



**24th International Conference on
Subterranean Biology**

24th International Conference on Subterranean Biology

20 – 24 August 2018
University of Aveiro, Portugal

Organized under the Auspices of the
International Society for Subterranean Biology



Information, Program & Schedule



24th International Conference on Subterranean Biology

**20 – 24 August 2018
University of Aveiro, Portugal**

**Organized under the Auspices of the
International Society for Subterranean Biology**

Scientific Committee:

David Culver (USA) (President)
Ana Sofia Reboleira (Portugal)
Annette Summers Engel (USA)
Daniel Fong (USA)
Fernando Gonçalves (Portugal)
Florian Malard (France)
Henrik Enghoff (Denmark)
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Lubomir Kováč (Slovakia)
Markus Friedrich (USA)
Megan L. Porter (USA)
Stefano Taiti (Italy)
Oana Moldovan (Romania)
Peter Trontelj (Slovenia)
Steven Cooper (Australia)
Steve Taylor (USA)
Tanja Pipan (Slovenia)
Tiziana Di Lorenzo (Italy)
William Humphreys (Australia)
William Jeffery (USA)

Organizing Committee:

Chair: Ana Sofia P. S. Reboleira
Natural History Museum of Denmark, University of Copenhagen

Co-chair: Fernando Gonçalves
University of Aveiro

Committee Members: Alberto Sendra, University of Alcalá, Spain; Paulo Borges, University of Azores; Pedro Oromí, University of La Laguna, Spain; Rosalina Gabriel, University of Azores.

Secretariat:

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Libânia Queirós, University of Aveiro
Sara Ribeiro, University of Aveiro
Sérgio Marques, University of Aveiro
Tânia Vidal, University of Aveiro
Telma Veloso, University of Aveiro

Conference Logo Design:

Arn Rytter Jensen, University of Copenhagen

Pre-conference workshops

(<http://24icsb.web.ua.pt/index.php/workshops>)

Saturday 18/08/2018

10:00-13:00 **Workshop 1:** Trait-based analyses in groundwater ecology and bioassessment

Place: Reitoria main Building – Senado room

14:00-17:00 **Workshop 1** (continuation): Trait-based analyses in groundwater ecology and bioassessment

Place: Reitoria main Building – Senado room

14:00-17:00 **Workshop 2:** Governance of subterranean ecosystems – legal approaches & instruments

Place: Reitoria main Building – Traduções room

Sunday 19/08/2018

10:00-13:00 **Workshop 1** (continuation): Trait-based analyses in groundwater ecology and bioassessment

Place: Reitoria main Building – Senado room

10:00-13:00 **Workshop 3:** Genomics of cave invertebrates

Place: Reitoria main Building – Traduções room

10:00-13:00 **Workshop 4:** Riverbed colmation, its effects on stream ecology and restauration and the legal background

Place: Biology Building – 8.1.18 room

14:00-17:00 **Workshop 5:** Guidelines on Laboratory Practices with subterranean fauna

Place: Reitoria main Building – Senado room

24th International Conference on Subterranean Biology

Program

Sunday 19/08/2018

15:30-19:30 Dorm Room Check In – at the Hall of Reitoria Main Building (for those registered with accommodation)

[University of Aveiro](#)

Address:

Campus Universitário de Santiago

3810-193 Aveiro

Phone: +351 234 370 361

GPS Coordinates

40° 37' 53" N

8° 39' 27" W

How to arrive:

<http://24icsb.web.ua.pt/index.php/venue>

University of Aveiro campus map: http://postip.web.ua.pt/docs/mapa_ua.pdf

15:30-19:30 Informal Pre-Conference Gathering & Conference Check-in and registration

Place: Reitoria Main Building

20:00-22:00 Welcome Drink & Dinner

Place: Casa de São Sebastião (Rua São Sebastião, 42)

Monday 20/08/2018

Place: Reitoria Main Building

08:30-10:00 Registration at the Reitoria hall

10:00-10:30 Opening Ceremony
Opening presentation
Ana Sofia Reboleira, University of Copenhagen
Subterranean Biology in the Anthropocene

10:30–11:00 **Coffee break**

Oral Presentations

Only the presenting author is listed in the program. All coauthors and affiliations are listed with each abstract.

Abstracts are available on the USB drive in your registration package and will be online after the conference.

The asterisk identifies students competing for the best oral presentation award.

11:00–12:30 Session 1: Moderators: Rosalina Gabriel & Stefano Taiti

Plenary talk

11:00–11:30 Christian Griebler, Helmholtz Zentrum München

Carbon cycling and food web dynamics in groundwater ecosystems – key drivers and major limitations

11:30–11:45 Tiziana Di Lorenzo, National Research Council of Italy

Predictive ecological risk assessment of pesticide mixtures in Mediterranean porous aquifers

11:45–12:00 * Tobias Siemensmeyer, University of Koblenz Landau

GroundCare – Invertebrates as indicators for untreated water and intrusion of surface water in water supply systems

12:00–12:15 Susanne van den Berg-Stein, Koblenz-Landau University

StygoTracing – preliminary experiments with biological tracers in drinking water extraction areas

12:15–12:30 Daniel Fong, American University, Washington D.C.

Wound melanization response is conserved among albino subterranean arthropods but has been lost in the cave shrimp *Troglocaris anophthalmus*

12:30–14:00

Lunch

14:00–15:30 Session 2: Moderators: Maja Zagamajster & Arnaud Faille

Plenary talk

14:00–14:30 William Jeffery, University of Maryland

Maternal Genetic Effects in *Astyanax* Cavefish Development

14:30–14:45 * Barbara Langille, University of Adelaide

Molecular evolution of ‘eye genes’ in blind diving beetles from the calcrete archipelago of Western Australia: evidence for neutral evolution of phototransduction genes

14:45–15:00 Henrik Enghoff, University of Copenhagen

Subterranean millipedes, patterns and adaptations

15:00–15:15 * Špela Borko, University of Ljubljana

Testing for adaptive radiation in subterranean amphipods

15:15–15:30 * John G. Phillips, University of Tulsa

Genetic diversity of an enigmatic aquifer species from the southeastern United States, the Georgia Blind Salamander (*Eurycea wallacei*)

15:30–16:00

Coffee break

16:00–17:00 Session 3: Moderators: Tiziana Di Lorenzo & Steve Cooper

16:00–16:15 Kym Abrams, University of Western Australia

A remarkable radiation: taxonomy and systematics of Australian short-tailed whipscorpions (Schizomida) in the Pilbara bioregion

16:15–16:30 * Mattia Sacco, Curtin University

Elucidating the food web structure of the subterranean invertebrate communities of arid zone Western Australia

16:30–16:45 Louis Deharveng, Museum national d’Histoire naturelle

Ongoing invertebrate extinctions in a Vietnamese/Cambodian karst biodiversity hotspot

16:45–17:00 Maja Zagamajster, University of Ljubljana

Contribution of range restricted and widespread species to biodiversity patterns in the Western Balkans in Southern Europe

17:00–17:15 William Farmer, American University, Washington D.C.

Long-term multiple-mark multiple-recapture estimates of the population size of *Stygobromus tenuis potomacus* from a hypotelminorheic habitat

17:15 Meeting of the Council of the International Society for Subterranean Biology

18:15 “Traditional Sweet Eggs” hands on workshop (sponsored, regional product)

Tuesday 21/08/2018

Place: Reitoria Main Building

9:00–10:30 Session 4: Moderators: Jill Yager & Paulo Borges

Plenary talk

9:00–9:30 Cene Fišer, University of Ljubljana

Beyond invertebrate troglomorphy: what is the function of the trait?

9:30–9:45 * Aron Katz, University of Illinois

Comparative phylogeography of two cavernicolous springtails (Collembola) codistributed across a geologically complex karst landscape

9:45–10:00 * Heather Gilbert, American University

Amphipod Behavioral Adaptations to the Absence of Surface Water

10:00–10:15 Iva Njunjić, Sorbonne Universités

Comprehensive evolutionary analysis of the Anthroherpon radiation (Coleoptera, Leiodidae, Leptodirini)

10:15–10:30 Kathleen Lavoie, State University of New York College

Seasonal individual size distributions and sex ratios of entrance populations and winter deep cave populations of cave crickets, *Hadenoeus subterraneus*, from caves in central Kentucky, United States of America

10:30–11:00 Coffee break

11:00–12:30 Session 5: Moderators: Ana Komerički & Cene Fišer

Plenary talk
11:00–11:30 Jill Yager, Smithsonian Institution

The remarkable remipedes

11:30–11:45 * Charles Stephen, Auburn University
Unravelling the eastern North American *Hesperochernes* (Pseudoscorpiones, Chernetidae) species complex

11:45–12:00 Yahui Zhao, Chinese Academy of Sciences
Beauty underground: cavefishes in China

12:00–12:15 Andrew Gluesenkamp, San Antonio Zoo
The Mexican Blindcat Project: new discoveries and future efforts

12:15–12:30 Rosalina Gabriel, University of Azores
Conservation concern' bryophytes find refuge on cave entrances in the Azores

12:30–14:00 Lunch

14:00–15:30 Session 6: Moderators: Ana Sofia Reboleira & Michael Slay

Plenary talk
14:00–14:30 Florian Malard, Université Lyon-CNRS
Integrating multiple species criteria and species hypotheses in subterranean biology

14:30–14:45 Slavko Polak, Notranjska Museum Postojna
Phylogenetic position, distribution and morphology of *Adelopsella bosnica* Jeannel, 1908 (Coleoptera: Leiodidae: Cholevinae: Leptodirini) unravel the origin of Old World leptodirines

14:45–15:00 * Ceth Parker, University of Akron
Brazilian Iron Formation Caves Reveal a Novel Mechanism of Microbially Driven Cave Formation

15:00–15:15 Danté B. Fenolio, San Antonio Zoo
The subterranean biodiversity of Delaware County, Oklahoma, USA

15:15–15:30 Michal Rendoš, University of Prešov
Dynamics of collembolan communities inside the forested scree slope

15:30–16:00 Coffee break

16:00–17:15 Session 7: Moderators: Špela Gorički & Henrik Enghoff

16:00–16:15 Maja Zgmajster, University of Ljubljana
Evaluating different conservation approaches to protection of subterranean fauna in Slovenia

16:15–16:30 * Jenna Keany, American University
Subterranean Species in Washington, D.C.: Spatial Analysis, Habitat Preferences, & Urban Conservation Implications

16:30–16:45 * Giulia Perina, Edith Cowan University
Research and stakeholders: Bathynellidae (Bathynellacea, Crustacea) case studies in mining areas. New genera from Australia and the enigma of the “cosmopolitan” *Bathynella* genus

16:45–17:00 Ana Komerički, Fauna & Flora International
Conservation efforts for cave invertebrates and their habitats in Southeast Asia

17:00–17:15 Paulo Borges, University of Azores
Red List of Azorean endemic cave adapted arthropods: an ecological and conservation overview

17:30 Meeting of the IUCN SSC Cave Invertebrate Specialist Group

18:30 Optical equipment demonstration (sponsored)

Wednesday 22/08/2018

Place: Fieldtrip to the major karst massif of Portugal (Estremenho karst massif)

7:30 Departure in front of the Reitoria Building

10:00–12:30 Cave visit

12:30–14:00 Lunch

14:00–16:30 Karst tour

18:00 Return to the University of Aveiro

Thursday 23/08/2018

Place: Reitoria Main Building

9:00–10:30 Session 8: Moderators: Giulia Perina & Lubomir Kovac

Plenary talk

9:00–9:30 Steven Cooper, South Australian Museum

Speciation underground in desert aquifers or just another case of hybridisation by blind beetles?

9:30–9:45 Alejandro Martínez, National Research Council of Italy

Global correlates of diversity in aquatic subterranean fauna

9:45–10:00 Marconi Souza-Silva, Federal University of Lavras

Cave physical attributes influencing the structure of terrestrial invertebrate communities in Atlantic rainforest

10:00–10:15 Rodrigo Lopes Ferreira, Federal University of Lavras

Subterranean biodiversity in a semi-arid tropical limestone outcrop: the role of cave microhabitats and aboveground landscape features in structuring invertebrate communities

10:15–10:30 Maria Elina Bichuette, Federal University of São Carlos

Characterization and perspectives on studies of subterranean invertebrates communities in Latin America

10:30–11:00 Coffee break

11:00–12:30 Session 9: Moderators: Iva Njunjić & Daniel Fong

Plenary talk

11:00–11:30 Grant Hose, Macquarie University

What happens to groundwater ecosystems when you take out the groundwater?

11:30–11:45 Oana Moldovan, “Emil Racovita” Institute of Speleology

Can the subterranean fauna be used as proxy for past environmental changes? – the example of the Carpathians cave fauna

11:45–12:00 Kathryn Korbel, Macquarie University

Biotic distribution within groundwater- is it really unpredictable?

12:00–12:15 * Andreas Marco Hofer, University of Koblenz-Landau

Sampling invertebrates in drinking water supply systems

12:15–12:30 * Enrico Lunghi, Trier University
Linking environmental suitability, abundance and population processes: what determines variation across salamander populations?

12:30–14:00 Lunch

14:00–16:00 Session 10: Moderators: Jenna Keany & Peter Trontelj

Plenary talk

14:00–14:30 Lubomír Kováč, Pavol Jozef Šafárik University
Phylogeny of the genus *Pseudosinella* (Hexapoda, Collembola) from the Western Carpathians caves reveals Miocene diversification

14:30–14:45 Stuart Halse, Bennelongia Environmental Consultants
What does sampling tell us about the ecology of troglofauna?

14:45–15:00 Kazimir Miculinić, Croatian Biospeleological Society
Establishing the monitoring of cave invertebrate fauna and habitats in Croatia

15:00–15:15 Paragamian Kaloust, Hellenic Institute Speleological Research
Diversity and conservation of the cave fauna of Crete (Greece)

15:15–15:30 Alberto Sendra, University of Alcalá
Troglobitic Diplura

15:30–15:45 Raoul Manenti, University of Milan
Preliminary conservation status assessment of cave-dwelling planarians (Platyhelminthes, Tricladida) of Italian Alps and Apennines

15:45–16:00 * Gerhard Du Preez, North-West University
Nematodes down under: State of knowledge and future trends

16:00–16:30 Coffee break and group photo

16:30–18:00 Poster Session

Poster Session

Only the presenting author is listed in the program. All coauthors and affiliations are listed with each abstract.

Abstracts are available on the USB drive in your registration package and will be online after the conference.

The asterisk identifies students competing for the best poster presentation award.

The posters should be delivered in the secretariat on 20th of August from 8:30 to 10:00, during the registration at the Reitoria Main Auditorium.

1

Environmental DNA in subterranean biology update: from “Where?” to “How many?”

Špela Gorički, Scriptorium biologorum, Murska Sobota, Slovenia

2

Hyperparasitism in caves: bats, bat flies and ectoparasitic fungus

Ana Sofia Reboleira, University of Copenhagen, Denmark

3

Light entrains circadian activity rhythm in the microphthalmic cave beetle *Ptomaphagus hirtus*

Markus Friedrich, Wayne State University, USA

4

Exploring the morphospace of subterranean spiders

* Stefano Mammola, University of Torino, Italy

5

Cave and karst fauna conservation in Lower Kinabatangan, Sabah, Malaysian Borneo

Iva Njunjić, Muséum national d’Histoire naturelle, Sorbonne Universités, France

6

Stygobiontic species in genus *Haber* (Clitellata, Naididae, Tubificinae)

Elzbieta Dumnicka, Institute of Nature Conservation, Polish Academy of Sciences

7

1st Croatian Biospeleological expedition – Biokovo 2017

Martina Pavlek, Croatian Biospeleological Society, Croatia

8

Comparative acute toxicity of the pharmaceutical compound Diclofenac on groundwater and surface water crustaceans

* Andrea Castaño Sánchez, University of Copenhagen, Denmark

9

The use of groundwater crustacean communities as indicators for aquifers quality in the semi-arid region of north-central Chile

Tiziana Di Lorenzo, Nacional Research Council of Italy

10

Survival, metabolic rates and locomotory activities of a groundwater-obligate copepod species under long-term exposures to tetrachloroethylene

Tiziana Di Lorenzo, National Research Council of Italy

11

The juliform millipedes of Caucasian caves: *Archileucogeorgia/Leucogeorgia* (Diplopoda: Julida: Julidae) – a forgotten group of diplopods

Hans S. Reip, Senckenberg Museum of Natural History, Germany

12

What's in there and what can it tell us – Exploring the Nucleotide database for cave microbial entries

* Bernardo Barosa, University of Aveiro, Portugal

13

Caves as a source of new antimicrobial agents: The case study of antibacterial activity from microorganisms inhabiting Cerâmica cave, Portugal

* André Gouveia, University of Aveiro, Portugal

14

Assessing bioactive potential of cave bacterial extracts

* Telma Veloso, University of Aveiro, Portugal

15

The IUCN-SSC Cave Invertebrate Specialist Group

Louis Deharveng, Museum national d'Histoire naturelle, France

16

The paleoenvironmental reconstruction using fossil invertebrates of Zăton Lake (south-western Romania)

Oana Moldovan, "Emil Racovita" Institute of Speleology, Romania

17

Comparison of thermal tolerance in Collembola (Hexapoda) inhabiting soil and subterranean habitats

Lubomír Kováč, Pavol Jozef Šafárik University, Slovakia

18

Preliminary study of cave habitat restoration for the conservation of the micro-endemic planarian species *Dendrocoelum italicum*

* Benedetta Barzaghi, Università degli Studi di Milano, Italy

19

Distribution of cultivable filamentous fungi isolated from show caves in the Iron Quadrangle (Minas Gerais, Brazil)

Rodrigo Lopes Ferreira, Federal University of Lavras, Brazil

20

Distribution of herpetofauna in caves of Portuguese karst massifs

Sérgio Marques, University of Aveiro, Portugal

21

Evaluation of the suitability of sinkhole ponds and springs from two Portuguese karst massifs for amphibian early life stage development

Sérgio Marques, University of Aveiro, Portugal

22

A new insight into the Stygofauna Mundi: assembling a global dataset for aquatic fauna in subterranean environments

Alejandro Martínez, National Research Council, Italy

23

Energetic contributions of cave cricket guano to the food base in caves in summer

Kathleen Lavoie, State University of New York College at Plattsburgh, USA

24

Hiding deep underground – two new subterranean beetle genera for Slovenia

Maja Zgmajster, University of Ljubljana, Slovenia

25

A comprehensive database for the cave fauna of Greece

Kaloust Paragamian, Hellenic Institute of Speleological Research, Greece

26

Distribution of cave-dwelling pseudoscorpions (Arachnida) in Brazil

Maria Elina Bichuette, Federal University of São Carlos, Brazil

27

Population dynamics of two troglobitic *Troglorhopalurus* (Scorpiones: Buthidae) scorpions from Brazil

Maria Elina Bichuette, Federal University of São Carlos, Brazil

28

Spatial distribution and population data of cave millipedes, genus *Pseudonannolene* Silvestri, 1895 (Diplopoda, Spirostreptida) from Brazil

Maria Elina Bichuette, Federal University of São Carlos, Brazil

29

Microbial biomass has a key role in immobilization of organic nitrogen in Russão II cave (Goiás, Brazil)

Caio Cesar Pires de Paula, Federal University of São Carlos, Brazil

30

Climatic conditions influence the presence of species in iron ore caves in Brazil

Xavier Prous, Vale S.A, Brazil

31

Subterranean biodiversity in a semi-arid tropical limestone outcrop: the role of cave microhabitats and aboveground landscape features in structuring invertebrate communities

Rodrigo Lopes Ferreira, Federal University of Lavras, Brazil

32

Persistence and stability of cave streams invertebrate assemblages in Brazil

Rodrigo Lopes Ferreira, Federal University of Lavras, Brazil

33

The CAVEheAT project: climate change, thermal niche and conservation of subterranean biodiversity

David Sánchez-Fernández, Universidad de Castilla-La Mancha, Spain

18:00 (First group) Tourist Train Transfer to quay of Traditional Boat (Moliceiro).
Place: In front of Reitoria Main Building

18:15 (First group) Moliceiro trip around Venice-like canals of Aveiro

18:15 (Second group) Tourist Train Transfer to quay of Traditional Boat (Moliceiro)
Place: In front of Reitoria Main Building

18:30 (Second group) Moliceiro trip around Venice-like canals of Aveiro

20:00 End of activity in the quay of Traditional Boat (center of the city)

Friday 24/08/2018

Place: Reitoria Main Building

9:00–10:30 Session 11: Moderators: Martina Pavlek & Markus Friedrich

Plenary talk

9:00–9:30 David Culver, American University

Ecological and Evolutionary Classification of Subterranean Organisms

9:30–9:45 Michael E. Slay, The Nature Conservancy

Preliminary results from a survey of lava tube caves in the southwest region of the Ka'ū district of the Big Island, Hawai'i

9:45–10:00 Pedro Oromí, University of La Laguna
Pyroclast fields: a subsurface subterranean habitat suitable for troglobionts

10:00–10:15 Hans Jürgen Hahn, University of Koblenz-Landau
Quantitative measurement of riverbed colmation and associated ecological studies on sediment fauna

10:15–10:30 * Ester Premate, University of Ljubljana
Locomotion of *Niphargus* amphipods from cave lakes and streams

10:30–11:00 Coffee break

11:00–12:30 Session 12: Moderators: Susana Pallarés & Jean-Jacques Geoffroy

Plenary talk

11:00–11:30 Peter Trontelj, University of Ljubljana
Genetic structure and population size of the largest cave creature in the world, the olm (*Proteus anguinus*)

11:30–11:45 Martina Pavlek, University of Barcelona
Unraveling the evolutionary history of the cave-dwelling Dysderidae in the Dinarides

11:45–12:00 Arnaud Faille, CSIC-University Pompeu Fabra
The Pyrenean radiation of Trechini subterranean beetles

12:00–12:15 Michael Curran, Bennelongia Environmental Consultants
Comparison of eDNA and traditional troglofauna sampling methods

12:15–12:30 Nicole White, Curtin University
What's the potential for environmental DNA (eDNA) to assess stygofauna and troglofauna: pilot studies from Western Australia

12:30–14:00 Lunch

14:00–16:00 Session 13: Moderators: Oana Moldovan & Florian Malard

Plenary talk

14:00–14:30 William Humphreys, Western Australian Museum
Is landscape evolution or climate change the driver of subterranean biodiversity in Cape Range, Western Australia?

14:30–14:45 Susana Pallarés, University of Castilla-La Mancha
Limited thermal acclimation capacity in cave beetles

14:45–15:00 * Stefano Mammola, University of Turin
On climate change and subterranean spiders

15:00–15:15 Thomas Hesselberg, University of Oxford
Behavioural adaptations of cave orb spiders

15:15–15:30 * Ivan Campos-Filho, Federal University of Campina Grande
Contributions to the terrestrial isopods (Crustacea, Isopoda, Oniscidea) from Brazilian caves

15:30–15:45 Hans Jürgen Hahn, University of Koblenz-Landau
The European groundwater water legislation – demand for groundwater ecological research coming from the new drinking water directive

15:15–16:00 Pavel Stoev, Pensoft Publishers
Pensoft's ARPHA Publishing Platform top innovations in OA publishing as demonstrated by Subterranean Biology

16:00–16:30 Coffee break

16:30–18:30 General Assembly of the International Society for Subterranean Biology

18:30 Meeting of the new council of the International Society for Subterranean Biology

20:00 Conference Banquet
Presentation of Best Student Presentations Awards
Place: Meliá Ria Hotel & SPA

Muxima Bio, Ltd

Filsat – Equipamentos Médico Científicos Lda

Oficina do Doce, Aveiro