

# 10<sup>th</sup> World Sponge Conference

NUI Galway

25-30 June 2017



<u>Báslavi Córdor Lujá</u> <sup>1</sup> , Pedro Leocorny <sup>1</sup> , Fernanda Azevedo <sup>1</sup> , André Padua <sup>1</sup> , Eduardo Hajdu <sup>2</sup> , Philippe Willenz <sup>3,4</sup> , Yuri Hooker <sup>5</sup> & Michelle Klautau <sup>1</sup> .....	143	<u>Nathan J. Kenny</u> <sup>1</sup> , Ana Riesgo <sup>1</sup> , Helena Wiklund <sup>1</sup> , Gordon L.J. Paterson <sup>1</sup> , Thomas G. Dahlgren <sup>2,3</sup> , Adrian G. Glover <sup>1</sup> , Sergio Taboada <sup>1</sup> .....	155
Sponge bottoms off the Amazon River mouth revisited		Integrative Systematics of Tropical Western Atlantic <i>Mycale</i> of the “ <i>immitis</i> -group”	
<u>Fernando Moraes</u> <sup>1</sup> , Camille Leal <sup>2,3</sup> , Sula Salani <sup>2</sup> , Maira Ventura <sup>1</sup> & Eduardo Hajdu <sup>2</sup> .....	144	<u>Dora Leite</u> <sup>1</sup> , Thiago S. de Paula <sup>2</sup> ; Gisele Lôbo-Hajdu <sup>2</sup> ; Eduardo Hajdu <sup>1</sup> .....	155
Diversity of Porifera in the Aviles Canyons System: COCACE project		Taiwan deep-water sponge collection at the National Museum of Natural Science at Taichung (Taiwan)	
Pablo Heres <sup>1,2</sup> , <u>Javier Cristobo</u> <sup>3</sup> , Nuria Anadón <sup>4</sup> & Pilar Ríos <sup>3</sup> .....	145	Swee Cheng Lim .....	156
Calcareous sponges of the Western Indian Ocean and the Red Sea		Evolution of haplosclerid sponges: insights from kinetid structures	
Rob W.M. van Soest & <u>Nicole J. de Voogd</u> .....	145	<u>Maria Belinda Longakit</u> <sup>1,2</sup> , Christine Morrow <sup>1</sup> & Grace P. McCormack <sup>1</sup> .....	156
The deep water sponge fauna of Guadeloupe		Spicular Analysis for Reconstructions of Sponge Communities in Modern Coral Reefs	
<u>Nicole J. de Voogd</u> <sup>1</sup> , Gydo Geijer <sup>1</sup> & Cécile Debitus <sup>2</sup> .....	146	Magdalena Łukowiak .....	157
The Sponge Collection of the Yale Peabody Museum of Natural History		Siliceous Sponges from the Upper Eocene of Eastern Central Ukraine	
Daniel Drew, Eric Lazo-Wasem, Janie Wulff. ....	146	Magdalena Łukowiak <sup>1</sup> , Tetiana Stefanska <sup>2</sup> & Andrzej Pisera <sup>1</sup> .....	157
Taxonomic Revision of the Family Heteropiidae (Porifera, Calcarea) in Norwegian Waters		Varied environments drive rapid divergence in sponge ( <i>Suberites diversicolor</i> ) populations	
<u>Hilde Strand Dybevik</u> , Adriana Alvizu & Hans Tore Rapp .....	146	<u>Diede Maas</u> <sup>1</sup> , Ke Bi <sup>2,3</sup> , Stefan Prost <sup>4,5</sup> , Maria Meijer <sup>1</sup> , Ludi P. Aji <sup>6</sup> , <u>Gandi Purba</u> <sup>7</sup> , Rosemary Gillespie <sup>8</sup> & Leontine Becking <sup>1,8,9</sup> .....	158
Three new <i>Halisarca</i> -like sponges (Porifera, Verongimorpha) from tropical seas		The freshwater sponge fauna of Madagascar: a first assessment	
<u>Alexander Ereskovsky</u> <sup>1,2</sup> , Pierre Chevaldonné <sup>1</sup> , Maude Dubois <sup>1</sup> , Marie Grenier <sup>1</sup> , Daria Tokina <sup>1</sup> & Thierry Pérez <sup>1</sup> .....	147	<u>Renata Manconi</u> <sup>1</sup> & Roberto Pronzato <sup>2</sup> .....	158
Molecular Biodiversity of Iranian Persian Gulf Sponges		Systematics of marine sponges from the Bay of Plenty, New Zealand	
<u>Aref Gholami</u> <sup>1</sup> , Majid Askari Hesni <sup>1</sup> , Azad Teimori <sup>1</sup> , Gert Wörheide <sup>2,3,4</sup> , Dirk Erpenbeck <sup>2,3</sup> .....	148	<u>Sam McCormack</u> <sup>1</sup> , Chris Battershill <sup>2</sup> , Michelle Kelly <sup>3</sup> , Phil Ross <sup>2</sup> & Ian Hogg <sup>2</sup> .....	159
Molecular Taxonomy of African Freshwater Sponges		Progress with Poecilosclerida (Demospongiae: Porifera) – more molecular insights into poecilosclerid phylogeny.	
<u>Dirk Erpenbeck</u> <sup>1,2</sup> , Sebastian Mai <sup>1</sup> , Markus Steiner <sup>1</sup> , Astrid Schuster <sup>1</sup> , Gert Wörheide <sup>1,2,3</sup> .....	148	Christine Morrow <sup>1,2</sup> , Bernard Picton <sup>3</sup> & Grace P. McCormack <sup>1</sup> .....	159
New Species And A New Record Of The Genus <i>Leucilla</i> (Calcarea, Calcaronea) To The Tropical Brazilian Coast.		The peculiar spicules in <i>Tethyspira</i> : an apomorphy for <i>Tethyspira</i> or a synapomorphy with Raspailiidae?	
Bruna Bahiana & Fernanda F. Cavalcanti .....	149	Christine Morrow <sup>1,2</sup> , Bernard Picton <sup>3</sup> & Grace P. McCormack <sup>1</sup> .....	160
Taxonomy Of Calcareous Sponges (Porifera, Calcarea) Sampled On Artificial Substrates In A Recreational Marina From The Tropical Brazilian Coast.		Clarifying the status of <i>Raspaciona aculeata</i> versus <i>Raspailia aculeata</i>	
Cleslei Chagas & <u>Fernanda F. Cavalcanti</u> .....	149	Christine Morrow <sup>1,2</sup> , Bernard Picton <sup>3</sup> & Grace P. McCormack <sup>1</sup> .....	161
Biodiversity of calcineans (Porifera, Calcarea) from Martinique, Lesser Antilles, Caribbean Sea		Stir it Up! - Support for the movement of the ‘Bob Marley’ sponge, <i>Pipestela candelabra</i> from Axinellidae to Bubarida	
Tayara Fontana <sup>1</sup> , Fernanda Azevedo <sup>1</sup> , Báslavi Córdor-Luján <sup>1</sup> , Thierry Pérez <sup>2</sup> & <u>Michelle Klautau</u> <sup>1</sup> .....	150	Christine Morrow <sup>1,2</sup> , Olivier Thomas <sup>3</sup> , John N.A. Hooper <sup>4,5</sup> & Grace P. McCormack <sup>1</sup> .....	162
Comparative Transcriptome Analysis Reveals Insights Into The Streamlined Genomes Of Haplosclerid Demosponges		A new species of <i>Hymenaphia</i> Bowerbank, 1864 from the cold water coral reefs off the south west coast of Ireland.	
<u>Christine Guzman</u> <sup>1,2</sup> & Cecilia Conaco <sup>1</sup> .....	151	Christine Morrow <sup>1,2</sup> & A. Louise Allcock <sup>1</sup> .....	162
Beyond the sponge barcode: testing the taxonomic utility of microbial diversity analysis using 16s rRNA gene sequences among tetillid sponges		Taxonomy of <i>Corticium</i> (Porifera: Homoscleromorpha) from Western Australia	
<u>Kathryn A. Hall</u> <sup>1</sup> & John N.A. Hooper <sup>1</sup> .....	151	Karen Sarmento <sup>1</sup> , Anaira Lage <sup>1</sup> , Jane Fromont <sup>2</sup> , <u>Guilherme Muricy</u> <sup>1</sup> .....	163
Taxonomy of Theonellidae in the Indo-West Pacific		Taxonomy of the genus <i>Plakinastrella</i> (Porifera: Homoscleromorpha: Plakinidae) from Western Australia	
Mary Kay Harper <sup>1</sup> , Kathryn A. Hall <sup>2</sup> , Merrick Ekins <sup>2</sup> , Chris M. Ireland <sup>1</sup> , John N.A. Hooper <sup>2,3</sup> .....	152	Barbara Fernandes <sup>1,2</sup> , Anaira Lage <sup>2</sup> , Jane Fromont <sup>3</sup> & <u>Guilherme Muricy</u> <sup>2</sup> .....	163
Six New Species of Verongiid Sponges from Southern Region of Baja California Peninsula, Mexico		High richness of sponges at the mouth of the São Francisco river, in Northeast Brazil: another barrier falls in the Tropical Western Atlantic	
Zvi Hoffman <sup>1</sup> , Patricia Gómez <sup>2</sup> , Carlos Sánchez <sup>1</sup> and Jaime Gómez-Gutiérrez <sup>3</sup> .....	152	Joana Sandes <sup>1,3</sup> , <u>Guilherme Muricy</u> <sup>1</sup> , Ulisses Pinheiro <sup>2</sup> & Carmen Parisotto <sup>3</sup> .....	164
Toward Integrative Taxonomy of Endemic Lake Baikal Sponges Lubomirskiidae		<i>Rhabdastrella fibrosa</i> Hechtel 1983 and <i>Geodia corticostylifera</i> Hajdu et al. 1992 are junior synonyms of <i>Geodia tylastra</i> Boury-Esnault, 1973 (Demospongiae: Astrophorina)	
<u>Valeria Itskovich</u> , Olga Glyzina, Alena Yakhnenko, Oxana Kaluzhnaya .....	153	<u>Guilherme Muricy</u> .....	165
Two new records of marine sponges (Demospongiae: Haplosclerida) from the coast of Karachi, Pakistan		Diversity in inferred mitochondrial proteomes in Phylum Porifera	
<u>Hina Jabeen</u> , Seema Shafique, Zaib-un-Nisa Burhan, Amjad Ali and Pirzada Jamal Ahmed Siddiqui .....	153	<u>Dennis Lavrov</u> <sup>1</sup> , Viraj Muthye .....	165
A first assessment of the sponge biodiversity off the coast of mainland Ecuador		Excavating sponges of Central American Pacific and evidence of a complex of species in <i>Cliona mucronata</i>	
<u>Karla Jaramillo</u> <sup>1,2</sup> , Christine Morrow <sup>2</sup> , Olivier P. Thomas <sup>3</sup> , Jenny Rodriguez <sup>1</sup> , Grace P. McCormack <sup>2</sup> , Eduardo Hajdu <sup>4</sup> .....	154	Cristian Pacheco & José-Luis Carballo .....	166
Molecular Taxonomy and Phylogeography of <i>Ircinia</i> from Western Australia		<i>Suberites</i> From The North Atlantic: Taxonomic Tribulations And Spicule Similitude	
<u>Joseph Kelly</u> <sup>1,2</sup> , Robert W. Thacker <sup>1</sup> .....	154	<u>Raquel Pereira</u> <sup>1</sup> , Mikael Thollessen <sup>1</sup> .....	166
Deeper understanding of deep sea Axinellida: mitochondrial sequencing of a novel abyssal sponge		The International Associated Laboratory MARRIO (France, Brazil, Ireland): Patterns of sponge biodiversity and chemical diversity from Martinique to Rio de Janeiro	

## Varied environments drive rapid divergence in sponge (*Suberites diversicolor*) populations

**Diede Maas<sup>1</sup>, Ke Bi<sup>2,3</sup>, Stefan Prost<sup>4,5</sup>, Maria Meijer<sup>1</sup>, Ludi P. Aji<sup>6</sup>, Gandi Purba<sup>7</sup>, Rosemary Gillespie<sup>8</sup> & Leontine Becking<sup>1,8,9</sup>**

<sup>1</sup> Marine Animal Ecology group, Wageningen University & Research, Wageningen, De Elst 1, the Netherlands. diede.maas@wur.nl

<sup>2</sup> Museum of Vertebrate Zoology, Valley Life Sciences Building, University of California, Berkeley, CA, USA

<sup>3</sup> Computational Genomics Resource Laboratory California Institute for Quantitative Biosciences, University of California, Berkeley, CA, USA

<sup>4</sup> Department of Biology, Stanford University, Stanford, USA

<sup>5</sup> Department of Integrative Biology, Center for Theoretical Evolutionary Genomics, University of California, Berkeley, CA, USA

<sup>6</sup> Marine Life Conservation Unit, Indonesian Institute of Sciences (LIPI), Bosnik Raya, Biak, Papua

<sup>7</sup> Marine and Fisheries Department, University of Papua (UNIPA), Manokwari, Papua

<sup>8</sup> EvoLab, Department of Environmental Science, Policy, and Management, University of California, Berkeley, CA, USA

<sup>9</sup> Naturalis Biodiversity Center, Darwinweg 2, Leiden, the Netherlands

The nature of dispersal barriers for marine taxa often remains elusive. Here, we studied the relative role of stochastic and deterministic variables influencing population divergence, by comparing multiple replicate populations of sponges from marine lakes. Marine lakes are land-locked bodies of seawater with a variable connection with the surrounding sea via subterranean fissures. Furthermore, each lake has a distinct environmental regime (defined as water temperature, salinity and pH). Marine lakes with their discrete populations provide a unique model to study early stages of evolution in coastal marine taxa. We selected lakes that have comparable ages (~8000 years) and sizes (~15000 m<sup>2</sup>), but which vary in degree of connection to the open sea and environmental regimes. Using population genomic methods (double-digest restriction site associated DNA, ddRAD) we studied populations of *Suberites diversicolor* from 8 marine lakes and three adjacent sea locations. In this study ddRAD proved to be a useful and cost-effective method for both phylogeographic and population genomic analyses of sponges. We found strong genetic structure and in most cases strong divergence between populations (pairwise  $F_{ST}$  ranged from 0.54 - 0.63). Admixture analyses furthermore showed little gene flow between marine lakes, even between lakes only 1-10 kilometres apart. We found that at large spatial scales (> 200 km), stochastic dispersal limitation plays a large role, while preliminary analysis showed that environment plays a significant role in the connectivity and divergence of marine lakes populations at smaller scales (< 30 km). Hence, varied environments can lead to rapid divergence of sponge populations. Understanding how gene flow corresponds with environmental gradients will improve predictions on adaptive capacities of marine species under different climate change scenarios.

The Netherlands Organisation of Scientific Research ALW-VENI #863.14.020

## The freshwater sponge fauna of Madagascar: a first assessment

**Renata Manconi<sup>1</sup> & Roberto Pronzato<sup>2</sup>**

<sup>1</sup> Dipartimento di Scienze della Natura e del Territorio, Università di Sassari, Sassari, Italy

<sup>2</sup> Dipartimento di Scienze della Terra, dell'Ambiente e della Vita, Università di Genova, Genova, Italy r.manconi@uniss.it

Spongillida fauna of Madagascar was known only for a single record on *Spongilla alba* (family Spongillidae) since more than two centuries (1887) from the northern small island of Nosy-Bé. *Metania madagascariensis* (family Metaniidae) was recently described by us from the central highlands.

Two field campaigns were carried out in 2011 and 2016 for a total of ca. 80 sampling sites in a wide altitudinal range 0-1600 m asl, along (a) two transects in the Eastern slope and High Plateau, and (b) three transects in the North-Western slope, South-Western slope, and Central-Eastern High Plateau. Sampling season was selected on the basis of rainfalls trend, i.e. at the end of the dry season (September) characterised by the lowest water level in the major hydrographic basins, facing both East (Indian Ocean) and West (Mozambique Channel). A wide range of water bodies, of all climatic areas (*sensu* Köppen), were sampled i.e. springs, streamlets, streams, rivers, crater lakes, and reservoirs, from pristine rainforests to arid lands, and in areas where forests

are now relictual due to alteration by human activities (deforestation, agriculture, mining, and farming). Geographic coordinates, altitude, habitat, and micro-habitat data were collected.

Sponges (ca. 80 specimens) were discovered in 13 of the sampled sites, in both lentic and lotic water bodies, from 6 out of 9 Malagasy classified climatic areas. Here we report on new records for Madagascar of 5 genera of Spongillidae, i.e. *Corvospongilla*, *Ephydatia*, *Eunapius*, *Radiospongilla*, and *Trochospongilla*. The most widespread genera are *Radiospongilla* (5/13 sites), *Trochospongilla* (3/13 sites), and *Eunapius* (3/13 sites). The majority of the samples (over 50) is still problematic. In some cases it is not possible to ascribe them to a presently known genus of Spongillida. Further investigations at the species level are in progress.

From a biogeographic point of view the 7 genera recorded in Madagascar, including *Spongilla* and *Metania* from previous literature are well represented in several continents with many species. *Ephydatia*, *Eunapius*, *Spongilla*, *Radiospongilla*, and *Trochospongilla* are widespread worldwide, while *Corvospongilla* and *Metania* show a prevalent Gondwana range. All recorded genera are known from the Afrotropical Region. Once again field campaign, in unexplored lands, yielded the discovery of a diversified Spongillida fauna.

Research financially supported by Regione Autonoma Sardegna (RAS), INTERREG- EU, PRIN-MIUR, and Fondazione Banco Sardegna.

## Systematics of marine sponges from the Bay of Plenty, New Zealand

**Sam McCormack<sup>1</sup>, Chris Battershill<sup>2</sup>, Michelle Kelly<sup>3</sup>, Phil Ross<sup>2</sup> & Ian Hogg<sup>2</sup>**

<sup>1</sup> University of Waikato, Tauranga, New Zealand samuel.pmccormack@gmail.com

<sup>2</sup> University of Waikato, Tauranga, New Zealand

<sup>3</sup> National Institute of Water and Atmospheric Research Ltd (NIWA), Auckland, New Zealand

Reliable taxonomic assignments are critical to marine conservation strategies, as is an understanding of how biodiversity is distributed. However, the morphological plasticity of marine sponges can make identifications difficult, hence records of distribution patterns can be unreliable and there are frequent gaps in biogeographic knowledge. The need to improve both morphological and molecular based taxonomic methods in order to make it easier to accurately record sponge diversity has been recognised. Here we present a case study of the first taxonomic examination of sponges from a north eastern New Zealand Harbour. Research focused on (1) recording sponge biodiversity from the Bay of Plenty region, (2) undertaking a systematic revision of the fauna correlating classical taxonomy with a modern phylogenetic assessment (3) determine whether identifications based on genetic barcoding are congruent with those produced via traditional morphological methods (alpha taxonomy). Fifty five species are described, of these; there is a possibility of a new genus with eighteen species remaining un-described. We conclude that for New Zealand Demospongiae, sequence variation present in the barcoding region of the COI gene is sufficient to allow for the identification of species.

## Progress with Poecilosclerida (Demospongiae: Porifera) – more molecular insights into poecilosclerid phylogeny.

**Christine Morrow<sup>1,2</sup>, Bernard Picton<sup>3</sup> & Grace P. McCormack<sup>1</sup>**

<sup>1</sup> Zoology Department, Ryan Institute, School of Natural Sciences, NUI Galway, University Road, Galway, Ireland

<sup>2</sup> Queen's University Marine Laboratory, 12-13 The Strand, Portaferry, Northern Ireland

<sup>3</sup> National Museums Northern Ireland, 153 Bangor Road, Holywood, Northern Ireland

Poecilosclerida with around 2210 species is the largest of the demosponge orders and also one of the most diverse in terms of spicule morphology. In a recent revision of Demospongiae (Morrow & Cardenas, 2015)<sup>1</sup>, 5 of the 25 poecilosclerid families were assigned to other orders and the suborder classification, which was based mainly on the presence/absence, and morphology of the chela was abandoned. A new internal classification of Poecilosclerida was considered premature, as there was insufficient molecular data to support it.

The current study is an attempt to fill some the gaps in the molecular classification of Poecilosclerida by analysing newly obtained 18S & 28S rRNA sequences in combination with sequences obtained from previous studies. Species of Hymedesmiidae that possess pore sieves form a monophyletic clade with Crellidae. The