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# Bulletin

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Further information at http://www.bryozoa.net/iba/index.html

## NEWS FROM THE MEMBERSHIP

**Jean-Loup d'Hondt** - After having founded in January 1968 and directed since then, that is to say for a little more than 53 years, the Bryozoans service of the National Museum of Natural History of Paris, I will definitively leave this establishment on April 20, 2020. From this date, I will spend each year 8 months per year in Paris where my main residence will remain and where half of my scientific library will be stored, and 4 months per year in the countryside, in Périgord, where the second half of my library and where I set up a small laboratory. I will remain active as long as possible, but I will now limit my areas of interest, on the one hand to Ctenostomes, on the other hand to the development and anatomy ("soft parts") of Bryozoans. I would therefore be very happy to continue receiving publications in these two areas. My e-mail address will remain unchanged for the time being. Mail should now be sent to me at 92, rue Jeanne d'Arc, 75013 Paris.

**Consuelo Sendino** is working on a project to record SEM photographs, on a worldwide map, of all of the Quaternary and Recent bryozoan specimens kept in museums which are participants of the Synthesys Scheme; this is in order to help with bryozoan taxonomic identification. For this, all the specimens will be georeferenced and a type specimen or the best specimen of each species will be scanned under a scanning electron microscope (SEM). This information will be displayed through the museums' websites with links to their associated partners on this project. For this she is coordinating the following institutions in the current SYNTHESYS+Virtual Access Call: NHM-London, Hebrew University Jerusalem Museum, National Museum of Natural Sciences- Madrid, Naturkunde and NHM-Vienna.

This project has had the support of the IBA Council and will be very useful not only for taxonomic reasons, but also for climate change studies and evolution of the bryozoan group.

**Andrey Ostrovksy** - *Cristatella mucedo* genome and transcriptomes sequenced! After three years of work we were able to put the main results of our ongoing project as preprint at the bioRxiv. It is a raw MS, mentioning the main pieces of our work, and we will do our best to finish a paper this year.

https://www.biorxiv.org/content/10.1101/869792v1.abstract

Our preprint presents a high-quality genome assembly of *Cristatella mucedo*, a unique freshwater bryozoan with mobile colonies, making it a first sequenced genome of the phylum Bryozoa. Using a combination of different sequencing platforms, such as PacBio, Oxford Nanopore, and Illumina, we were able to obtain assembly with N50 of 4.1 Mb. Comparative genome analysis suggests that, despite larger genome size and higher number of genes, C. mucedo possesses a less diverse set of proteins compared to its immediate relatives. This might be a result of genome degradation due to niche and sedentary lifestyle, or because of increasing reliance on symbiotic bacteria to produce necessary metabolites.
Gene family and pathway overrepresentation analysis were used to find candidate targets involved in bryozoan nervous system and locomotion. We used RNA sequencing to identify genes upregulated in various parts of the colony, as well as during the differentiation from frozen statoblasts, and validated several of these targets using in situ hybridization.
Altogether this makes *C. mucedo* a new perspective model to study bilaterian relationships, evolution and development of modular organisms, as well as colony integration processes. The presented C. mucedo genome and transcriptomes, together with the comparative genomic analysis, provide an insight into lophophorate evolution and modular body organization.

Here are the links to the *Cristatella mucedo* genome at the NCBI
https://www.ncbi.nlm.nih.gov/genome/?term=Cristatella+mucedo
https://www.ncbi.nlm.nih.gov/assembly/GCA_009760855.1/

Additional research including in-situ hybridization to show the selected genes expression and phylogeny construction is underway.

**Teresa Madurell and Mikel Zabala** - We are happy to share with you the collection of recent bryozoa from the Mediterranean https://www.bioexplora.cat/WIKICOLLECTA/index.php/en/briozous. The collection is held at the Museu de Ciències Naturals, in Barcelona https://museuciencies.cat/en/ and it has been compiled from specimens collected mainly in the Catalan Sea (NW Mediterranean) after several research projects lead by the Institute of Marine Sciences (ICM/CSIC) and the University of Barcelona (UB) by Teresa Madurell and Mikel Zabala.

It consists of more than 500 specimens corresponding to ca. 300 species. For each species a comprehensive collection of SEM pictures is provided, trying to represent the most discriminant characters (colony, zooid, heterozooides, avicularia, aperture, ovicell…). Each specimen in the collection is properly documented with location, depth, collector, type of sample, and habitat. For each species and where available, we present additional data links to original description, type location, latest description, and other relevant links such as WORMS, GBIF, IBA, GENBANK and to other reference collections such as DORIS and NBNATLAS.

The overall objective of the reference collection is to provide the scientific community and the general public with a SEM photographic catalog, and distributional data on the Bryozoan fauna from this area of the Mediterranean Sea. Until now we have uploaded the data for one hundred species, and we are still improving several aspects and bugs, however we are pleased to invite you to check the result and share any feedback you may have. We have identified the specimens according to our knowledge, so if you find inconsistencies we welcome your expert contribution (please contact us through the website or by email). We hope this collection is helpful for you too ;)

## IMPACT OF COVID-19 ON IBA MEMBERS

**Juan Suárez** - As some of our colleagues know, I earn my living being the head of a civil engineering lab, which is a very peculiar way for an IBA member. That means that I store and prepare my specimens in my fully-equipped (or kind of) 10 $m^2$ storage room, one of my bedrooms has always been an office for my wife and I, and prepared specimens stay there until a paper gets published and the time is come to deliver them at the Museum with great relief. About the microscopes, well, everybody uses the big table at the dining room for that purpose, or do they? So, my usual circumstances as a bryozoologist will make it easier to pass this mess. In fact, I have been working in my "other" job normally even since the alarm was declared in Spain several weeks ago, so I was affected by confinement only after work and during the weekends. On March 28th, our Government ordered to stop every activity except for those considered strictly essential, building activity will stop until the end of Easter. More time for bryozoans! The only trouble is that movement has been severely restricted, so no field work for me. I have ordered some putty to embed my small specimens before sectioning just in case I run out of it, but now I am not sure when I will receive it. I have a project going on and keep touch with my colleagues, this will keep me busy enough for the next two weeks.

Sorry, I have no recipe for keeping a decent mental state, isolated or not, and I am usually happy with some degree of isolation. Well, that might explain some things, now that I come through it. You might try following some routines to keep your mind busy, and also to keep your body active, but don't be too strict, indulge yourself. I have heard these days that online work with children and pets in home confinement following some gym tutorial puts your adrenaline up to risky values, so be careful. I prefer something more peaceful, my wife and I are archers, and we train at home to keep fit. Obviously, only moving the bow, no arrows!

Now, seriously, I am sending my best wishes to all the IBA membership. I live in a country that has its healthcare system almost collapsed by the great amount of people needing attention everyday due to the high number of infections. Please be extremely careful and help yourselves to prevent infection. Isolation is necessary to avoid infecting and being infected, and that is the only thing we can do to help our health workers help us. Hugs (virtual) for all, we'll meet again.

*Best, Juan*

**Aaron O'Dea** - Good morrow bryozoan community, in August 2019 my family and I took a sabbatical from the Smithsonian Tropical Research institute in Panama to spend a year at the University of Bologna. Unbeknownst to us at the time of our decision, Northern Italy has became the epicentre of the pandemic. But by the time this goes "to press" the concept of an "epicentre" may well be moot. In early February, we hosted a Conservation Paleobiology symposium in Bologna - https://spark.adobe.com/page/Ffnuc5r9hxepo/ - just before it all went awry. Jeremy Jackson gave a Keynote and Farideh Moharrek gave two great talks on exploring evolutionary patterns in bryozoans with fossils and molecules.

We've been in some form of lockdown for over a month now. I lost count. The days cooped up inside have blurred into one. The rules here are strict - we can see the local park from the balcony but we can't visit. Our kids have been off school since mid-February and the most challenging thing has been trying to supervise their schoolwork, keep them from marmalising each other, and attempt to work. My tip would be to go easy on yourself and lower your expectations.

I've been looking fondly at old photos of fieldwork. Daydreams take me back to the Caribbean Pliocene, hunting for fossil cupuladriids. The good news is that those fossils are not going anywhere. While my colleagues have had to heartbreakingly euthanise their study organisms, palaeontologists can at least bide their time.

Hoping everyone in the community is coping well. I'm looking forward to hearing from you all,


*L -view from the top of the "Specola" in Bologna before the lockdown. R -Neptune waiting for normality to return.*

*Photo from the top of our apartment looking for something to do in lockdown*
*Aaron*

**Leandro M Vieira -** Sabbatical (Visiting Professor) in Europe. This year I was awarded by two scholarship, one from the CAPES Foundation (Young Visiting Professor) to conduct at Natural History Museum with Andrea Waeschenbach and Mary Spencer Jones (from March to July 1st), and a JESH grant by the Austrian Academy of Science for a period of 6 months, to work with Thomas Schwaha at University of Vienna (from July to December 24, 2020). My wife (Leila) and I have arrived safely in London, fortunately (or unfortunately, who knows how long will be taken?!?) before the coronavirus lockdown in the city. Unfortunately the NHMUK was closed until further notice, but I have discuss strategies with Andrea and Mary, to do homework on different topics on bryozoans during my visit (taxonomy, phylogeny and the Treatise on Invertebrate Paleontology, Part G (Revised): Volume 3: Bryozoa: (Cheilostomata)). We're working on the spreadsheet to help with the organization of the Treatise, to include data of each cheilostome genus and, thus, to fill in WoRMS website (as discussed in the last IBA). Mary is doing a fantastic job photographing all cards with generic names cards deposited at the NHMUK. Don't be surprise if we contact some of you to ask help with any data, including SEMs of genotypes.
Best and keep safe.

**Hans Arne Nakrem** - Dear all bryozoa friends, we are fine here in Oslo, no problems at the museum, but of course, we have "home office" and no contact with the rest of the university/museum. The government closed down the universities (and schools) in Norway 12th of March and since then we, and students, have had no access to our facilities. I have access to the museum, to books and other material, but in general I have to stay at home. Makes some time for writing and planning teaching. All exams will be digital, and I am responsible for a couple of Phd disputations in April and May. I suppose this will work out fine.
Many of you know our son Magnus, who is doing his medical duties at the Oslo University Hospital, now actually taking part in a research project on corona. He and his family are well, our two granddaughters are just perfect, but we are of course sad that we cannot see them every day (they live just some 30 minutes by foot from us....).

All the best to you, and your families. Take care, and stay healthy - and stay at home, isolate yourselves and your families, and then we will manage to survive all this.

*All the best from Eva and Hans Arne*

**Dennis Gordon** - We have been in lockdown in New Zealand since Thursday 26 March, though for me it was earlier (22 March), being over 70. So, I have been at home for two weeks now, apart from some short walks. But our property is big enough for exercise, mainly through grounds maintenance. I am with Brenda and our 27-year-old intellectually handicapped third son Adrian, who had to vacate his shared flat because there is now no physical support. I was able to retrieve a microscope from work and, thanks to Phil Bock, have PDFs of all the publications I need to carry on writing papers. In between science I have been playing Dragonball-Z Monopoly with Adrian. He beat me twice (must have been my great investment advice) and now we are working on a Wasgij puzzle.

One unexpected highlight for me as a celebrant was performing an e-wedding. A widow in our church was to have been married on 4 April, but owing to the rapid escalation of COVID-19 Alert Levels in New Zealand, she decided to bring it forward, and scaled right back - no other attendees because she herself was in her seventies. So it was done by Skype, with my wife as one witness and the ceremony was recorded for a second witness to view the next day. Signing of forms was achieved by scanning and emailing documents and one sent to the Registrar of Marriages. One week later she received the formal acknowledgement of marriage from the Registrar. It was a very amusing and happy experience.

*Take care! Dennis & Brenda*

**Maja Novosel** – Dear all, to me it all started at February 28th with the explosion of big meteor above Zagreb. It was really impressive and loud. Then Covid came and Andjelko, Ana, grandma and me are isolated in our house. Luckily we have big garden and it never looked so nice as it look these days. We are struggling with Ana to make her to watch school on TV(!) and have piano lessons via mobile phone.

Then, early in the morning at March 22nd an 5,5 earthquake hit Zagreb and 30 minutes later another one 5,0. Since then we are shaking all the time... Beside we were (and still are) very scared, luckily our house is fine. But many people lost their homes and centre of Zagreb is terribly hit. My University is heavily damaged, but my office and all bryozoans are fine! Then, the same day when earthquake hit - a snow started to fall and strong wind for two days destroying damaged houses even more.

Then, at March 27th, the sky looked very strange: they told us Zagreb is at the moment the most air polluted city in the world and advice everybody to stay inside and not open windows. A large cloud of yellow sand from Karakum desert (Central Asia!)stayed above us for for 3 days.

I sincerely hope no more bad news from me.

Many, many regards to everybody,

*Maja*

**Antonietta Rosso** - I started my lockdown on the 9th of March and now is about 1 month I am confined at home having gone out only twice for catching food and other goods ... The rule is resilience, isolation, smart working, that is relatively easy for me in this period because I have no courses in the second semester. Anyway, I experienced new platforms to do examinations, a strange modality without fossils at hand... Further activities such as writing and reviewing are luckily possible staying home.

And, fortunately, I also live in a small village and I have a relatively big garden where a lot of work is needed and early spring intermittently offers nice sunny days to stay out gardening. Now we can only be responsible and obedient, respecting rules and staying home, hoping that all this can reasonably pass as soon as possible, without injury for all of us and our beloved and all people in the world.

*Best wishes*

*Antonietta*

**Abby Smith** - Just a quick note to say we are firmly locked down, but quite okay. We were able to get both our sons home before the final lockdown, so there are four adults working away in strange-looking little “offices” tucked around the house. We really appreciate having their company – all of us are taking our turns cooking and cleaning etc.

We have been becoming technologically advanced very quickly! A great on-line game package is called Jackbox – our overseas family and we meet once a week to chat and play games together. My crafting women are knitting together on zoom, our quiz team has figured out a way to challenge each other, we even hosted a surprise birthday party last week!

Despite being perfectly well, able to go for lovely walks, and exceptionally well-fed, we still feel a bit isolated and sad sometimes. Nevertheless, this global crisis has certainly sharpened observational skills and our senses of gratitude for the things we do have.

Very much hoping you are all keeping well and safe.

*Abby*

**Catherine Reid** - Likewise locked down here in Christchurch, fortunately we are still allowed out for exercise, and I don’t like shopping at the best of times so no problem there. I also have a garden, and the wonderful company of my dog Ruby. Unfortunately this is my busy teaching term, with a class of 65 to teach carbonate microscopy and fossil identification to, and devising activities and assessment to lead an 8 day 3rd year field trip from my home office! All resolvable (sort-of) but it takes time. My initial plans of “writing next week” are evaporating. Our university is closed to all staff and students, and research students, but hopefully will open for staff and research students in the next few months. New Zealand has just tightened its borders for everyone, New Zealanders included, and these look likely to be in place for a long while yet. My end 2020-21 sabbatical is now most definitely a “staycation”.

Kia kaha, *Catherine*

**Andrey Ostrovsky** - Hi, bryofolks! I wish you all (and your families and friends) will be well in these strange times...
A month ago I came to Russia for the spring semester teaching and stuck here, while my family is in Austria. Oh, well, my son told me yesterday via Skype that I am lucky to be in St Petersburg, because my wife Tanja was forced to close her school. She is in such a mood now that if I would stay with her in Austria, I could be easily the first victim of the virus in our family :-)

In St Petersburg we shifted to the distant education too, and people hate this method. Otherwise, I visit my university 2-3 times per week just to see that all our protists cultures and other laboratory animals are ok. St Petesburg looks very empty, probably like your cities/towns. We have no a strict quarantine, but most people prefer to stay home. No problems with food or transportation. All summer field works with the students will be probably cancelled, and this is bad. At home I prepare my lectures and write and review papers for which I normally have few tie when teaching. Another positive aspect, I could sleep a bit more than normally :-)

Else, those who attended the Liberez conference, could remember a talk of my student Nadja Karagodina about bryozoan bacteriphages – viruses associated with bryozoan bacterial symbionts. At the moment we found two different viruses in *Paralicornia sinuosa* from Australia, *Bugula neritina* from Florida and Spain and … just last week – in *Paracribricellina cribraria* from New Zealand that Abby sent to Austria few years ago! Australian and New Zealand viruses are VERY SPECIAL and superficially look like Coronaviridae (but they are not). So, we need more fresh material fixed for both TEM and molecular analysis!!! :-) So, we come to you to catch this bryozoan virus!!!
*Big hug, Andrew*

**Marcus Key** - My family and I are all well so far. Maria and I both have to work from home now. Our three oldest children are all well in San Diego, Boston, and Philadelphia. Our two youngest are home with us taking classes on line. Our 20 year old was studying in Rome this semester but had to come home early. He has no symptoms. I started teaching online classes a couple of weeks ago for the rest the semester. All economic activity here has come to a halt as we all sequester at home. We are playing a lot of board games, going on hikes, and Maria is sewing face masks. Hang in there everyone!
*Marcus*

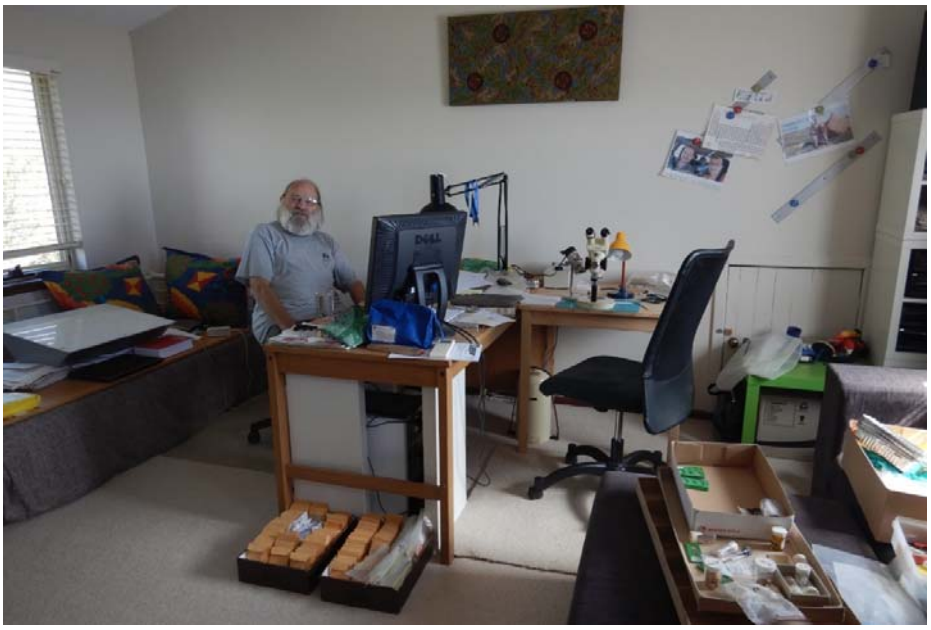
**Caroline Buttler -** I'm also at home, the Museum closed a few days before the UK wide lockdown. This has come after our Head of Department retired at the beginning of the year and before any replacement had been advertised, therefore the couple of us who temporarily took over the job are doing it in somewhat strange circumstances. We only had one very hectic day to sort out everyone to work at home and we are going to have no access to the museum at all during the lockdown. I'm on rota as a duty manager and thought I would have to go in but it has been decided that we will now do this remotely. I brought my office plants home, one is looking distinctly unhappy at the change of scene! However I'm getting very good at Zoom meetings!

The children have come home from London for the duration so we are all finding spaces to work, we were in the middle of re-decorating but that has been put on hold. My daughter is a freelance musician and music teacher so all the shows and weddings she had been booked for have been cancelled but she is still managing to teach some of her private pupils by Skype. It's the longest they have been home for years!

The weather at least is lovely so it's been nice to get in the garden at lunchtimes - I can go check on the progress of my tadpoles in the pond.
*Best wishes*
*Caroline*

**Eckart Håkansson** - we are all more or less in the same situation: working at home, with infrequent short trips out into the dangerous ambience. But maybe this situation will actually boost the number of bryozoan papers in the near future - much like the WWII curfews boosted the production of babies in many countries. Such as me, for instance😁.

After our son married and set up his own household in December I immediately invaded his vacated space and started setting up a home office/lab [see below] - not because of any particular sense of what was to come down, rather to be prepared for a possible age-discriminatory eviction from my office space at UWA. So I'm actually well set up to get some work done - trying hard to avoid the temptations of just being cosy, binging on TV-series and eat too much, now that Lena is also working from home. The fact that she broke her arm a couple of weeks ago doesn't help either, expanding my service role a bit.



With respect to the CV-19 virus, Australia has so far avoided the worst effects, with rather low numbers of affected people nationwide [reaching 50 deaths today]. The far majority of diagnoses relates to people who have acquired the virus directly on trips abroad or after direct contact with returning people, and the main concern is really the fleet of [rather obnoxious] cruise-ships, that seems to be very attractive to many Australians - more than one quarter of all deaths in Australia are people from a single cruise-ship allowed to disembark 2,500 passengers into the community before the results of CV-19 testing became available (*Editors note – this same ship is responsible for a cluster of cases in New Zealand*) - and there is still a bunch of these ships around our shores trying to offload passengers and crews.

But luckily most of the unpleasantness relates to the other side of the continent - so right now the remoteness and isolation of WA and Perth is really a blessing of which we are acutely aware. So now Western Australia has been sealed off to the world [& the rest of Australia]. The 'No leaving & No entering' order doesn't mean a lot to the average person [we, for instance, have 1,500 km to the nearest border and 3,250 km to the only other road border] but, unfortunately, the added 'No leaving your local region' order seriously prevent any relevant field-work [and, as some of you know, you can do a lot of field-work in WA without ever seeing anybody else].

So, have as much fun as you possibly can - stay safe - and write them papers!!

*Lena & Eckart*

**Jo Porter** - Hi to all my IBA friends, it is very quiet here in Orkney on lockdown. So far we have 4 positive cases in our population of 22,000 and we hope that the numbers stay low as there are no intensive care or high dependency beds here. If anyone gets seriously ill they have to be transported by airlift to the Scottish Mainland. I closed down the Orkney campus three weeks ago and since then the staff and students are all working from our homes mainly in Stromness and we are doing a lot of online calls to keep in touch and to work collaboratively on our teaching and research projects. We have developed an online writing club, meeting each weekday morning from 10-12 and also some virtual tea and biscuit breaks which are well attended.

I am at home with Rob and our dog Monty. We have started work on a new garden vegetable plot so there is a good amount of digging to be done just now. We are allowed to have one exercise per day and so this mainly involved walking with Monty. Luckily the population of Orkney is quite small so we can easily distance ourselves as per the regulations. It is very strange because usually this is the start of the Tourist season and we expect a big influx of people around this time of year, everywhere is quiet instead. No cruise ships coming in and all of the tourist sites closed. All of the festivals cancelled. It is hard for local businesses who rely on the tourism. The fishing boats are mainly tied up because there is no demand by restaurants in the cities for the shellfish.

My parents are down in Staffordshire in full isolation as they are over 70 and my brother is bringing food to them. I am looking forward to seeing them again when it is safe to do so. It’s lovely to hear from everybody and I wish you all the very best,

*Jo*

**MEETING REPORT**

# AUSTRALARWOOD 2020

*Catherine Reid*

Finally on the third attempt, it was my great pleasure (and relief) to host an Australarwood meeting in Christchurch. The first attempt in March 2011 was scuttled by the February 2011 Christchurch EQ, and the second in February 2017 by the delayed earthquake induced closure of the Kaikōura field station where it was to be hosted (and sealed by the Kaikōura Nov 2016 earthquake) after which Dennis kindly hosted at short notice in Wellington. So scraping under the wire of COVID-19 the 9th Australarwood was held at the University of Canterbury on the 27-28h February 2020.

The meeting was attended by thirteen keen bryozoologists, and timed to coincide with the Oslo funded contingent being in New Zealand for field work. Talks were held on the Thursday on campus followed by a late afternoon visit to the Canterbury Museum and the Squawkzilla exhibition of New Zealand giant Paleocene penguins and giant Miocene parrots. After the exhibition we wandered down the road for pre-dinner drinks, and a fabulous dinner in town.

9th Australarwood attendees outside the Canterbury Museum- *back row L-R* - Michèle Prinsep, Paul Taylor, Emanuela Di Martino, Mali Hamre Ramsfjell, Catherine Reid, Yuta Tamberg, Phil Bock, Peter Batson. *Front row L-R* – Dennis Gordon, Eckart Håkansson, Lena Madsen, Abby Smith, Margaret Bock. *Photo – Abby Smith*

The following day we set off for a field trip to the Waipara Valley in the sunshine and a forecast 30$^{oC}$. The first stop was targeted at early Miocene Whiterock limestone in the Whiterock quarry at Loburn. Paul and Dennis had visited many years ago and found good bryozoans encrusting the bases of large *Celleporaria* and were keen to try again. The large *Celleporaria* are still there but unfortunately they are no longer as well exposed, and very few bryozoans were found. However with numerous sets of eyes looking at least we know we tried. From there we went northeast to look at the same unit at Claremont Estate farm in the Waipara Valley, outcropping in a farm paddock. Here the unit is much

coarser grained and better exposed and bryozoans were successfully collected. As can be typical in Canterbury on a warm day the wind picked up and drove everyone back to the vehicles, aided by knowing the next stop was a winery. The day was finished in the sun (out of the wind) sampling wines at Boneline vineyard with cheeses and nibbles.


Top left – Emanuela Di Martino looking and Dennis Gordon wondering where all the *Celleporaria* went, top right – Eckart Håkansson. Bottom left – Dennis Gordon and Phil Bock at Claremont as the wind picks up. *Photos from Paul Taylor.*

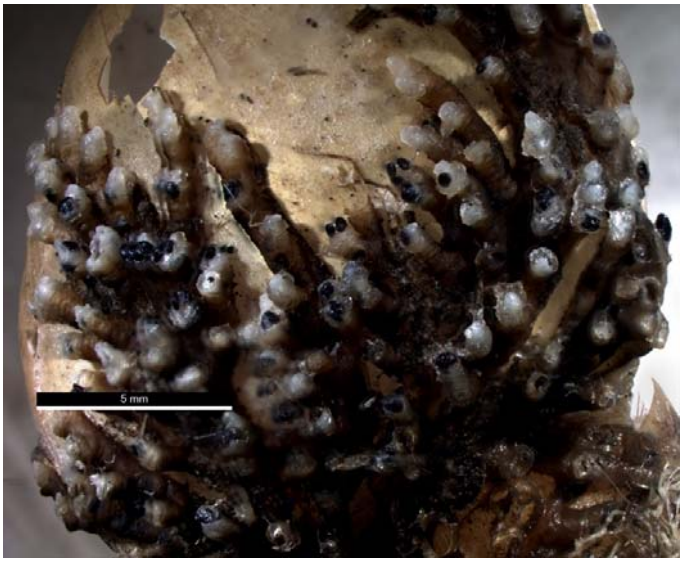
**ARTICLES**

# FINDING PHYLACTOLAEMATA AT THE NORTHERN POLE OF COLD

*S.A. Kuzmina [(1)], E.I. Izumova [(2)], A.V. Vinogradov [(3)]*

1 - Borissiak Paleontological Institute, Russian Academy of Sciences, Moscow; 2 - Severtsov Institute of Ecology and Evolution, Russian Academy of Sciences, Moscow; 3 - Samara Regional Branch of Russian Ecological Academy

Interesting specimen (fig. 1) has been found near Batagay town [Verkhoyansk Region, Yana Highlands, Yakutia (Sakha), Russia]. The main goal of our fieldwork was geological study of the Pleistocene section Ulakhar-Sullar at Adycha River but also we made efforts to collect modern insects and freshwater invertebrates. A number of fossil Phylactolaemata statoblasts have been found there including *Cristatella mucedo Cuvier* (fig. 2). Numerous fossil insects, crustaceans, leech cocoons, etc. were discovered in the section; this material is in study. The region is very important in the sense of understanding of evolution of the Pleistocene steppe-tundra community due to existing of the modern steppe patches which could be considered as a modern analogue of an extinct Pleistocene treeless xerophilous community.




*Left Fig. 1. Recent* Plumatella emarginata *Allman on the surface of a gastropod* Lymnaea *sp. shell. Right Fig. 2. Fossil statoblast of* Cristatella mucedo *from the Ulakhan-Sullar section, Middle Pleistocene.*

Two members of the team E.I. Izumova and S.A. Kuzmina tested all accessible water bodies of the area in August 2019 using common plankton net. All together we took samples from 11 sites near Batagay town and Betenkes village. The Phylactolaemata was recorded in one sample. It comes from an oxbow of the Yana river located at 67.65008 N, 134.61076 E inside Batagay town (fig. 3). The *Plumatella emarginata Allman, 1844* created a colony (zoarium) on the surface of the shell of alive gastropod Lymnaea sp. (fig 1).

According to observation of A.V. Vinogradov (1986, 1989, 1992, 2000, 2011) the record of Sakha Republic (Yakutia) includes 5 species of Phylactolaemata: *Fredericella sultana sultana*, *Plunatella fruticosa, P.fungosa, Hyalinella punctata, Cristatella mucedo* and 1 species of Bryozoa (Eurystomata) – *Paludicella articulata*. Now we can add the new for the region species - *Plumatella emarginata* to the record.

Verkhoyansk Region belongs to Yana subprovince of the Kolyma biogeographic province of Beringian subregio of Palearctic regio. It is situated between Indigirka subprovince of the Kolyma biogeographic province and Yakutia subprovince of Lena biogeographic province. In the Pleistocene the whole area except highlands was ice free. The area provided a migration corridor from southern steppe to the northern steppe-tundra in the Pleistocene. Relict species could survive in some habitats here.

Verkhoyansk Region is one of the coldest places in the Northern Hemisphere. The climate is very contrast: with long cold winter and short but relatively warm summer and low amount of precipitation. The climate data from the Batagay weather station indicate a mean July temperature of 15.2ºC, mean January temperature -42.4ºC, mean annual temperature -13.9ºC, and annual precipitation 153 mm (Melnikova,1965). Verkhoyansk town at the Yana river witch is situated not far from Batagay competes with Oymyakon town at Indigirka river as Northern Pole of Cold. The temperature record from both places shows the same minimum temperature – -67.7ºC.

*Fig. 3. Oxbow («staritsa», meander) of the Yana river in Batagay.*

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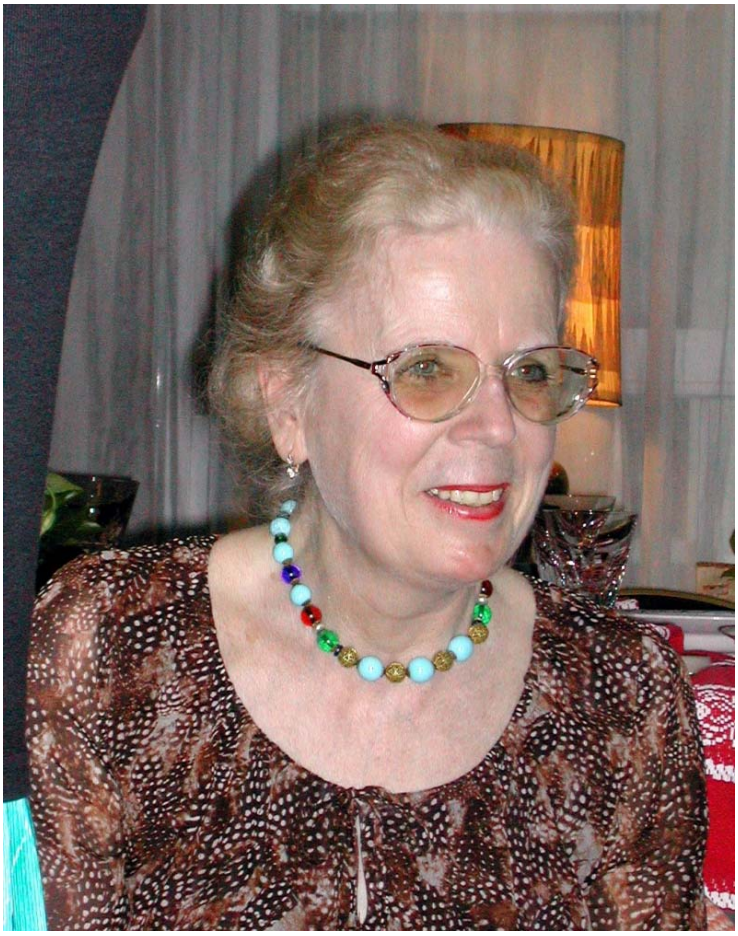
**IN MEMORIUM**

# FRANÇOISE BIGEY (1941–2019)



*Photograph courtesy of Paul Taylor*

Françoise Paule Bigey, died following a fall in her second home in Juziers (Yvelines) where she normally spent every weekend and whenever she had a few days off in a row. She enjoyed herself very much in this country house which she had inherited from her parents. Situated 45 km from Paris and 10 km from Mantes-la-Jolie, and overlooking the course of the Seine, there she relaxed and passionately maintained its vast sloping garden and its fruit trees on the hillside. She would commute to the house in a succession of cars, the first of which were sports cars, which she enjoyed driving fast but carefully.

She was raised in a traditional Catholic bourgeoisie family, in a loving, but rather strict and rigorous environment, the only daughter of a renowned obstetrician from Paris and a watercolour painter. Her parents owned, in addition to their apartment in the capital and their villa in Juziers, an apartment and a pleasure yacht on the Mediterranean coast, in Juan-les-Pins, a seaside town where she participated in, and won, swimming competitions. They also owned several rental apartments in the capital (which they sold when their tenants vandalized them after Françoise and her mother asked them to vacate the premises after several months of unpaid bills).

Each year the family made one, or maybe more, long trips abroad, to different countries, most often to Britain, which enabled her to gain a good fluency in English, rather better than that of many of their colleagues. She continued to enjoy travelling throughout her life, not only privately but also as part of her professional activities, taking the time to visit museums, famous monuments or tourist sites. She had shown great interest in the Guggenheim Museum in Boston during the IBA congress in Woods Hole in 1977, was enthusiastic about flying over the Niagara Falls during the Franco-Canadian zoology congress held in Montreal in 2005, and became transfixed by the geysers of Yellowstone Park visited during IBA congress in Bellingham. During the Boone IBA geological excursion she was delighted to be brought to view an Eiffel Tower in Paris, Tennesse, noting slightly caustically that it was rather small! Seeing brought

back memories to some participants of that trip of the splendid IBA conference dinner of 1989 that she had organised in an excellent Parisian restaurant that provided a sumptuous view of the real Eiffel Tower.

The death of her parents had affected her greatly, but she had faced it with courage and had shown great dignity at the funeral ceremony for her mother, her last close relative. Following this, for companionship she adopted a cat who regularly made journeys with her between Juziers and Paris in her basket.

From a very young age, Françoise was passionate about Earth sciences and was encouraged by her two prestigious mentors during her university studies, the couple Henri Termier (1897–1989), sedimentologist and professor of geology at the Sorbonne, and Geneviève Termier (1917–2005), palaeontologist and specialist in Permian gastropods and brachiopods, an affable research director at the CNRS whose competence and kindness impressed everyone who approached her. On their advice, Françoise embarked on studies of Devonian Bryozoa which she steadfastly maintained throughout her teaching and research career at Pierre and Marie Curie University in Paris. She was well-placed to carry out this work on bryozoans from this period given their distribution in France. It would be true to say that studies on Devonian bryozoans in the last fifty years have been overshadowed, numerically, by studies of faunas found in other Palaeozoic periods. Françoise championed their study and made a considerable and valuable contribution to our understanding of these Devonian taxa which has allowed for their integration into recent syntheses of palaeobiogeography and taxonomy. She was honoured in the name *Bigeyina* Suarez Andres and McKinney, 2010.

As part of her activities, she regularly went to the field, visiting many type and other localities to collect material requiring new studies or re-evaluation. She was also responsible for the laboratory's collection of fossil invertebrates, and provided students with essentially practical instruction. She participated in numerous geology and paleontology congresses in a large number of countries, and one of her pleasures was writing detailed reports on these trips following her return.

For her research she prepared the thin sections of her specimens and samples herself. Her bryozoan studies led to publications on the ultrastructure of Devonian trepostomes, accounts of various assemblages from France, as well as further afield from Afganistan and Morocco, and descriptions of several new taxa. In the IBA volumes she published a series of papers on Devonian bryozoans: these papers included treatments on taxa from Armorica (1972), cryptostomes from Montagne Noire (1975), overgrowths on trepostomes (1981) as well as a valuable assessment of the biogeography of Devonian taxa (1985).

She was generally interested in all fossil bryozoans and, her depth of knowledge of the group and their distribution in France was demonstrated when the excursions for the 1989 IBA Congress were being planned. During reconaissance trips she introduced J.-L. d'Hondt with great erudition to the outcrops rich in bryozoans from Anjou and Touraine.

In her career she preferred to maintain as much freedom as possible and to have few academic constraints. As a result she chose not to defend her thesis when she had plenty of research to write up, and she stayed at the rank of lecturer. After her retirement from the university, she became a volunteer teacher-researcher, with the title of Attaché, at the National Museum of Natural History in Paris where she managed part of the invertebrate collections. In 2009, when J.-L. d'Hondt became president of the Société zoologique de France, she agreed to help him and served as Treasurer of the Société.

She was a long-time member the IBA which she first joined in 1969, and participated in the second conference held in Durham in 1971, which was the first of two organized by Gilbert Larwood. Prior to this she had made contact with the French palaeobryozoologists active in the universities of Lyon, Paris and Bordeaux, but it was only through her participation at the IBA Congress in Lyon in 1974 organised by Louis David that she got to know the biologists working in France on living bryozoans (G. Lutaud, J.-G. Harmelin, J .-L. D'Hondt). It was during that meeting that she obtained many specimens from them collected through diving around the Frioul Islands, near Marseille.

She served several terms on the IBA Advisory Council, and participated in all the meetings of the IBA from the 1971 meeting held in Durham to the 2013 meeting in Catania. When J.-L. d'Hondt considered organizing an IBA international congress in Paris on the occasion of the bicentenary of the French Revolution, she immediately agreed became involved. With typical generosity, given her good fluency of English, she took over most of the organization for the

meeting which involved considerable correspondence with international colleagues. She also prepared the geological part of the excursions, and scrupulously edited a significant portion of the ensuing conference volume.

She admired the quality of Judith Winston's work and greatly appreciated the innovative ideas, openness and culture of Thomas Schopf, as well as his efforts to promote the study of bathyal and abyssal bryozoans. He became a close friend, and on his premature death in 1984 she and J.-L. d'Hondt collaborated on a commemorative notice in his memory.

Always very elegant, poised, she loved to go to good restaurants where she greatly enjoyed a glass of whiskey before each meal. She was passionate about shows, and loved great music, and attended performances several times a month in theaters (including the Comédie Française), the Paris Opera, or large classical music halls, to the point of sometimes having to limit her spending on other activities toward the end of the month. Her interests also extended to varied aspects of culture, and she did not miss any of the temporary exhibitions organized in major Parisian museums.

At the IBA conference in Woods Hole, she bought a number of representations of golden metal horseshoe crabs as gifts for her family and friends. From a religious background: several members of her family had been nuns, she remained very religious, a practicing Catholic who respected the values of integrity and righteousness of religion, and she engaged in various aspects of social work. At one IBA meeting she insisted on attending Mass despite the attempts of several colleagues to dissuade her doing so. Unfortunately she was stabbed (fortunately not badly) at the entrance of the church by a group of teenage girls aged between 10 and 12 who tried to steal her purse, passport, and especially her money.

She was very demanding of herself as well as of others, sometimes could be intolerant, brusk, and occasionally she made scathing remarks directed at those who did not respect her moral values. When she had work to do she could find distraction difficult to cope with: one day when she had a scientific paper to finish, she dryly remarked to John and Dorothy Soule who were visiting at the time, that they were bothering her. She rarely joked, but was a good observer and could describe people and events with great humour. She was interested in and generously supportive of the research of her younger colleagues, and was great company especially over a good meal accompanied by a fine wine, particularly when discussing Palaeozoic bryozoans with them.

Françoise Bigey was a remarkable person, well-educated and highly cultured, a passionate and valuable scientist who lived an exceptional life. Latterly her activities at the Museum brought her much pleasure interacting with colleagues with whom she worked, and she enriched the IBA. Françoise Bigey's personality was one that her friends will not forget, and she will be especially missed by her friends within the bryozoological community.

*Jean-Loup d'Hondt & Patrick Wyse Jackson*

**BOOKS**

## THE BIOGEOGRAPHY OF LAND WATER BODIES. GLOBAL REVIEW.

*Vinogradov A.V.*

Devoted to biologist and philosopher Ekaterina Yu. Vinogradova.

(*see publications list for full reference*)

The book was published in January 2020 (v.1 – January, 9; v.2 – January, 13; v.3 – January, 20; v.4 – January, 28).
The land water bodies (continental water bodies) global biogeography inventory and classification are continued. The list of land water bodies consists of 11 regia, 47 subregia, 281 provinces; 459 subprovinces and 66 districts found. Author described 692 new biogeographical divisions. The first volume includes biogeographical information about land water bodies of North and West of Palearctic region. The second volume includes biogeographical information about land water bodies of East and South of Palearctic region, Ponto-Caspian brackish-water region, Baikal region. The third volume includes biogeographical information about land water bodies of Sino-Indian region, Africa, America. The fourth volume includes biogeographical information about land water bodies of Australia, Tasmania, New Guinea, New Zealand, Oceania, Antarctica. The different intermediate land water bodies biogeography is discussed. Among them underground water bodies, springs, geysers, permafrost, swamps, marches, watts, river deltas, estuaries, lagoons, water bodies of ocean islands, glaciers, icebergs, temporary water bodies, fjords. Author examines partially continental water bodies (Black Sea, Hudson Bay etc.), polytypical and monotypical provinces, watersheds, interstitial and soil hydrobiota, the land water bodies hydrobiology and problems of biogeographic diversity preserving of land water bodies. The specific hydrobionts are shown, and Bryozoa and Phylactolaemata too. There are additions to the lists of largest, deepest, highest, underground water bodies. The list of largest land water bodies is headed by the Baltic, Caspian, estuary Saint Lawrence Bay, joint delta of the Ganges and Brahmaputra rivers, Amazon delta. The list of deepest land water bodies is headed by the Black Sea (partially), Baikal, Llanquihue, Bottomless (in Uganda), Tanganyika, Vostok and fjords Scorsby, Sognefjorden, Hardangerfjorden too. The list of highest land water bodies is headed by the lake Ojos-del-Salado, Putumayo river head, Gurudongmar, Teesta, Roopkund (Skeleton Lake). The list of largest swamps is headed by the floodplain of the Amazon river, Pantanal, Sudd, Pina (Pripyat, Polesye), floodplain of the Sepik river. The list of underground water bodies is headed by the Hamza river, water bodies of Texas, water bodies of cave Lechugia, Echo river, Sac Actun river. Record permafrost depth in Russia is 1370 m (upper reaches of the Vilyui river, Yakutia). The list of deepest rivers is headed by the Congo, Yangtze, Danube, Zambezi, Orinoco; the list of largest rivers is headed by the Amazon, Yangtze, Nile, Huanghe, Mekong. The list of largest glaciers is headed by the solid glaciers of Antarctica, Greenland, ice fields of Canadian Arctic Archipelago islands, Svalbard isle, Patagonian ice plateau. An extensive bibliography is provided. The author hopes that his monograph will be useful to limnologists, geographers, hydrobiologists and specialists, who study Russian language.



About author: Anatoly V.Vinogradov – on the site of the Internet encyclopedia «Famous scientists. Scientists of Russia». [А.В.Виноградов – на сайте интернет-энциклопедии «Известные учёные. Учёные России» http://famous-scientists.ru/14366/]. In Russian.
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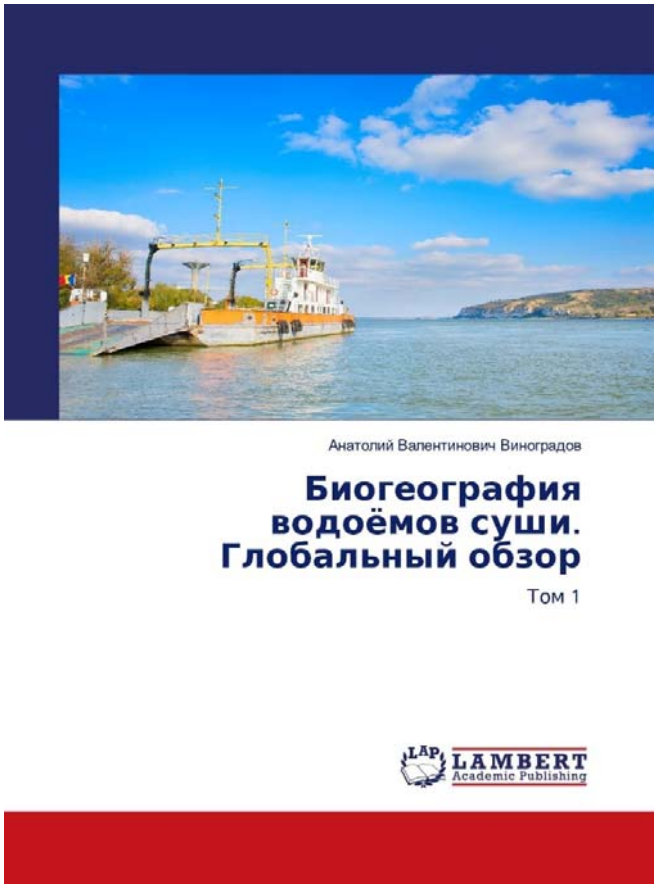
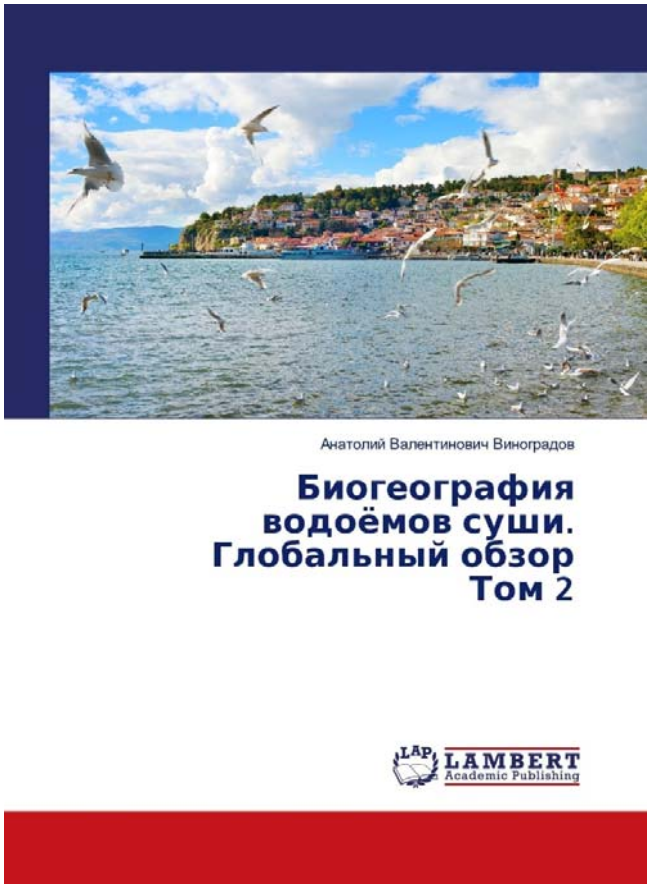
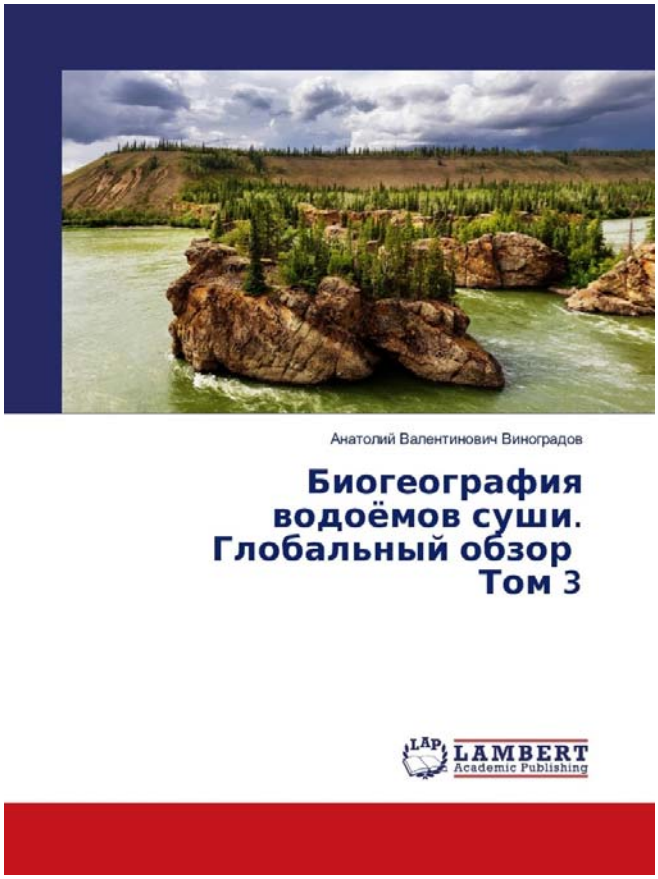


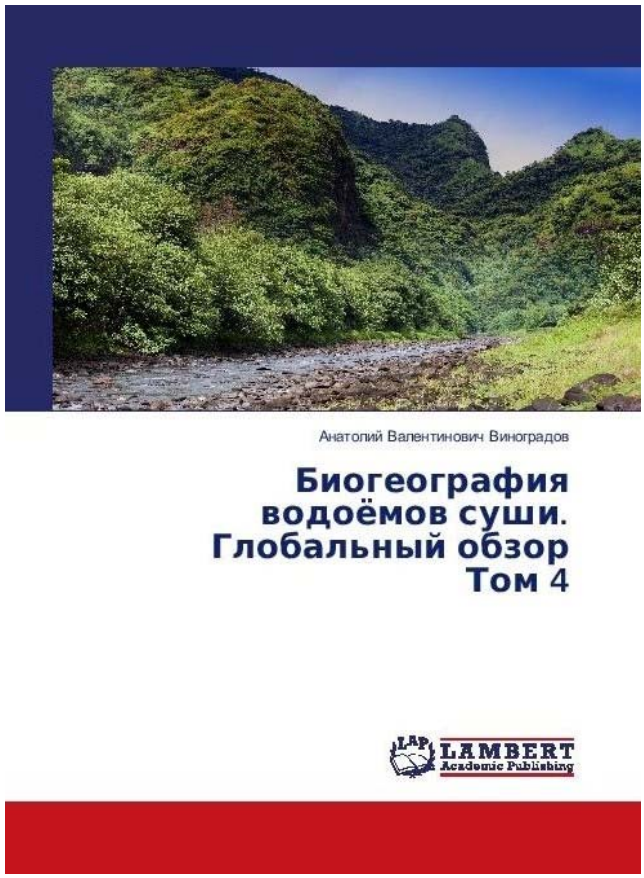

Vol 1 cover: The Danube river in Rumania.




Vol 2 cover: The lake Ochrid coast in Makedonia.




Vol 3 cover: Klondike River, Yukon River Basin in Canada.




Vol 4 cover: river on Tahiti island in Polynesia.

## FUNDING OPPORTUNITIES

Collection Manager Dr Stephen Keable at the Australian Museum wishes to advertise the following:

### OPPORTUNITY FOR SHORT-TERM FELLOWSHIP TO STUDY BRYOZOANS AT THE AUSTRALIAN MUSEUM

if you would like an all-expenses paid trip to Sydney, to identify bryozoan material in the Australian Museum collection, then please read the information about the museum's fellowships program which has recently opened for applications for visits in the 2020/21 financial year. See https://australianmuseum.net.au/get-involved/amri/awards-fellowships/. Dr Keable is happy to help with feedback on potential proposals.

## RECENT PUBLICATIONS

The following list includes bryozoan related works either published since the previous issue of the *IBA Bulletin* as sent in to the editor. As always, members are encouraged to support future compilations by continuing to send complete citations to the IBA secretary at any time. Accuracy of your citation is assured if sent in bibliographic format, if re-drafting is required by the editor accuracy is not guaranteed! Reprints will be gratefully received by the IBA archivist, Mary Spencer Jones.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