potential threat. ♣

Tadashi Kawai
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We thank Professor S.R. Gelder for making suggestions for this article.

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SHORT ARTICLE

Call for Increased Accuracy in Crayfish Nomenclature

There have been numerous changes to crayfish nomenclature over the last year and a half. Amongst these are the resurrection of the genus *Faxonius* to encompass all surface-dwelling crayfishes previously in *Orconectes*, the splitting of *Fallicambarus* into two genera (*Fallicambarus* and *Creaserinus*), and the elevation of the subgenus *Lacunicambarus* to generic rank. These changes reflect advances in our understanding of the evolutionary relationships between our favorite crustaceans, and have largely been driven by genetic analyses which are becoming increasingly important in taxonomy.

Unfortunately, while many researchers are adopting these taxonomic changes, outdated names are still being used frequently. For instance, I recently looked through the program of the 2019 Society for Integrative and Comparative Biology (SICB) Annual Meeting in Tampa, Florida, which was held in conjunction with The Crustacean Society's annual meeting. In the program, I found 17 crayfish scientific names. Of these, 11 (65%) were correct, while 6 (35%) were out of date. I have also caught similar mistakes in a surprising number of recently published papers.

These mistakes are no grave crimes, but it's important that we

strive for nomenclatural accuracy in our field. Scientific names exist to promote stability in a world with millions of species of plants and animals. They enable researchers from all different nationalities to refer to their focal organisms by a single name that will be widely understood. These names are subject to changes (as mentioned above), but they only change under the guidelines of the International Code of Zoological Nomenclature (ICZN), which addresses nearly all conceivable situations that could arise throughout the process. Although these mistakes may seem trivial to us, it's important to think of this from the perspective of people outside of our field who may not realize that names like *Faxonius rusticus* and *Orconectes rusticus* refer to the same organism.

I propose the following solution to this problem: the World Register of Marine Species (WoRMS) includes an updated catalogue of all crayfish species that includes the current and all previous names for each taxon, as well as links to papers in which any nomenclatural changes have been made. Here is the link for the infraorder Astacidea, which includes both crayfish superfamilies: [WoRMS taxon details - Astacidea](#). Please note that you should uncheck "marine taxa" from your searches on this site or you will not get any crayfish results. Whenever you write a paper, if you are uncertain about a name, I suggest searching for it on this database. If you review a paper and you

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find an outdated name, please ask the authors to update it and provide a link to the WoRMS page for that taxon in case the authors or editors want further justification. Lastly, I suggest that all taxonomists contact Dr. Keith Crandall (kcrandall@gwu.edu) whenever they describe new species or make taxonomic changes so that he can promptly update the database accordingly.

These simple steps should be sufficient to stabilize and help resolve any confusion about crayfish taxonomy.

Mael Glon

SOCIAL MEDIA

Twitter has been our most active social media platform in the last few months. Here are some remarkable crayfish related Tweets that have come across our screen!

Mael Glon



PBA Paul Bradley
@PBA_Ecology

Delighted to report @PBA_Ecology just achieved best ever white-clawed #crayfish captive breeding success. Hundreds of juvs going to specially designed soft release setup this week.

PBA delivering a 3-year prog of carefully monitored #reintroduction in Upper #Ribblesdale. #Ribble

♡ 87 4:43 PM - Oct 14, 2018



Ontario Parks
@OntarioParks

One biologist used @iNaturalist to report a crayfish he found. However, it wasn't an ordinary crayfish – it turns out it was a Painted Mudpug, a species of crayfish never before reported in Canada! bit.ly/2vIQXds

♡ 302 5:15 PM - Oct 29, 2018



Alexa
@Alexa_Ballinger

Happy Halloween! #ChelaeUp

♡ 64 3:54 PM - Oct 31, 2018





Ian Kusabs
@DrRotokakahi

Wow what a day on Lake Rotorua on Monday. CPUE of approx. 50 kōura per whakaweku ranging in size from 15 to 52mm OCL. Here's a short underwater (GoPro) video when they were released back into the lake. #mātauranga #crayfish #kōura #Rotorua #Fieldwork @jfb_enviro

67 8:50 PM - Nov 27, 2018

Zen Faulkes
@DoctorZen

#Crayfish #AdventCalendar, Day 7: *Procambarus acutus*, a.k.a. pinchi boi

24 7:32 AM - Dec 7, 2018

MEETING ANNOUNCEMENTS

Crayfish meeting Gotland 2019 – save the date

A European crayfish conference is planned for **August 27-29, 2019**, followed by an **excursion and a traditional crayfish party on the 30th**. The event will take place in the town Visby on Gotland, the largest island in the Baltic Sea. Apart from usual crayfish topics like crayfish plague, conservation, genetics, physiology, management and invasives there will also be a special theme with aquaculture in general and crayfish culture in particular. The meeting is organised by Swedish University of Agricultural Sciences, Blue Centre Gotland, Eastern Finland University, and Gotland County Administrative Board. More information will follow.

Lennart Edsman
Sweden



The Crustacean Society Mid-Year Meeting

Hong Kong
26-30 May 2019



LITERATURE OF INTEREST TO ASTACOLOGISTS

To view abstracts, etc., click on a reference to be taken to the journal website (some references may not contain links).

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