

ASCIDIAN NEWS*

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For the last issue of AN, coming out at a very challenging time for everyone, I asked how and what you are doing, how you are coping, are you able to continue your research and teaching, has this been a good time to write up earlier work; what would you like to share with other readers of AN. Well, here we are still in this pandemic, so I asked the same questions and again I received an incredible response! A number of correspondences are included in the next two sections. Nearly everyone still expresses confidence at having met the challenges and a great feeling of accomplishment ; congratulations to you all! There are **100** new publications since June. Thank you for letting me know how important AN continues to be. Please keep in touch and continue to send me contributions for the next issue. Keep safe, keep working, and good luck to everyone.

***Ascidian News is not part of the scientific literature and should not be cited as such.**

NEWS AND VIEWS

1. From Hiroki Nishida: The **11th ITM (Intl. Tunicata Meeting)** is scheduled to be held in Kobe, Japan on July 11th (Sunday) to the 16th (Friday), 2021. However, the organizing committee has not yet decided how or if to do it because of Covid-19 . We guess everyone is having a difficult time, and visiting Japan from other countries is still restricted. We have also the next summer Olympics scheduled in Japan in July, but it is not decided yet as well. We think that we have to decide in Jan. or Feb. next year about the ITM. If we cannot host an ordinary meeting, there are two ways, online meeting or to postpone the meeting for a year. We have attended Zoom (for talks) and Remo (for posters) meetings several times. It works well but we need persons skillful for an online meeting. We also know that some researchers would like face-to-face exchanges because the ITM is a nice size to do that. And some would like to visit Japan (again). So it is really a hard decision. More information will be sent via the Tunicata listserv next year. –the organizing committee of the 11th ITM at Kobe.

2. From Greg Ruiz (ruizg@si.edu), Chela Zabin, and Jeff Crooks:

After much deliberation, the ICMB (Intl. Conference on Marine Bioinvasions) Local Organizing Committee (LOC) and Scientific Steering Committee (SSC) have decided to postpone **ICMB XI until 15-19 May 2022** at the same venue in Annapolis, Maryland. We decided to postpone the meeting first and foremost to ensure the safety and health of participants and our community. We simply do not know whether large gatherings or international travel will be safe and feasible in May 2021. While we considered transforming ICMB XI into a virtual conference, we feel strongly that the interpersonal connections and development of the marine invasions community are a fundamental aspect of ICMB meetings and that this is difficult to recreate online. Moreover, there would be significant logistical challenges associated with a full, multi-day virtual meeting attended by people from all over the world in different time zones. We recognize that the postponement of the conference means that some

students won't be able to present or participate in a meeting of our community, since the last conference was in 2018. We are now considering additional ways to engage these students and highlight their work, including smaller focused virtual talks, workshops, publications, or seminars. We are hopeful that this delay will allow us to hold the in-person conference and provide opportunity for our entire community to participate. We urge you to stay up to date with ICMB XI by [subscribing](#) to the email listserv or following us on [Twitter](#), [Facebook](#), or [Instagram](#).

3. From Lionel Christiaen (lc121@nyu.edu): I will be the next director of the Sars Center for Marine Molecular Biology in Bergen, Norway, starting in January 2021, and following Daniel Chourrout, who established the Centre. There is a strong focus on marine animals at the Centre, including tunicates. As I will start a research lab at the Centre I will soon be looking to hire personnel.

Here is a press release on the Centre's website:

<https://www.uib.no/en/sarscenteret/139577/warm-welcome-our-new-director>

A notable piece of news is that we have an open search for junior group leaders, with a deadline for applications on November 30th, 2020. [From your editor: This is after the deadline for this issue of *Ascidian News* but if you write directly to Lionel he might allow a late submission.] The link to the ad is here: <https://www.jobbnorge.no/en/available-jobs/job/188815/group-leader-positions-sars-centre-6-year-contracts>

Thank you for your continuous effort bringing the community together.

4. From Gretchen Lambert: In AN85 I announced the publication of an important new book on ascidians by Anne Bay-Nouailhat and Wilfried Bay-Nouailhat (2020), *Guide des Tuniciers de l'Europe de l'Ouest*. M&L editions. 240 pages. ISBN: 978-2-9571115-0-3. <https://www.mer-littoral.org/guide-tuniciers.php> or livre.tuniciers@gmail.com. (mer.littoral@gmail.com) Now that I have had a chance to spend more time with it, I want to add some additional comments. It is truly a beautiful book but also so very carefully and thoughtfully organized for ease and quickness to use. It includes a useful fold-out inside front cover for a quick review of body parts for the amateur, the introductory sections are excellently done while not being too long, and are accompanied by very good photos and diagrams. Throughout the book the underwater color photos are excellent, even for *Diplosoma listerianum* which I know from experience is extremely difficult to photograph well. While I usually do not use common names, they are important in a book such as this, and I was charmed by the appropriateness of the "fraise de mer" for an *Aplidium* sp. I also like the tables for individual genera or families giving special characters for distinguishing them, along with the superb photos. I appreciate the inclusion of the planktonic Tunicata, with fabulous photos; amateurs see them and have no idea what they are looking at. It is clear to me that everyone working on or interested in ascidians, especially European species, should have a copy.

5. I was saddened to read this note from Hitoshi Sawada: Due to COVID-19 spread, my retirement-memorial lecture and farewell party in Nagoya University were canceled. I moved to Kinjo Gakuin University, a private women's university in Nagoya, this past April. My new email address is sawada@kinjo-u.ac.jp.

Dr. Sawada has had a long and very distinguished career with many publications, and served for many years as the director of the Sugashima Marine Biological Laboratory. He invited my husband Charles to teach with him at the Laboratory on more than one occasion, and I was very privileged to be invited to do so in 2015. We wish him well in his new position.

6. From Simon Blanchoud (simon.blanchoud@unifr.ch): In our department, almost everything closed during the first wave last spring and our animals got really affected by the lack of care. Since the end of that first confinement, everything got back to (almost) usual working conditions, and the few remaining animals have now happily colonize our entire system. We do have to wear masks if

social distancing cannot be respected, and we do sanitize our hands all day long, but aside from this everybody can work as needed and all facilities are open. Since the second wave, surprisingly enough, nothing has changed except that all teaching has to be done remotely. So we are able to work as close as possible to normal and we're slowly trying to catch up with all the delays that piled up during the first half of this year. We do realize that we are pretty lucky, so we would like to express our support to everyone else!

7. From **Susanna López-Legentil** (LopezLegentils@uncw.edu): All remains the same in N. Carolina and Univ.N. Carolina Wilmington... mostly on-line teaching (except for some labs and courses), covid cases quite stable in Wilmington (raising crazy in the rest of the state), and schools still going on a twice per week rotation (some kids go Monday and Tuesday, and the other Thursday and Friday; everybody is in remote learning on Wednesdays). So far all my family members in the US and aboard are doing well. My graduate student did get covid last month but has fully recovered now. We had to close the lab for 3 weeks, but I am glad to report that the lab has now reopened its doors.

8. Eating *Halocynthia roretzi* may enhance your memory! See the New Publications section, Watanabe et al. 2020.

WORK IN PROGRESS

1. From **Patrick Lemaire** (Patrick.Lemaire@CRBM.CNRS.FR): Following the [recent publication of our work](#) on the 3D + t reconstruction of *Phallusia mammillata* embryos and the analysis and modelling of cell communication during embryogenesis, we commissioned a short animated film in French and English from two Parisian directors, [Laurence Serfaty](#) and [Isis Leterrier](#). The aim was to reach a wider audience and explain our scientific approach to the public. The links to the films are: French version (voice of Laurence Serfaty): <https://vimeo.com/438580822>
English version (voice of Jonathan Weitzman, an epigeneticist that some of you may know): <https://vimeo.com/434433967>

Feel free to share these videos around you if you find them interesting.

2. From **Tatsuya Ueki** (ueki@hiroshima-u.ac.jp): The situation in Hiroshima, Japan, is not so bad. We can do laboratory work almost as usual. [See reference by Nagorny et al. In New Publications]. Regarding the social activity, most academic meetings were postponed or held online. International vanadium meeting, which I regularly attend every two years, scheduled in Cyprus in this November, was postponed to next year due to COVID-19 pandemic.

3. From **Loriano Ballarin** in Padua (ballarin@bio.unipd.it) who sent several new papers: thank you for your continuous effort to keep all of us connected via the simple tool (no technology, no difficult use), represented by "Ascidian News". We are working as usual, even if we have to be careful of the increasing diffusion of the infection and have severe rules for the access to the building.

4. From **Anna Di Gregario** (adg13@nyu.edu): Our lab in NYC has been shuttered for 3 months, during which we prepared and published a review article. [See Negron-Pineiro et al. in the New Publications.]

5. From **Xavier Turon** in Spain (xturon@ceab.csic.es): Here we continue tele-working. I miss the interaction with the colleagues in the lab, and of course I cannot work on taxonomy since I don't have the equipment at home. Lots of script writing and messing with data, but I hope we can return to normal soon.

6. From **Page Valentine** (pvalentine@usgs.gov): I retired on October 1 from the U.S. Geological Survey, but am still working as emeritus in order to finish up a series of substrate maps I have been working on. Our whole lab is working from home, and people seem to like it. We won't be able to return to our offices until WHOI (Woods Hole Oceanographic Institution) opens up, as we are on their campus.

7. From **Noa Shenkar** (noa.shenkar@gmail.com): Our work on using ascidians as biological indicators of pharmaceutical contamination and bioplastic gathered much attention in the media! Here are a few links:

1. Pharmaceutical residuals found polluting marine life on Israel's coasts

<https://www.jpost.com/health-science/pharmaceutical-residuals-found-polluting-marine-life-on-israels-coasts-639341>

2. 'Environmentally Friendly' Bioplastic Just As Bad As Regular Plastic Israeli Study Finds

<https://www.janglo.net/item/rPBOvSpsXgW>

3. 'Environmentally friendly' dishes damage marine environment study

<https://www.jpost.com/health-science/environmentally-friendly-dishes-damage-marine-environment-study-646534>

8. From **Simon Blanchoud** (simon.blanchoud@unifr.ch): We have quite a number of small-scale projects on the stove. Primarily, we're wrapping up a manuscript on our in-lab husbandry setup for colonial ascidians. Animals have had highs and lows, but overall they've been steadily growing in the lab for over 2 years now! In parallel, Laura, a Master student, is starting a proteomic analysis of *Botrylloides* to compare different stages of regeneration with blastogenesis. Margaux, another Master student, is filming colonies to monitor their migration patterns and understand how they move around. Lionel, a Bachelor student, has initiated a large-scale literature review on the description of *Botrylloides* species, and Silvia, a postoc, is following this up with the *Botryllus* ones. Alessandro, another postdoc, is improving our intra-vascular collection technique and combining it with flow cytometry. Ana, a bioinformatician postdoc, is developing a pipeline to study HGT in Tunicates (in collaboration with Stefano Tiozzo), and Sara, a postdoc, is doing some trials to electroporate haemocytes with some of the mRNA constructs used in *Phallusia* (kindly shared by Alex McDougall). Finally, I'm trying to find some time to continue a metabolomic project on recycling during takeover (following up on some suggestions by Lorian Ballarin).

9. From **Delphine Dauga** (contact@bioself-communication.com):

Dear Tunicate Community,

I hope that everyone is doing well in this unprecedented period.

As you probably know, ANISEED is not currently supported by any core funding, as there is no such scheme available in France. The curation of the system, in addition to its general maintenance and new tool development is therefore only possible thanks to the contribution of individual labs from the community. In 2020, the community contributed to obtaining 25,000€ (Thank you!!!). This was in part used to employ Marion Gueroult-Bellone for a short term contract (she is currently halfway through her contract). She curated 21 [articles](#) with 383 experiments (among them 186 in mutant condition) and 35 regulatory regions analysis.

With this message, we would like to invite you to contribute to this effort for 2021.

You can do so as a simple donation if the financial rules of your country allow this. We can send you a receipt. We can also send you an invoice justified with a generic motif such as "contribution to the maintenance of the ANISEED database" or "Contribution to the curation and public sharing of ascidian data". This is for instance what Hiroki Nishida, Billie Swalla, Kohji Hotta, Lucia Manni, Alberto Stolfi and Alex McDougall/Rémi Dumollard did in the last few years. Alternatively, you can justify a financial contribution by the hosting and public sharing via ANISEED of a specific dataset (e.g. a

genomic browser for a genome you have sequenced or a section of the database corresponding to a species). This complies with the FAIR guidelines (https://en.wikipedia.org/wiki/FAIR_data) imposed by most Data Management Plans. This can be planned ahead through the mention of subcontracting to ANISEED in your grant applications. We're happy to provide you with a paragraph. This was done last year by Lionel Christiaen, Simon Blanchoud and Patrick Lemaire. If necessary, we can also prepare a quote and send you a report of the work done with your contribution to justify the payment. To simplify the procedure from your end, you are welcome to put me in direct contact with your finance officer.

Thank you in advance for your contribution, we hope to be able to continue our curation work thanks to you and to continue to employ Marion next year.

PS: If you want to accelerate the incorporation of published article data into ANISEED, so as to make your data FAIR, please fill in this [form](#). We will put your article in our list of items to be curated in priority.

10. From Gretchen Lambert (gretchen.lambert00@gmail.com): In 2013 I was a participant in a huge marine biodiversity survey in Singapore, one of many taxonomists invited from around the world. The manuscript is now in press in *Zoosystema* (see New Publications at the end of this issue of AN). Another manuscript on which I am a co-author concerns the results of an ascidian survey of Puerto Rico harbors and marinas during March 2019. That paper has been submitted. (See M.S. thesis abstract by Olivia Streit in *Ascidian News* #85.)

My younger daughter works at the Fred Hutchinson Cancer Research Center in Seattle, and their labs have remained open on a limited basis; she is able to do much of her work at home online, with a lot of telecommuting and many Zoom meetings. Older daughter is a TV news anchor in Sacramento, California, and does part of her anchoring from a reconfigured corner of their home. In one way or another, people the world over are figuring out how to cope and carry out their jobs in the best ways possible.

11. From Gastón Alurralde (mitocondriarevelde@gmail.com), Tamara Maggioni, Paola Reyna, Anabela Taverna, Clara Rimondino, Emilia Calcagno and Marcos Tatián.

The pandemic situation due to SARS COVID-19 still continues to hinder the normal development of academic and research activities. The university remains closed since March 20th, with access restricted to personnel performing essential activities, such as feeding and maintaining living organisms, or in cases of extreme necessity. There are still no details on the return to the laboratories, so we continue to work from home. In spite of this, lockdown has not prevented us from continuing to work and (virtually) to meet during all these months. [see below]

Although not strictly about ascidians and technically not a formal scientific communication, we had the chance to provide a little space to our beloved animals in an outreach note about mangroves, written by Tamara Maggioni and Jenny Stock. Check it out in the following link!

Title: Los pies descalzos del manglar: Bocas del Toro, Panamá (The bare feet of the mangrove: Bocas del Toro, Panamá)

<https://issuu.com/trimdigital/docs/202011trimnro03?fr=sZGZIODE2NDgzNTM> pages 82-95

We hope all our fellow ascidiologists are in good health and able to carry on with their activities. Greetings from Argentina to all the community of "ascidian lovers"! And we hope Merry Christmas and a Happy New Year to all!!

MEETINGS ABSTRACTS

1. Annual Meeting on Experimental Biology Location: San Diego, CA, USA April 04 -07, 2020

a) Investigation of Wnt pathway genes in a highly regenerative marine invertebrate.

Hughes, J., Ward, V., Jamison, C., Johnson, C., Sumner, J., Keeling, E.

Colonial ascidians are the closest known relatives to vertebrates that retain whole body regeneration. Understanding molecular pathways involved in regeneration in a diverse range of organisms will provide insights into evolutionary changes in regeneration. Specifically, our research explores Wnt signaling in the colonial ascidian *Botrylloides violaceus*; this highly conserved pathway is universally involved in studied animals with any regenerative ability. A recent rough draft genome for *B. violaceus* reveals multiple putative ligands, receptors, and downstream effectors from the Wnt pathway. Primers designed from the draft genome are being used in PCR to validate these predicted genes. Future studies will use qPCR to track gene expression of different Wnt pathway members through regeneration.

b) Hybrid genome assembly of a regenerative chordate.

Sumner, J., Wax, S., Andrasz, C., Anderson, P., Keeling, E., Davidson, J.

Modern genome sequencing technologies open new avenues for research on biological processes in non-model organisms. Colonial ascidians are a diverse group of invertebrate chordates capable of whole body regeneration, an unusual trait that is absent from vertebrates. Although genomic data are available for a few related species, there exist no such data for the highly regenerative species *Botrylloides violaceus*. Using a de novo hybrid assembly approach, we present the first draft of the *B. violaceus* genome sequence. By integrating short read and long read sequencing technologies, genome assembly becomes cost-effective and easily accessible. Comparative genomic analysis between *B. violaceus* and other chordate genomes reveals insights into the evolution of gene families implicated in regeneration and development.

2. IV Reunión Conjunta de Sociedades de Biología de la República Argentina. Septiembre 9-15, 2020. (virtual meeting)

Antarctic ascidians under the impact of glacial sedimentation: physiological thresholds and ecosystem hysteresis. Torre L, Alurralde G (mitocondriarevelde@gmail.com), Abele D, Schloss I, Sahade R.

The seasonal contribution of inorganic sediments derived from the melting of glaciers have a strong impact on the coastal marine communities of the Western Antarctic Peninsula. Understanding the ecophysiological effects of sedimentation on key benthic species is crucial to predicting their success and forecasting changes in community composition in the current context of Climate Change. In Potter Cove (South Shetland Islands, Antarctica), the increase in sedimentation has been identified to be the cause of the communities 'dominated by ascidians' has drastically changed to a "mixed assemblage" dominated by sponges and various infaunal forms such as bivalves or seapens. However, a predominance of ascidians has been reported in areas recently ice-free but subjected to a high sedimentation impact. In this work we evaluate how different ascidians species, highly sensitive to sediments, survive and dominate in these new presumably unfavorable areas. First, we determine whether or not ascidians avoid the impact of sediment somehow. For this, we collected specimens of three different ascidians species (*Cnemidocarpa verrucosa*, *Molgula pedunculata* and *Corella antarctica*) at three stations with different sedimentation regimes. We analyzed and compared the total stomach content and its percentage of organic matter (% MO) to determine the quantity of sediment that they actually ingest. The concentration of glycogen in the mantle was also measured to establish the energy state resulting from the ingestion of foods of different quality. Likewise, for each species we constructed a theoretical relationship between the scope for growth potential (SFG) as a function of increasing sediment concentrations (SFGs). All the species analyzed had a higher total intestinal content with a lower% OM in the station closest to the glacier. The glycogen content between sampling stations is correlated with the intestinal % OM in two of the three species studied. The SFGs estimate would explain the change recorded in the community in the study area and the

current ascidian dominance in the new ice-free areas. However, it is not enough to explain why, under current conditions, in the older areas of Potter Cove the ascidian-dominated assemblage has not been restored, in spite of the fact that sediment concentrations have decreased. The abrupt change and the irreversibility of the system would indicate the existence of alternative stable states. The current spatial coexistence of both states would indicate that the Potter Cove benthic system is in hysteresis.

3. EVOLMAR 2020 - MARINE EVOLUTION, 1° Congresso Italiano di Evoluzione Marina. November 23- 25, 2020. (virtual meeting)

Early developmental stages of native populations of *Ciona intestinalis* under increased temperature are affected by local habitat history. Clutton EA, Alurralde G (mitocondriarevelde@gmail.com), Repolho T.

Aims

High levels of pollutants in anthropogenically-modified marine environments may exert high pressure on maximum physiological responses of sessile organisms acting as powerful agents of selection. Thus, an organism's acclimation or adaptive potential could play an important evolutionary role by enabling or conditioning species tolerance to stressful environmental conditions. Temperature modulates marine ectotherm physiology, influencing survival, abundance and species distribution. While native species could be susceptible to ocean warming, thermal tolerance might favour the spread of non-native species. Determining the success of invasive species in response to climate change is confounded by the cumulative, synergistic or antagonistic effects of environmental drivers, which vary at a geographical and temporal scale.

Methods

We investigated the developmental performance of early life stages of the ascidian *Ciona intestinalis* (derived from populations of anthropogenically-impacted and control sites) to an extreme weather event (i.e. marine heat wave). Fertilisation rate, embryo and larval development, settlement, metamorphosis success and juvenile heart beat rate were assessed as experimental endpoints.

Results

With the exception of fertilization and heart beat rates, temperature influenced all analysed endpoints. *C. intestinalis* derived from control sites were the most negatively affected by increased temperature conditions. Oppositely, *C. intestinalis* from anthropogenically impacted sites showed an overall positive response to thermal stress, with a higher proportion of larvae development, settlement and metamorphosis success being observed under increased temperature conditions. No differences were observed for heart beat rates between sampled populations and experimental temperature conditions. Moreover, interaction between temperature and populations was statistically significant for embryo and larvae development, and metamorphosis.

Main conclusion

We hypothesize that selection resulting from anthropogenic forcing could shape stress resilience of species in their native range and subsequently confer them advantageous traits underlying their invasive potential.

NEW PUBLICATIONS

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