



Bulletin

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

NEWS FROM THE MEMBERSHIP

Juan Luis Suárez Andrés - After getting permits from regional and national Administration, Cova and I have been able to visit again the Emsian (Early Devonian) outcrop of Arnao, in Asturias, NW Spain. This place became a renowned locality mainly for fossil crinoids, but bryozoans are possibly the most abundant group in number of specimens, and these beds hold an excellent record of some of the least common fenestrate forms, such as the composite colonies of *Bigeyina* or the encrusting *Ernstipora*. The aim of this campaign is to collect samples of bryozoans with evidences of symbiotic organisms, either skeletonized or soft-bodied, which will eventually be described in a paper with Consuelo Sendino and Mark Wilson. There is not too much time available before the permits expire by the end of april, but we had a really good time on Sunday 5th March. The stormy weather and the tide gave us a chance and we could put hands and eyes on the bedrock for over a couple of hours, enough to get a few bryozoan colonies with unequivocal bioclaustration structures. Hopefully, it will be possible to get back to the outcrop once or twice within the next month; every time I visit this place I feel like a child at the bakery, there are so many beautiful bryozoans that I can hardly fix my eyes in just one! To be honest, samples from this outcrop usually look great to the naked eye and not so much in a thin section. The microstructure is most often recrystallized, but how would you look if you were almost 400 Ma old and had been pushed over younger rocks by a thrust?

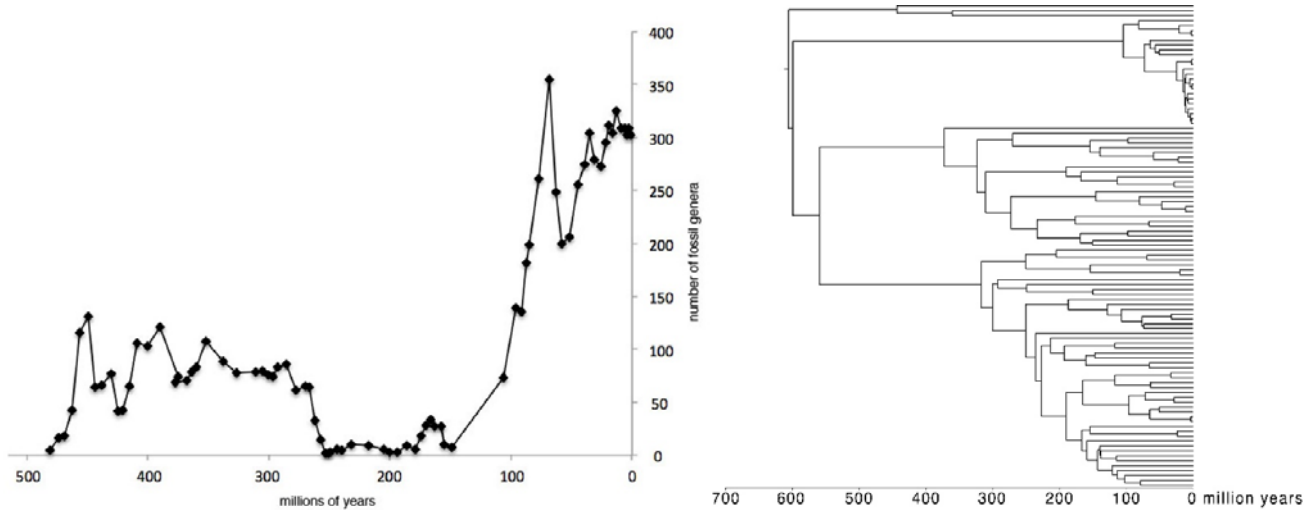


Photo 1. Trepostome bryozoan from the Aguión Formation showing abundant pores corresponding to endobiont apertures (left), with *Bigeyina ibera* (right) and other fenestrates. Photo 2. A view of the Emsian outcrop of Aguión Formation at Arnao with the low tide; the cliffs at the background correspond to the Emsian-Eifelian Moniello Formation, also rich in bryozoans.

Mohammed Naufal - My First Scientific cruise experiences. We have made the first exploration for hunting the bryozoans from the Andaman and Nicobar Island for the first time after the Shiboga expedition of 1921. Feeling the sea and interacting with the organisms, tasting the extra cold deep seawater still unforgettable experiences. After covering 2049 NM through Arabian Sea, Andaman Sea and Bengal Sea in 20 days, we collected a plenty of bryozoans including both erect and encrusting forms by dredging and grabbing. Now the time is for a calm sitting to identify the species and new findings. We hope that the identification will give at least a few new findings from the isolated archipelago of Andaman. FORV SAGAR SAMPADA was on her 355th voyage. Heartily thanks to Pondicherry University, CMLRE, and Ministry of Earth Sciences for the facilitations. Sir Dennis Gordon, Dr. Piotr Kuklinski, Prof. Abigail. M. Smith Dr. Kamil Zagoresk for valuable suggestions and encouragement. We welcomed "2017" from The Bay of Bengal. That days in the Monument left me awe-inspired and entertained, truly driving home the reality of Earth's deep-sea environment being less explored than the surface of our moon. If anybody of you are coming to Andaman Islands for holidays please let me know and I am happy to interact and help you. naufalpj@gmail.com



Andrea Waeschenbach and her co-investigators **Paul Taylor**, **Lee Hsiang Liow** and **Natalie Cooper** and named collaborators **Dennis Gordon**, **Scott Lidgard**, **Emanuela di Martino**, **Björn Berning**, **Andrey Ostrovsky**, **Aaron O’Dea**, **Mary Spencer Jones**, **Joanne Porter**, **Robyn Cumming**, **Abigail Smith**, **Leandro Vieira**, **Karin Hoch Fehlaue-Ale**, **Wayne Florence**, **Masato Hirose** and **Piotr Kuklinski** have been awarded £350k from the Leverhulme Trust to study cheilostome diversity dynamics since their origin ~160 million years ago. Typically, changes in ancient biodiversity have either been inferred from the fossil record, or from the shapes and branching patterns of time-calibrated molecular trees. However, the fossil record provides only a partial picture of past diversity, and there are likewise difficulties in estimating past diversities, especially extinction rates, from molecular trees.



We will make use of all the available evidence by integrating fossil and molecular data. As such there are two 3-year postdoctoral positions, which will be taken up by **Silviu Martha** and **Helen Jenkins**. Specifically, we will examine which physical and/or biological factors correlate with these variations.

A key product of this project will be a family-level time-calibrated phylogeny. This means that we will need to get our hands on **fresh or ethanol-preserved material**. We will be conducting fieldwork in Brazil (hosted by Leandro and Karin), South Africa (hosted by Wayne), Australia (hosted by Robyn and Karen Gowlett-Holmes in Tasmania) and Panama (hosted by Aaron), but in addition we would like to call upon the IBA community to **help us collect material**. We would like to incorporate species from each of the extant families (see list below; we are particularly desperate for taxa in red!). The construction of a family-level phylogenetic framework will allow us to assess the monophyly of families, especially of those known to be taxonomic dumping grounds. As such, we expect there to be numerous molecular systematic spin-off papers, so plenty of opportunities for co-authorship, especially if there is a pet-group you are particularly interested in and material can be sourced easily. Any material should be preserved in >95% ethanol. Unfortunately, formalin wreaks havoc with DNA and renders material near useless. IMS (industrial methylated spirit) is also bad news, but we can try IMS-preserved material if no other material is available.

As you may have read in the previous bulletin, Lee Hsiang was recently awarded a European Research Council Consolidator Grant to work on bryozoans. Tissue samples will therefore be shared amongst us and we will work towards coordinating and complementing our sequencing efforts to build a fabulous phylogeny. If you wish to send samples, please e-mail me (a.waeschenbach@nhm.ac.uk) or Lee Hsiang (l.h.liow@ibv.uio.no). We look forward to hearing from many of you ☺. Very exciting times ahead!!!

Electridae: Pyripora, Arbocuspis
 Leiosalpingidae: Astoleiosalpinx, Leiosalpinx
 Belluloporidae: Bellulopora
 Mourellinidae: Mourellina
 Calloporidae: Any! Need sampling extensively
 Antroporidae: Any!
 Chaperiidae: Any except Chaperiopsis
 Doryporellidae: Doryporella, Doryporellina
 Hippaliosinidae: Hippaliosina

Hiantoporidae: Hiantopora
 Quadricellariidae: Any!
 Bryopastoridae: Any!
 Farciminariidae: Any!
 Tentridae: Heterooecium
 Heliodomidae: Heliodoma, Setosellina
 Cupuladriidae: Any!
 Flustridae: Any, except Flustra
 Bugulidea: Any except Bugula

Epistomiidae: Epistoma, Synnotum
 Euoplozoidae: Euoplozoum
 Jubellidae: Jubella
 Microporidae: Any!
 Monoporellidae: Monoporella
 Macroporidae: Macropora
 Calescharidae: Any!
 Setosellidae: Setosella
 Lunulariidae: Lunularia
 Otionellidae: Any!
 Selenariidae: Selenaria, Discovibracella
 Onychocellidae: Any!
 Aspidostomatidae: Any!
 Steginoporellidae: Any, except Steginoporella
 Thalamoporellidae: Any, except Thalamoporella
 Chlidoniidae: Chlidonia
 Poricellariidae: Poricellaria
 Alysidiidae: Alysidium, Catenicula, Paracatenicula
 Cellariidae: Any, except Cellaria
 Membranicellariidae: Membranicellaria, Cookinella
 Bicorniferidae: Voorthuyseniella
 Cribriliinidae: Any! Need sampling extensively.
 Pollicipora: Pollicipora
 Bifaxariidae: Any!
 Mixtopeltidae: Mixtopelta
 Catenicellidae: Any, except Catenicella.
 Eurystomellidae: Any!
 Savignyellidae: Halysisis, Savignyella
 Petalostegidae: Chelidozoum, Petalostegus
 Hippothoidae: Any, except Celleporella
 Chorizoporidae: Chorizopora, Costulostega
 Trypostegidae: Any!
 Pasytheidae: Any!
 Arachnopusiidae: Any, except Arachnopusia
 Exechonellidae: Anexechona, Exechonella, Stephanopora,
 Xynexecha
 Adenoidae: Any
 Adeonellidae: Any
 Inversiulidae: Inversiula
 Pseudolepraliidae: Pseudolepralia
 Lepraliellidae: Any!
 Dhondtiscidae: Dhondtiscus
 Brycryptellidae: Any
 Romancheinidae: Any, except Escharoides
 Umbonulidae: Any, except Umbonula
 Tessaradomidae: Any!
 Hincksiporidae: Hincksipora
 Sclerodomidae: Any!
 Metrarabdotosidae: Any!
 Chlidoniopsidae: Chlidoniopsis

Smittinidae: Any!
 Bitectiporidae: Any, except Pentapora
 Watersiporidae: Any, except Watersipora
 Schizoporellidae: Any!
 Stomachetosellidae: Any!
 Tetraplariidae: Tetraplaria
 Porinidae: Any!
 Myriaporidae: Any!
 Hippopodidae: Any!
 Pacificincolidae: Pacificincola, Primavelans
 Hippaliosinidae: Hippaliosina
 Gigantoporidae: Any!
 Cheiloporinidae: Any!
 Actisecidae: Actisecos
 Teuchoporidae: Lagenicella, Teuchopora, Coleopora
 Echinovadomidae: Echinovadoma
 Phoceanidae: Phoceana, Sertulipora
 Mawatariidae: Mawatarus
 Vicidae: Cyclostomella, Vix
 Robertsonidridae: Robertsonidra
 Microporellidae: Any!
 Calwelliidae: Any!
 Petraliidae: Petralia
 Petraliellidae: Any!
 Cyclicoporidae: Cyclicopora
 Lacernidae: Any!
 Escharinidae: Any!
 Acoraniidae: Acorania
 Buffonellodidae: Any!
 Eminooeciidae: Eminooecia, Isoschizoporella, Macrocamera
 Urceoliporidae: Urceolipora, Reciprocus
 Prostomariidae: Prostomaria
 Didymosellidae: Didymosella, Tubiporella
 Euthyrisellidae: Euthyrisella, Pleurotoichus,
 Pseudoplatyglana, Tropidozoum
 Neoeuthyridae: Neoeuthyris
 Siphonicytaridae: Siphonicytara
 Mamilloporidae: Mamillopora, Anoterpora
 Cleidochasmatidae: Any!
 Ascosiidae: Any!
 Colatooeciidae: Cigclisula, Colatooecia, Trematooecia
 Celleporidae: Any!
 Torquatellidae: Torquatella
 Hippopodrididae: Any!
 Phidoloporidae: Any! Need sampling extensively.
 Batoporidae: Batopora, Lacrimula
 Conescharellinidae: Any!
 Lekythoporidae: Any!
 Orbituliporidae: Any

Incertae sedis: Austroflustra, Klugeflustra, Neoflustra, Acanthodesiomorpha, Brettia, Julianca, Neoeuthyris, Ogivalia,
 Parastichopora, Robertsonidra, Stomacrustula, Pseudolunularia, Rhabdozoum

Heather Grant is undertaking a Master's project as part of the MRes in Biosystematics at the Natural History Museum and Imperial College London under the guidance of Andrea Waeschenbach and Andrey Ostrovsky. Cheilostome species that perform parental care have been targeted for sequencing and will be added to the wider cheilostome phylogeny in order to investigate the frequency of brood incubation evolution in this group. Heather's sequencing strategy is that of genome-skimming, which is hoped to produce data for complete mitochondrial genomes and the nuclear ribosomal operon. She's hoping to obtain these data for *Aetea* sp., *Thalamoporella* spp., *Biflustra* sp. (collected by Andrey in the Seychelles), *Eucratea loricata* (collected by Olga Kotenko in the White Sea), *Leiosalpinx australis*, '*Membranipora*' *pura* (collected by Dennis Gordon in New Zealand), *Brettiopsis triplex* (collected by the British Antarctic Survey in 1986 at Signy Island, Antarctica; held at the NHM spirit collection), and *Scruparia chelata* (collected by Heather in Wales). Heather is aiming to present her results at the Vienna Larwood Meeting in May.

Heather looking for *Scruparia chelata* in Tenby, Wales.



FUNDING OPPORTUNITIES

The new Helmholtz Institute for Functional Marine Biodiversity at the University Oldenburg (to be founded 2017) offers a number of position in the realm marine biodiversity (see PDFs emailed to IBA members 2 April 2017)). Please feel free to forward this information to anybody who may be interested.

Best regards,
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thomas.brey@hifmb.de



MEETING REPORT

SEVENTH AUSTRALARWOOD MEETING HELD IN WELLINGTON

By Dennis P. Gordon, NIWA

On Thursday 9 February, New Zealand's capital city, Wellington, was the location for the 2017 Australarwood meeting, 11 years after the first such meeting was held there in 2006. The venue was again the National Institute of Water & Atmospheric Research (NIWA).



Meeting attendees – back row, Alan Beu, Paul Taylor, Ken Ryan, Kaedon Leonard, Christine Davis, Chad Hewitt, Michèle Prinsep, Seabourne Rust, Catherine Reid, Phil Bock. Front row – Dennis Gordon, Lee Hsiang Liow, Rolf Schmidt, Carolann Schack, Abby Smith, Lena Thrane, Eckart Håkansson, Renae McLachlan.

Fifteen of the 22 attendees (from five countries) gave presentations.

Kaedon Leonard (University of Waikato, New Zealand): Epibiotic pressure contributes to bryozoan invader success

Christine Davis (University of Otago, New Zealand): Life-cycle changes in *Bugulina flabellata*, a southern-hemisphere adventive bryozoan

Renae McLachlan (Victoria University of Wellington, New Zealand): Effects of sound frequencies on the settlement of *Watersipora* larvae

Carolann Schack (Victoria University of Wellington & NIWA, New Zealand): Trait-environment relationships of cheilostome bryozoans

Lee Hsiang Liow (University of Oslo, Norway): Size matters in competitive overgrowth

Michèle Prinsep (University of Waikato, New Zealand): Chemical ecology of New Zealand marine bryozoans—current knowledge and future directions

Abby Smith (University of Otago, New Zealand): Growth and calcification in bryozoans

Seabourne Rust, Dennis Gordon et al. (Moirai Studio/Gallery & NIWA, New Zealand): A bryozoan-rich assemblage from the Early Miocene of Hokianga, Northland, New Zealand

Paul Taylor et al. (Natural History Museum, London, UK): Turnover time: bryozoans from the Campanian of southwest France

Catherine Reid (University of Canterbury, New Zealand): Review of New Zealand Palaeozoic bryozoan faunas—implications for palaeogeographic reconstructions

Amy Joy Hess (Eastern Washington University, USA): Bryozoan taxa from the Toroweap Formation of southern Nevada

Eckart Håkansson *et al.* (University of Western Australia): The history of a Plio–Pleistocene marine cave

Rolf Schmidt (Museum Victoria, Australia): Encrusting bryozoans—lost in the collections

Phil Bock (Mt Waverley, Victoria, Australia): *Sphaeropora*—yet another little-known diverse group

Katerina Achilleos (University of Otago, New Zealand): Use of bryozoans as a tool in marine archaeology (Kyrenia wreck, Cyprus)

The meeting was followed by a group dinner at a harbourside restaurant, also attended by some accompanying persons.

The next day, 21 bryozoologists and accompanying persons participated in a field trip to the southern Wairarapa region of North Island, beyond the ranges east of Wellington. Stops included two Lord of the Rings film locations, one at Kaitoke (where Rivendell scenes were shot), and the Putangirua Pinnacles (en route to the Paths of the Dead). At Cape Palliser, the southeastern-most point of North Island, numerous fur seals were encountered lazing on the rocks. Lunch was at a nearby location (Kupe’s Sail) where bryozoans were collected from Late Miocene limestone. At the end of a long but pleasant day, everyone enjoyed unwinding outdoors in warm sun on the patio of the Martinborough Hotel, in the heart of the wine district, before retiring to the hotel’s elegant Wellington Room for dinner, followed by the trip back to Wellington.



Top left – bryozoologists at Rivendell. *Top right* – Late Miocene bryozoans at Kupe’s Sail (photo Paul Taylor). *Bottom* – end of tour unwinding at the Martinborough Hotel

ARTICLES

CONTINENTAL DRIFT: NORTHERN BRYOZOOLOGISTS IN ZEALANDIA

Paul D. Taylor & Lee-Hsiang Liow

Recently New Zealand was recognized as a landmass on a plate of its own called Zealandia. In early 2017, several of us from Europe drifted, well, jetted in Boeings and Airbuses, to Zealandia for the austral summer and, of course, to study the bountiful bryozoans, fossil and Recent, of this new continent.

First to pitch up in Zealandia was Lee Hsiang Liow, on a three-month sabbatical leave from the University of Oslo. She was followed by Paul Taylor who spent five weeks in New Zealand, arriving in time for the Australarwood Symposium and remaining in Wellington to work with the evergreen Dennis Gordon on the taxonomy of Recent cyclostomes in the NIWA collection. Lee Hsiang and Paul were joined at the end of February by Emanuela Di Martino (NHMUK) and Kjetil Voje along with two bryozoan molecular phylogeny Masters students from Oslo, Emily Enevoldsen and Jeroen Boeve. The six of us northern immigrants, together with trusty guide Seabourne Rust, GNS molluscan specialist Alan Beu and Dennis's doctoral student Carolann Schack, formed the crew of the second geological field season (WABO2) in the Wanganui (or Whanganui) Basin, continuing our work which had begun in 2014 with WABO1. For Emily, Jeroen and Carolann, this was their first experience of a palaeontological field expedition but all three proved to be excellent at finding fossils, packing and recording.



The WABO2 field crew (minus the photographer, Paul). From left to right: Alan, Kjetil, Emanuela, Carolann, Seabourne, Emily and Jeroen.



Nukumaru Bay, one of several fossil bryozoan sites in the Whanganui Basin with breathtaking coastal scenery.

According to Brad Pillans (2017, p. 141), the “Whanganui Basin is a unique global archive—nowhere else in the world is there yet documented a shallow marine basinal sequence, exposed on land, which spans the entire Quaternary”. The 2 km-thick sediments are magnificently exposed in the coastal cliffs fringing Cook Strait between the river city of Whanganui in the south-east and Hawera in the north-west. Our research here focuses mainly on competitive overgrowth interactions between the encrusting bryozoans that are common in the numerous molluscan shell beds distributed through the sequence. We are interested in knowing whether there have been changes in winners and losers through geological time (see Liow *et al.* 2016), in identifying traits correlated with competitive success and whether success impacts abundance and longevity. Given the high diversity of species present, large sample sizes are required for analyses to be statistically robust when it comes down to interactions between particular pairs of species. Some shell beds not visited in 2014 were sampled for the first time, and a large quantity of additional material was collected from previously sampled horizons. Our 2014 collections were largely restricted to cheilostome–cheilostome interactions on bivalve shells, but the new collections also included cheilostome–cyclostome interactions, as well as bryozoans encrusting other substrates (e.g. gastropods, barnacles and lithic clasts). We were also on the hunt for colonies of the ‘big one’ – *Steginoporella* – for an evolutionary study being undertaken by Kjetil. Fortunately, we were blessed with fine weather, albeit very windy at times, for our ten days in the field, and the trip was unanimously deemed a great success, and not only because of the wonderful coffee, cakes and ice-creams consumed at the strawberry farm on the coastal road.



Left - Shell of *Ostrea chilensis* from the Nukumaru Limestone encrusted by numerous interacting cheilostome and cyclostome bryozoans, as well as the odd barnacle. Right - Cliff of cross-bedded Early Pleistocene Nukumaru Limestone, western end of Nukumaru Beach, New Zealand.

References

- Liow, L. H., Di Martino, E., Voje, K. L., Rust, S. & Taylor, P. D. 2016. Interspecific interactions through 2 million years: are competitive outcomes predictable? *Proceedings of the Royal Society, Series B*, 283: 20160981
- Pillans, B. 2017. Quaternary stratigraphy of Whanganui Basin—a globally significant archive. Pp. 141–170 in J. Shulmeister (ed.). *Landscape and Quaternary environmental change in New Zealand*. Atlantic Press.



A LETTER FROM ANDREW OSTROVSKY TO COLLEAGUES

There are just a few actively working bryozoan taxonomists dealing with cheilostomes left in our community, and I ask them to pay attention to my request.

During last 5 years I reviewed about 20 taxonomic papers on cheilostomes written by various authors from the IBA. The quality of the descriptions is normally very good, except of the brood chambers.

I stressed this problem during my talks in Dublin, Boone and Catania with a little response from the community, unfortunately.

I spent a lot of efforts to make a standard terminology and explain to colleagues how the cheilostome brood chambers are constructed in my presentations, papers and a book, but few people follow my guidelines while others continue to rely on their own preferences and mistaken, but traditional, descriptive terms. It is sad.

When describing a cheilostome, please, consider at least the following most important aspects:

- use the term OVICELL thinking about the entire structure, consisting of the ooecium, brood cavity and oocial vesicle/plug. Ovicells could be hyperstomial (=prominent), subimmersed, immersed, endozoidal and endotoichal depending on the position and immersion of the brood cavity. Ovicells could be acleithral, cleithral, semicleithral and non-cleithral depending on its closure.
- OOECIUM is just a two-walled protective 'hood' that could be vestigial or not, partially or entirely calcified, have different origins (formed from either distal or maternal zooid) and external relief, being either kenozooidal or not, etc. Ooecia cannot be hyperstomial and acleithral, immersed or endozoidal. These terms should be applied to the ovicells.
- Please, don't use "recumbent" and "dependent-independent" for both ovicells and ooecia.

Here is a piece from my 2013 book which electron version I could send to everyone (p. 125):

The terms "ovicell" and "ooecium" (reflecting an early supposition that the chamber contains an ovary) were introduced by Busk (1852) and Hincks (1873), and have been effectively regarded as synonymous. However, as soon as anatomical descriptions appeared (Vigelius 1884a,b, 1886; Calvet 1900) it became clear that such synonymy is misleading. One problem is that the terms "ovicell" and "ooecium" are generally applied to both the externally visible part of the brood chamber and the entire structure. The most obvious example is the often-used phrase "vestigial ovicell," which is terminologically nonsensical, since "vestigial" can apply only to the protective fold (ooecium), whereas the actual brood cavity is always capacious. An ovicell cannot be vestigial. In another example, an immersed ovicell is typified by a brood cavity that is situated below the colony surface, whereas its ooecium is an external structure and cannot be immersed. The same is true of endozoidal ovicells possessing an internal cavity for embryo incubation and externally projecting ooecia.

As to the fossil species, we should describe them following the same lines especially if we know the ovicell structure in the Recent relatives.

To conclude. Since cheilostome brood structures are so diverse, it is sometimes not easy to describe them precisely. There are very detailed schemes for most of the known types in the Chapter 2 of my book, but if you have doubts, I ask you to send me your MS or their pieces with photos just for checking descriptions of the brood chambers. This should help to avoid confusions. I am not going to touch anything else!

Cheers,
Andrew

GENOME OF *CRISTATELLA MUCEDO*: THE FIRST TOUCH.

Victor Starunov, Arina Maltseva, Andrew Ostrovsky

The phylactolaemate *Cristatella mucedo* is a common bryozoan in Europe and North America, possessing colonies that are able to move on the substrate and demonstrate negative phototaxis. Both these aspects reflect the presence of effective whole-colony integrating mechanisms. The colonies are suitable for laboratory maintenance that makes *Cristatella* a perspective and informative model to study different aspects of bryozoan biology and evolution, including mechanisms of colonial growth and integration within a colony.

Clearly bryozoans are still understudied at the molecular level. At the moment, research on the mitochondrial genomes of several marine bryozoan species were performed (Waeschenbach et al., 2006; Jang & Hwang, 2008; Sun et al, 2009; Shen et al. 2012). Larval transcriptome of *Bugula neretina* was also reported (Wang et al., 2010; Wong et al., 2014). No whole genome data are available up to date for any bryozoan species, however.

Last year we started the genome project of *C. mucedo*. The expected genome size is about 0,49-0,83 Gb (Potter, 1979). Paired end library construction, sequencing and primary assembly was performed by Genotek company, Russia. The sequencing was done using Illumina HiSeq2500 and Illumina MiSeq instruments. The error correction was performed by BFC tool and the de novo assembly was done using ABySS assembler.

Assembly quality parameters (only contigs with a length of 500 nucleotides and more are considered):

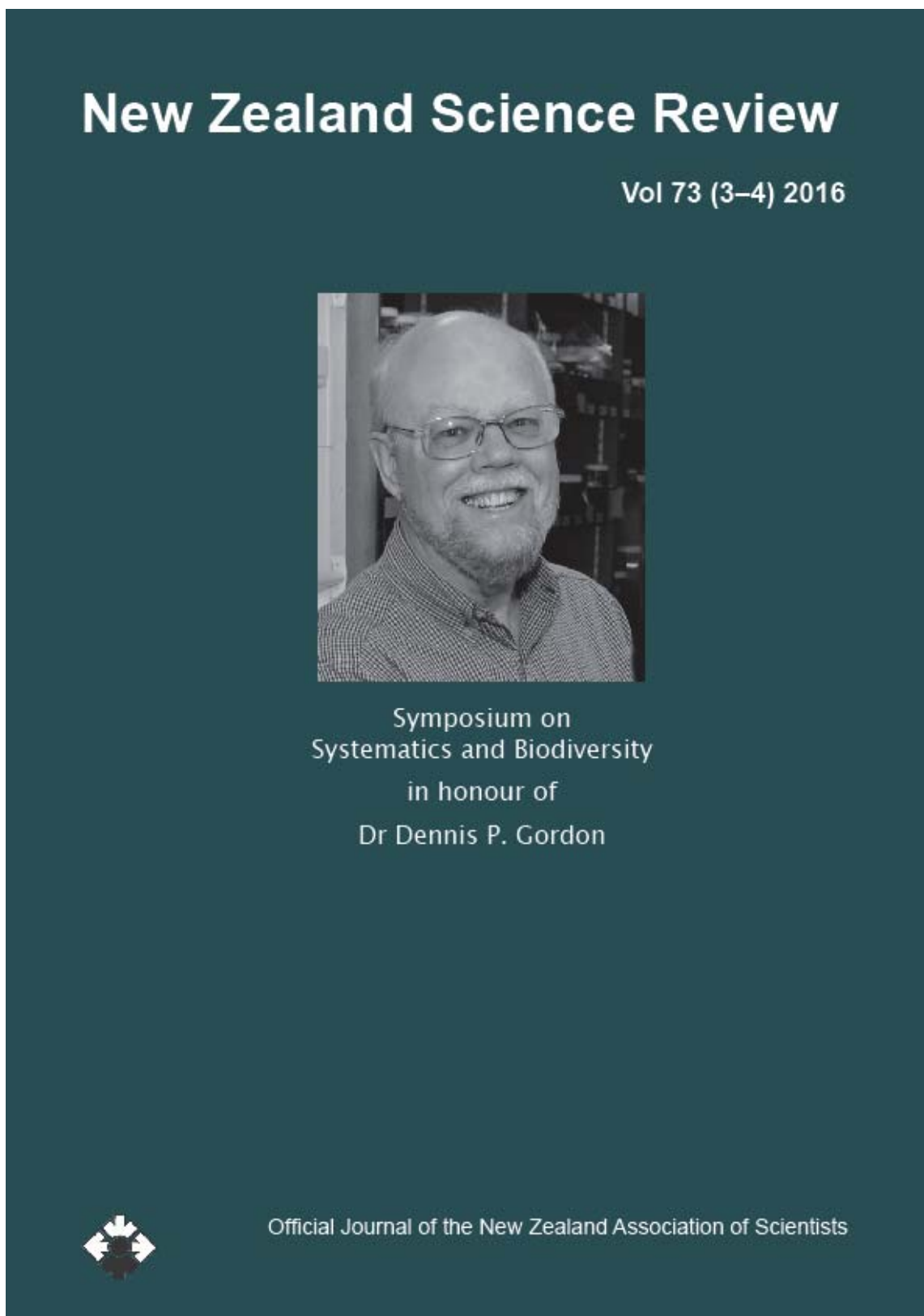
- Number of contigs – 165925
- Assembly size – 504 Mb
- N80 = 2164
- N50 = 4633
- N20 = 8742
- The longest contig – 44958 bp

The annotation was done using MAKER pipeline.

As a next step the Oxford Nanopore MinIon instrument will be applied to obtain longer reads that could significantly improve the assembly quality.

The *C. mucedo* genome is an open project, and colleagues are welcome to contact us.

- Potter, R. (1979) Bryozoan karyotypes and genome sizes. In: Advances in Bryozoology (eds G.P. Larwood & M.B. Abbott), pp. 11–32. Academic Press, London.
- Jang K.H., Hwang U.W. (2009) Complete mitochondrial genome of *Bugula neretina* (Bryozoa, Gymnolaemata, Cheilostomata): phylogenetic position of Bryozoa and phylogeny of lophophorates within the Lophotrochozoa. *Bmc Genomics*, 10(1): 167.
- Shen X., Tian M., Meng X., Liu H., Cheng H., Zhu C., Zhao F. (2012) Complete mitochondrial genome of *Membranipora grandicella* (Bryozoa: Cheilostomatida) determined with next-generation sequencing: The first representative of the suborder Malacostegina. *Comparative Biochemistry and Physiology Part D: Genomics and Proteomics*, 7(3): 248-253.
- Sun M.A., Wu Z., Shen X., Ren J., Liu X., Liu H., Liu B. (2009) The complete mitochondrial genome of *Watersipora subtorquata* (Bryozoa, Gymnolaemata, Ctenostomata) with phylogenetic consideration of Bryozoa. *Gene*, 439(1): 17-24.
- Waeschenbach A., Telford M.J., Porter J.S., Littlewood D.T.J. (2006) The complete mitochondrial genome of *Flustrellidra hispida* and the phylogenetic position of Bryozoa among the Metazoa. *Molecular phylogenetics and evolution*, 40(1): 195-207.
- Wang H., Zhang H., Wong Y. H., Voolstra C., Ravasi T., Bajic V., Qian P.Y. (2010) Rapid transcriptome and proteome profiling of a non-model marine invertebrate, *Bugula neretina*. *Proteomics*, 10(16): 2972-2981.
- Wong Y. H., Ryu T., Seridi L., Ghosheh Y., Bougouffa S., Qian P.Y., Ravasi T. (2014) Transcriptome analysis elucidates key developmental components of bryozoan lophophore development. *Scientific reports*, 4: 6534.



The January issue of the New Zealand Science Review featured publications from the one-day symposium in May 2016 to mark Dennis Gordon's retirement previous October and was used as a springboard to highlight the importance of taxonomy and the plight of taxonomists in this part of the world, hence the tenor of the articles.

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Journal of Sedimentary Research



An International Journal of SEPM
(Society for Sedimentary Geology)

Cover Photo: "Cyclostome bryozoan *Hornera robusta* is a dominant component of shelf carbonate sediments in New Zealand (photo by Abigail M. Smith)..

Pretreatment For Removal of Organic Material Is Not Necessary For X-Ray-Diffraction Determination of Mineralogy In Temperate Skeletal Carbonate

Abigail M. Smith, Marcus M. Key Jr., Zoe E. Henderson, V. Christine Davis, and David J. Winter

JOURNAL OF SEDIMENTARY RESEARCH 2016; 86:1425-1433 doi:10.2110/jsr.2016.86

<http://jsedres.sepmonline.org/content/86/12/1425.abstract>

MEETINGS AND CONFERENCES

LARWOOD MEETING 2017

Meeting details - Thomas Schwaha will host the next Larwood meeting in Vienna from 25th of May till the 28th.

Hope to see many of you here in Vienna next year!

Cheers

Thomas

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RECENT PUBLICATIONS

The following list includes 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.

Di Martino, E., Taylor, P. D. & Portell, R. W. 2017. Bryozoans from the Lower Miocene Chipola Formation, Calhoun County, Florida, USA. *Bulletin of the Florida Museum of Natural History* 53(4): 97–200.

Di Martino, E., Taylor, P. D., Cotton, L. J. & Pearson, P. N. 2017. First bryozoan fauna from the Eocene–Oligocene transition in Tanzania. *Journal of Systematic Palaeontology*, DOI: 10.1080/14772019.2017.1284163.

Di Martino, E., Greene, S. & Taylor, P. D. 2017. *Discoradius*, a new name for the genus *Heteractis* Gabb & Horn, 1862 (Cheilostomata, Bryozoa), junior homonym of *Heteractis* Milne-Edwards & Haime, 1851 (Cnidaria, Actiniaria). *Journal of Systematic Palaeontology*, DOI: 10.1080/14772019.2017.1300197.

Figuerola B, Barnes DK, Brickle P, Brewin PE (2017) Bryozoan diversity around the Falkland and South Georgia Islands: Overcoming Antarctic barriers. *Mar Environ Res* 126:81-94

Gontar V.I. 2016. FIRST FINDING OF FRESHWATER BRYOZOA *PLUMATELLA GEIMERMASSARDI* WOOD & OKAMURA, 2004 (PHYLACTOLAEMATA) IN THE KOPORA BAY OF THE ESTERN PART OF THE GULF OF FINLAND. *Regional ecology*, № 1 (43), p. 57-62 [In Russian]

Gontar V.I. 2016. BRYOZOA OF THE BLACK SEA. *BULLETIN OF SCIENCE AND PRACTICE*. №10 (October), p. 29-34. <http://www.bulletennauki.com> [In Russian]

Gontar V.I. 2016. Bottom fauna and ecology of Bryozoa of the Laptev Sea. In: *Vlyaniye nauki na innovation razvitie [Influence of science in innovation development]*. International scientific and practice conference. Part 2. *Nits Aeterna*, p. 12-20 [In Russian]

Gontar V.I. 2016. Bryozoa. Key of zooplanktona and zoobenthos of fresh water of the European part of Russia. T. 2. *Zoobenthos*. Eds: V.R.Alekseev, S.Ya.Tsalolikhin. Moscow-Saint Petersburg. *Tovarishchestvo nauchnykh izdaniy KMK*. C.153-163 [In Russian]

Gordon, D. P. & Taylor, P. D. 2017. Resolving the status of *Pyrporoides* and *Daisyella* (Bryozoa: Cheilostomata), with the systematics of some additional taxa of Calloporoidea having an ooeial heterozooid. *Zootaxa*, 4242: 201–232.

Gordon, D.P and Costello, M.J. 2016. Bryozoa—not a minor phylum. *New Zealand Science Review* 73 (3–4) p63-66.

HONDT, Jean-Loup d' (2016).- Sur quelques Bryozoaires Cheilostomes de Madagascar (Bryozoa). *Bull. Soc. Linn. Bordeaux*, NS 44 (4) : 337-348.

Lombardi, C., Taylor, P. D., Cocito, S., Bertolini, C. & Calosi, P. 2017. Low pH conditions impair module capacity to regenerate in a calcified colonial invertebrate, the bryozoan *Cryptosula pallasiana*. *Marine Environmental Research*, <http://dx.doi.org/10.1016/j.marenvres.2017.02.002>.

Jenkins HL, Waeschenbach A, Okamura B, Hughes RN, Bishop JDD (2017) Phylogenetically Widespread Polyembryony in Cyclostome Bryozoans and the Protracted Asynchronous Release of Clonal Brood-Mates. *PLoS ONE* 12(1): e0170010. doi:10.1371/journal.pone.0170010

- Muricy, G., Domingos, C, Tavora, V.A, Ramalho, L.V., Pisera, A., and Taylor, A. 2016. Hexactinellid sponges reported from shallow waters in the Oligo-Miocene Pirabas Formation (N Brazil) are in fact cheilostome bryozoans. *Journal of South American Earth Sciences*, 72: 387-397.
- Rowden, Ashley A 2016. The study of taxonomy and systematics enhances ecological and conservation science. *New Zealand Science Review* 73 (3–4) p72-78
- Smith, AM, Bock P, Batson P, 2016. The contribution of Dennis P. Gordon to the understanding of New Zealand Bryozoa. *New Zealand Science Review* 73 (3–4) p67-71
- Taylor, P. D. & Martha, S. 2017. Cenomanian cheilostome bryozoans from Devon, England. *Annales de Paléontologie*, 103: 19–31.
- Taylor, P. D. & Jenkins, H. L. 2017. Evolution of larval size in cyclostome bryozoans. *Historical Biology*, DOI: 10.1080/08912963.2017.1301447.

