

Centre International de Myriapodologie [CIM]
International Society for Myriapodology

Newsletter n°5 (November 2020)



Edited by Stylianos Simaiakis

New CIM Council and Board 2019-2021

CIM Council 2019-2021 comprises 13 members

Peter Decker (GERMANY) [**President**]

Nesrine Akkari (TUNISIA) [**Vice-President**]

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Jean-Jacques Geoffroy (FRANCE) [**Associate-Secretary**]

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Piyatida Pimvichai (THAILAND)

Petra Sierwald (USA)

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Cover photograph: "*Marching on..., we are growing stronger*" (Photo: S. Simaiakis)

News on the 19th International Congress of Myriapodology in Colombia

By Daniela Martínez-Torres and Eduardo Flórez Daza

Dear Colleagues,

Greetings on behalf of the organizing committee of the 19th International Congress of Myriapodology (19th ICM), we hope that you, your family, and friends are safe and in the best possible conditions in the middle of the pandemic.

Due to the current situation, where multiple countries have international flight restrictions, and the uncertainty around the development and access to a COVID-19 vaccine, we have decided to postpone the 19th ICM for a year, in order to guarantee the safety of all our participants and organizers. The new date for the event will be from the 16th to the 20th of August, 2022, expecting that by these dates the situation with the pandemic will be under controlled, and we can meet and discuss around Myriapodology.

This change of dates will allow us to create the best conditions to carry out this event and double our effort to fulfill your expectations, while giving the chance to the people whose research was put on hold because of the pandemic to present their results in our congress. These dates were selected to avoid fly tickets cost overruns, and drastic changes in the event's cost once we start the registration and payment process. As we had announced before, the 19th ICM will be held at the Hotel Campestre Las Camelias in Montenegro, Quindío.

Lastly, we will be open to any questions you may have, and you can check our web page (<http://www.19icm.unal.edu.co>) where we will be posting all news related to the event.

President's Report 2020

By Peter Decker, President of the CIM

A highlight of the past year is the publication of the proceedings volumes from 18th ICM in Budapest, Hungary, in *Opuscula Zoologica Budapest* 51 and *ZooKeys* 930. We thank our colleagues Zoltan Korsós and Laszlo Dányi for editing the volumes, Pensoft for fast production, and to the authors as well as reviewers for their valuable contributions.

We are also happy that the CIM LIT online tool, that went online one year before at 18th ICM, was used by many colleagues to add literature references on Myriapoda.

In 2019 we lost our Austrian colleague Erwin Meyer. He was an enthusiastic soil ecologist and myriapodologist and he was the host of the 8th ICM in Innsbruck (1990), 30 years ago.

If you carefully read the financial report of our treasurer Hans Reip below you will recognize, that only 38 to 56 of the 173 CIM members payed the member fees for the last years! Please pay your fee to allow our society to work properly.

But unfortunately the year 2020 will probably remain in our memories because of something else. The COVID-19 pandemic began in 2020 and has had a historic impact on all of our daily lives, our work, our social contacts and the economy worldwide. Some of you will read this Newsletter in a (partial) lockdown. We were all looking forward to 19th ICM in Colombia in 2021, but for the first time in the history of CIM a congress has to be postponed. The decision was not easy, but the uncertainty caused by the pandemic made it necessary to postpone it until 2022. We hope that we will then be able to come together again in an almost normal and real way.

I thank our Secretary Stelios Simaiakis for editing this Newsletter and to CIM Council for your contributions and advice.

Sincere regards,

Peter Decker, President of the CIM

Message from the Secretariat

By Stylianos Simaiakis, General-Secretary of the CIM

Dear friends and colleagues,

I hope this message finds everyone healthy and safe in these stressful times.

As you already know, due to the pandemic and the ongoing health concerns related to COVID-19, the 19th ICM will be postponed for a year for safety reasons. The new date for the 19th ICM will be from the 16th to the 20th of August, 2022. Within the Newsletter 2020 you will find President's Words, Messages from the Secretary & Treasurer (incl. the Financial Report 2020), announcements concerning the next Congress in Colombia in 2022, news about MilliBase and CIM LIT, an obituary for Prof. Erwin Meyer, and new press releases.

Given the opportunity I would like to inform you about the new collection building of the Natural History Museum here in Crete. You probably do not know that on 28 September 2018 a catastrophic fire broke out at Knossos Building at the University of Crete, which was home to the NHMC Collection. The entire building was burned down. It was fortunate that all students were saved and we did not have any injuries. Fortunately, all collections were not destroyed by the fire: 2,500,000 million specimens from Greece and around the world as well as from places that will no longer be visited for decades (e.g. Syria, Libya). This catastrophe brought a new day for the University of Crete and the Museum of Natural History. This year the Museum's collections have been moved to a different building and are being gradually placed in mobile archives. In the near future the collections will be accessible to scientists from all around the world.

Before closing this letter I would like to thank you all for your support and your understanding.

Although I won't have the chance to meet you soon, I truly look forward to meeting you all in two years in South America!

Cordially,

Stylianos Simaiakis, General-Secretary of the CIM

Message from the Treasurer (Financial Report 2020)

By Hans Reip, Treasurer of the CIM

BALANCE - CIM-Accounts			
status of	31.12.2018	31.12.2019	31.10.2020
Postbank	4.772 €	4.772 €	4.772 €
DKB	180 €	47 €	337 €
PayPal		849 €	60 €
Cash			
	SUM	5.668 €	5.169 €

Notes: We still face problems in getting access to the old Postbank account in Paris.

Statistics of Payments for membership fees

Payments for year	
2018	44
2019	56
2020	38
2021	3

Main incomings / expenditures in 2019

incomings / expenditures of 31.12.2019

Membership fees	3.020 €
Website programming 2019	- 3.500 €
Domain fees	- 133 €

Plan for 2021 / 2022

Planned Payments as of 01.01.2021

Website domain fees (2021)	40 €
Website programming (2021)	3.000 €
Presents for next congress-staff (2022)	150 €
Poster award: the fee for next congress (2022)	400 €
SUM	6.190 €

Membership fees for 2020 ...

I would like to ask everybody to pay the current membership fee.

Current fees	
professionals	30 €
students (including Ph.D. students)	10 €

Because we do not run a list of the current status of each member, it is up to you to decide if you are still a student.

We offer two ways for payment:

- via modern and easiest PayPal:
 - receiver address: finance@myriapodology.org

- via the new escrow account at a German bank:
 - Deutsche Kreditbank AG, Berlin
 - receiver: CIM
 - IBAN: DE85 1203 0000 1031 8717 99
 - BIC/SWIFT: BYLADEM1001

Please state the purpose of payment:

- your full name,
- your country with which you are registered in the CIM,
- if applicable, your student status and
- the years for your payment.

Please always choose the payment option, with that you will take over any fees of the money transfer! You should pay for several years together!

If there are arising any questions, please send a note to finance@myriapodology.org.

CIM LIT - The Online Myriapod Literature Reference Input Tool

By Peter Decker, President of the CIM

One of the main aims of the CIM, when it was founded in 1968, was to compile the published literature on the subject of Myriapodology to spread knowledge of new papers. In July 2019 on the 18 International Congress of Myriapodology in Budapest the Online Myriapod Literature Reference Input Tool (CIM LIT) went online first to replace the Questionnaire that was used until 2013. The CIM LIT (cms.myriapodology.org) is an online tool from the Centre International de Myriapodologie to compile all literature references on Myriapoda. It allows all CIM members to easily input their publications on Myriapoda as well as missing citations from other authors or publications.

CIM LIT currently contains about 16.800 references, with ca. 340 new citations from 45 registered users since July 2019.

Please register to fill gaps and keep the database up-to-date. Your account is immediately activated! It may take up to one hour to receive the confirmation mail and it may be sent to your spam folder.

You can input different types of literature: article, article in a proceeding, book, and chapter in book, book in a book series or thesis/report. Before entering a reference, please check MyriaLit to avoid duplicates. Please understand that it may take a few days until your entries are validated manually. Existing entries can only be changed directly in the database and not via the CIM LIT tool.

For changes, questions or problems please contact Peter Decker.

MilliBase - A global species catalogue of the myriapod class Diplopoda

By Deter Decker, Jörg Spelda & Petra Sierwald

Taxonomic databases are a useful and important tool for identification of species, revision or description of taxa or in compiling faunal lists. For both professionals and beginners in specific taxon groups the scattered literature is often an obstacle that needs to be overcome and published taxonomic catalogues are scarce or already outdated. MilliBase (<http://www.millibase.org>) is a global taxonomic database, managed by a group of 18 myriapod experts that aims to capture all described millipede, pauropod and symphylan species with the associated literature, the authorities and original descriptions of species, genera and all units of higher classification. The database contains more than 31,400 taxon names and about 23,500 species names. Generic synonyms have largely been added to the database, but species-level synonymies are still under development. MilliBase also strives to add secondary citations from the taxonomic and systematic literature for all taxa, as well as important ecological and physiological works. The following taxon groups were already checked and edited and can be used as a taxonomic reference catalogue: Dalodesmidae, Harpagophoridae, Sphaerotheriida and Spirostreptidae.

Currently the following taxa are in progress: Cambalidea, European Chordeumatida, European Julida, European Glomerida, Pachybolidae, Paradoxosomatidae, Rhinocricidae, and Polyzoniida.

We are looking for more experts to join our team of editors to continuously update and improve the database to promote all forms of current and future millipede research and to support an active and vibrant global millipede research community. If you are interested please contact Petra Sierwald (psierwald@fieldmuseum.org).



Proceedings of the 18ICM, Budapest 2019

By Laszlo Dányi & Zoltán Korsós

The proceedings of the 18th International Congress of Myriapodology held in Budapest 2019 were published in a special issue of ZooKeys and the Opuscula Zoologica Budapest. Please enjoy all the 18 (11+7) interesting articles resulting from this congress:

Korsós, Z. & L. Dányi (2020): Proceedings of the 18th International Congress of Myriapodology, Budapest, Hungary (25–31 August 2019). - ZooKeys 930: 230 pp. [Download Link](#)

Dányi, L. & Z. Korsós (2020): Proceedings of the 18th International Congress of Myriapodology, Budapest, Hungary (25–31 August 2019). – Opuscula Zoologica Budapest, 51, Supplement 2: 103 pp. [Download Link](#)

Honorary Members

The present list of CIM honorary members is (in alphabetical order):

Wolfgang DOHLE (Germany), Henrik ENGHOFF (Denmark), Jean-Jacques GEOFFROY (France), Sergei Illitch GOLOVATCH (Russia), Richard Desmond KIME (France), John G.E. LEWIS (UK), Jean-Paul MAURIÈS (France), Bjarne MEIDELL (Norway), Robert MESIBOV (Australia), Alessandro MINELLI (Italy), Monique NGUYENDUY-JACQUEMIN (France), Jörg ROSENBERG (Germany), Hilke RUHBERG (Germany), Ulf SCHELLER (Sweden).

Also,

Late Gordon BLOWER (UK), Late Jean-Marie DEMANGE (France), Late Wolfram DUNGER (Germany), Late Kazimeria GROMYSZ-KALKOWSKA (Poland), Late Richard L. HOFFMAN (USA), Late Casimir A. W. JEEKEL (The Netherlands), Late Otto KRAUS (Germany), Late Stefan NEGREA (Romania), Late Maija PEITSALMI (Finland).

Obituary (Univ. Prof. Dr. Erwin Meyer 1948–2020)

By Julia Seeber & Michael Steinwandter

Erwin Meyer died very unexpectedly in his sleep on June 7, 2020 at age 71. He was an enthusiastic soil ecologist who admired the diversity of all organisms living in the soil, but, besides earthworms, his true passion were the millipedes. In 1976 he started working as a university assistant at the University of Innsbruck (Austria), where he was to stay until his retirement in 2013. He completed his doctorate in 1978 and habilitated in the field of zoology in 1986. During his years at the University he studied soil invertebrates and taught courses on terrestrial field methods, animal ecology, and soil zoology. His students remember him as a vivid and fervent teacher, whose main aim was to spark the passion of the students of biology and teacher training. He inspired young people of many decades to study ecology and to understand the link between animals and their habitats.

He started working on millipedes during his doctorate, studying their species diversity and distribution in all kinds of habitats, but mostly and preferably in montane and alpine regions. One of his favourite millipedes was *Ommatoiulus sabulosus*, a periodomorphic species widely distributed in the Central Alps. Obergurgl in the Oetz Valley, where the University of Innsbruck operates a research centre, and the LTER site “Kaserstattalm” in the Stubay Valley (both in Tyrol) were important study sites, but also Vorarlberg, where he originates from, and South Tyrol (Italy), where his wife Sieglinde was born. He conducted many studies with his late colleague Konrad Thaler, and later managed to change from descriptive to explorative research. Within the Department of Ecology, he headed the working group “Soil Ecology” until his retirement, but his work continues in the “AlpSoil Lab” at the Institute of Alpine Environment (Eurac Research, South Tyrol), headed by us, two of his former students.

In his spare time, Erwin was a keen gardener and a mountaineer, roaming the Alps all year round, either on foot or on skis. He loved cross-country skiing and spent an annual holiday in Scandinavia to participate in a competition to cross Finland. With him we lose not only a passionate researcher and teacher, but a mentor and, most importantly, a good friend.



Erwin Meyer (Photo: Michael Steinwandter)

Selected publications of Erwin Meyer on Myriapoda:

1973: **Meyer E.**: Über die Diplopoden Nordtirols und Vorarlbergs (Kritische Artenliste, mit biologischen Daten aus der Literatur). *Diploma thesis*, University of Innsbruck: 102 pp.

1974: Thaler K., **Meyer E.**: Fragmenta Faunistica Tirolensia, II (Diplopoda, Chilognatha: Julidae, Craspedosomatidae). *Berichte des naturwissenschaftlichen-medizinischen Verein Innsbruck*, 61: 93–99.

1975: **Meyer E.**: Über einige Diplopoden aus dem Rätikon (Vorarlberg, Österreich). *Berichte des naturwissenschaftlichen-medizinischen Verein Innsbruck*, 62: 63–69.

1979: **Meyer E.**: Life-cycles and ecology of high alpine Nematophora. In: Camatini M. [Ed.]: *Myriapod biology*, Academic Press, London, 456pp., 294–306.

1983: **Meyer E.**: *Trimeophorella paradisia* n. sp., ein nivaler Diplopode aus dem Gran Paradiso-Nationalpark (Grajische Alpen, Italien) (Diplopoda: Chordeumatida: Neoatractosomatidae). *Berichte des naturwissenschaftlichen-medizinischen Verein Innsbruck*, 70: 99–104.

1984: Phillipson J., **Meyer E.**: Diplopod numbers and distribution in a British beechwood. *Pedobiologia*, 26: 83–94.

- 1985: **Meyer E.**, Eisenbeis G.: Water relations in millipedes from some alpine habitat types (Central Alps, Tyrol) (Diplopoda). *Bijdragen tot de Dierkunde*, 55: 131–142.
- 1985: **Meyer E.**: Distribution, activity, life-history and standing crop of Julidae (Diplopoda, Myriapoda) in the Central High Alps (Tyrol, Austria). *Holarctic Ecology*, 8: 141–150.
- 1990: **Meyer E.**: Altitude-related changes of life histories of Chordeumatida in the central Alps (Tyrol, Austria). In: Minelli A. [Ed.], *Proceedings of the 7th International Congress of Myriapodology*. E.J. Brill, Leiden, 480pp., 311–322.
- 1992: Kofler E.M., **Meyer E.**: Lebenszyklus, Abundanz und Produktion von *Enantiulus nanus* (Latzel) in einem inneralpinen Eichenmischwald (Tirol, Österreich). *Bericht des naturwissenschaftlich-medizinischen Vereins in Innsbruck*, 10 Supplementum: 153–166.
- 1996: **Meyer E.**, Marsoner P., Fischer E.: Population metabolism of millipedes at two altitudinal zones in the central Alps (Tirol, Austria). *Mémoires du Muséum national d'histoire naturelle*, 169: 451–460.
- 1997: **Meyer E.**, Singer A.: Distribution, seasonal activity and abundance of millipedes in forests of Voralberg (Austria). *Bericht des naturwissenschaftlich-medizinischen Vereins in Innsbruck*, 84: 287–306.
- 2006: Seeber J., Scheu S., **Meyer E.**: Effects of macro-decomposers on litter decomposition and soil properties in alpine pastureland: A mesocosm experiment. *Applied Soil Ecology*, 34: 168–175.
- 2008: Seeber J., Seeber G.U.H., Langel R., Scheu S., **Meyer E.**: The effect of macro-invertebrates and plant litter of different quality on the release of N from litter to plant on alpine pastureland. *Biology and Fertility of Soils*, 44: 783–790.
- 2009: Seeber J., Langel R., **Meyer E.**, Traugott M.: Dwarf shrub litter as a food source for macro-decomposers in alpine pastureland. *Applied Soil Ecology*, 41: 178–184.

SCHUBARTIANA - Journal of the German-speaking Myriapodologist's Working group

SCHUBARTIANA is the scientific journal, edited and published by the German-speaking Myriapodologist's Working Group. It is named after the German Myriapodologist Otto Schubart. The first issue was published in December 2005.

SCHUBARTIANA aims to address all people interested in Chilopoda and Diplopoda as well as Pauropoda and Symphyla. We encourage both amateurs, advanced or professional myriapodologists to submit their contributions. This journal wants to represent a platform for manuscripts and topics not fitting the scope and aims of major journals. No data should get lost in your desk!

SCHUBARTIANA is open for all publications in the field of Myriapodology. Although the scope is on Europe and Central Europe, contributions to other geographical regions are welcome too. A broad range of works are considered for publishing: taxonomic (re-) descriptions and revisions, identification keys, phylogenetic studies, physiology, functional morphology, ecology, faunal lists and checklists, distribution atlases, methodology, collection catalogues, literature reviews, databases, software, as well as short communications, e.g. interesting faunistic records.

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Western Caucasian caves reveal hidden biodiversity of hydrophilous millipedes

By Dragan Antić

The caves have long been known as unique habitats for harboring interesting, and often fascinating animals. These animals, usually referred to as troglobionts, spend their entire lives underneath the surface and had to adapt to the special conditions prevailing in underground habitats. Among these are the complete absence of light, reduced oxygen concentration, high humidity, relatively constant temperature, but also food scarcity. At the very core of adaptation are progressive genetic changes, which result in the amelioration of a character in terms of its function. Such an improvement has a selective advantage and becomes predominant in the population. Adaptation processes are usually very slow but can be accelerated by various additional selection pressures, which, in a resource-poor environment, can be more pronounced. The most noticeable changes in cave organisms, that are easily recognizable to laymen, are morphological changes. These include a series of regressive and progressive evolutionary changes that occurred in the process of adaptation to life in underground conditions. The most striking morphological changes of troglobionts are depigmentation of the body, partial or complete reduction of the visual perception, as well as elongation of the appendages. However, there are some additional troglomorphic changes that may be specific to certain groups or taxa.

There are many groups of terrestrial arthropods that have their representatives underground. Millipedes (Myriapoda, Diplopoda) are no exception, and over 400 species of troglobitic millipedes have been described worldwide to date. It is well known that one of the richest regions, not only with troglobitic millipedes, but with troglobitic animals in general, is the Balkan Peninsula. This region is inhabited by around 150 described troglobitic millipedes. In recent years, the caves of the Western Caucasus have also proven to be very rich in troglobitic arthropods, including millipedes. In a recent monograph about Caucasian Leucogeorgiini (Diplopoda, Julida), Antić and Reip (2020) described 11 new species of the genus *Leucogeorgia* Verhoeff, 1930, as well as a new monotypic genus *Martvilia* Antić & Reip, 2020, mostly from the caves of the Western Caucasus. Thus, the number of leucogeorgiinine species from the Caucasus has increased to 17. With the exception of *Leucogeorgia satunini* (Lohmander, 1936) and *L. oculata* Antić & Reip, 2020, all species of the

genus *Leucogeorgia*, including also *Martvilia parva* Antić & Reip, 2020, are found exclusively in caves. The authors regarded all of these species as troglobionts, with more or less pronounced troglomorphic characteristics, such as body depigmentation, elongate appendages and the loss of ommatidia. However, what is interesting is that, in addition to these morphological changes, some of the species “have gone a step further”. Of the 17 species of Caucasian leucogeorgiines, as many as eight are characterized by “highly modified mouthparts, presumably for filtering diet in water or on thin films of water in very humid places in the caves”. As the authors point out, some individuals were caught underwater, where they were either immobile or poorly mobile, despite a strong water current. This seems to be evidence that these animals have adapted to the amphibious way of life in the cave, where they enter cave water bodies and most likely feed by filtering sediment. Evidence that these animals switched from a diet of decaying organic matter to a filtering diet is the highly modified mouthparts. These modifications are clearly reflected in the reduction of the biting parts of the mandibles, in the hypertrophied pectinate lamellae, as well as in modifications of the labrum and gnathochilarium, compared to their saprophagous congeners. In addition, these animals are easily distinguished from their relatives with normal mouthparts by a slightly elongated head, body with fewer body segments, more elongated legs, and long tarsal claws, which allow them to more easily adhere to underwater sediment. Although the phenomenon of modified mouthparts is rare among millipedes, it is not unknown. The first species with such modifications was described by Verhoeff almost a century ago. That was the Caucasian species *Leucogeorgia longipes* Verhoeff, 1930. Since then, until the monograph by Antić & Reip (2020), only a few species of amphibious cave millipedes with modified mouthparts have been described, so as a result of this study the number of millipedes with this phenomenon has increased significantly.

Another interesting fact recorded by the authors is the presence of two species of the genus *Leucogeorgia* with modified mouthparts that may live in sympatry or even syntopy in Western Caucasus. A striking example that the authors mention is the vertical distribution of *L. turbanovi* Antić & Reip, 2020 and *L. profunda* Antić & Reip, 2020 in the Krubera cave, where *L. turbanovi* lives closer to the surface to a depth of -100 m, while *L. profunda* occurs in the deep part of the cave (-1650 m). The same pattern was observed in several other deep caves in the western Caucasus, with always *L. turbanovi* living closer to the surface (-7 m, -30 m, -120 m), while *L. profunda* is found much deeper (-1260 m, -1360 m, -1370 m). *L. profunda* is, together with the chordeumatid

Heterocaucaseuma deprofundum Antić & Reboleira, 2018, the deepest-occurring millipede globally. On the other hand, in the Nytshka cave, *L. turbanovi* and *L. mystax* Antić & Reip, 2020, occur syntopically. Both species have modified mouthparts, these are far more bizarre in *L. mystax*, which might imply different lifestyles and diets, as pointed by the authors. The species *L. mystax* took its name due to the presence of very long setae laterally on the gnathochilarium resembling of the mustache (= *mystax* in Latin), when the head of the individual is viewed from the dorsal side.

The millipedes, brought up to light for the first time in this work, and their fascinating morphology, remain enigmatic on several respects and their functional morphology and ecology will certainly be important to understand their evolution and how they succeeded to colonize the underground world.

Antić D.Ž. & Reip H.S. (2020) The millipede genus *Leucogeorgia* Verhoeff, 1930 in the Caucasus, with descriptions of eleven new species, erection of a new monotypic genus and notes on the tribe Leucogeorgiini (Diplopoda: Julida: Julidae). *European Journal of Taxonomy*, 713: 1–106. <https://doi.org/10.5852/ejt.2020.713>



Figure 1. *Leucogeorgia* Verhoeff, 1930 species *in situ*. **A.** *L. abchasica* (Lohmander, 1936) with normal mouthparts. **B.** *L. profunda* Antić & Reip, 2020, with modified mouthparts. **C.** *L. turbanovi* Antić & Reip, 2020, with modified mouthparts. Modified from Antić & Reip (2020).

Hidden species in caves and hidden treasures in Museums

By Nesrine Akkari & Dragan Antić

Natural history collections represent a wealth of recent and historical material. In a perpetual motion, they allow to gaze through the past, and analyse geological events and evolution of taxa. They are also a window to the future from which contemporary information is passed to next generations. Scientific collections and scientific research are entwined, and their synergy is vital for any scientific progress. Systematic revisions of taxa are based on collections and represent a highly demanding exercise, requiring a global knowledge of the given taxonomic group. These revisions generally allow to overcome impediments related to different limitations met by other taxonomists in the past. In fact, original descriptions are improved by implementing standard terminologies, providing detailed information on species morphology and distributions by using modern methods. They may also help understanding species interrelationships in a phylogenetic context when analysed molecularly, etc. Taxonomic revisions highly depend on existing collections, in addition to the effort of collecting new specimens. While performing a taxonomic revision, scientists often require reference material of the given taxa, information from original descriptions and related publications, and authentic documents. Sometimes even acquisition registers and other museums' documents or even personal notes of the authors and their correspondence were sought for to help solving riddles and clarifying information on species identities, distribution, etc. In this context, we [Antić & Akkari (2020)] recently wrote a monograph in which we revised the systematics of the European millipede genus *Haasea* Verhoeff, 1895 (Diplopoda, Chordeumatida). To accomplish this work, we revised the taxonomy of the 17 known species of this genus and examined thousands of specimens from the Natural History Museum of Vienna collections and freshly collected samples. We also studied reference material housed in the same and other Natural History Museums (Berlin, Geneva, Munich, Sofia, etc.). Our work has led to the discovery of two species new to science from Austria and from Serbia, respectively. One of the two new species, *Haasea makarovi* Antić & Akkari, 2020 was recently collected from the cave Bezdan, Kamena Gora, near Prijepolje in Serbia. The second new species, *Haasea gruberi* Antić & Akkari, 2020 was discovered among the numerous historical specimens of Vienna Museum and incidentally encountered when examining the collections. In fact, the few specimens of the Austrian species were collected by the famous collector H. Franz in 1948 from Nattarriegel in Styria and identified as *Haasea flavescens* by the Austrian myriapodologist Attems in the next

couple of years. Mistaken for another known taxon, the new Austrian species remained somehow veiled on a shelf of the collections for more than 70 years and was perhaps as cryptic as *H. makarovi* Antić & Akkari, 2020, the newly discovered congener from a Serbian cave.

Performing this revision was very gratifying but of course not free of challenges. In fact, we had a hard time trying to understand the gonopod structures and agree on a standard terminology for the genus, especially that it was divided in different groups by different authors, who used different terms for the gonopod structures.

Additionally, some species described more than 120 years, or around that period, were found in a very poor condition. For example, most of Verhoeff's type material consisted of permanent slide preparations, where only parts of specimens were mounted, allowing the examination of the structures in one or at most two positions. Slides containing the gonopods of syntypes and used for the original description of the species were sometimes in very bad status, which resulted in selecting other specimens as a lectotypes. In fact, selection of lectotypes for most species was necessary to fix the status of the taxa, whose descriptions was based on a series of syntypes divided between Museums. This meant sometimes the restriction of the known type localities of some taxa. The nomenclature of several species was also fixed to avoid repetition of mistakes. Having a more or less global view on the different, we proposed and justified six new synonymies within the genus.

Besides the taxonomic chaos, information on geographic localities was lacking for several species. Most of Latzel material had, for example, the label "Österreich-Ungarn", which does not allow for much interpretation as regards the occurrences of species and their respective distributions. Attems wrongly assigned several described and undescribed taxa from his own collection to *H. flavescens*, inadvertently generating what was called the "*H. flavescens* syndrome" that strongly affected the taxonomy of the genus. In fact, almost half of the known species of this genus was determined and treated by Attems and in all subsequent literature as *H. flavescens*. This led to grave mistakes in identifying species and delimiting their respective distribution ranges. To solve this, most of the material labelled as *H. flavescens* in the collections of the Natural History Museum Vienna was re-examined and that was not an easy task.

We also went through all the known literature and tried to retrace species distribution ranges based on the new synonymies and corrections made in species identifications.

To capture the different difficulties encountered during the revision of such a difficult taxon, the genus *Haasea* Verhoeff, 1895 (Diplopoda, Chordeumatida, Haaseidae) was referred to as one of a tumultuous history and chaotic records in the title of our monograph recently published in *Zootaxa*.

One of the leading experts of the order Chordeumatida, Professor Emeritus Dr. William (Bill) Shear said:

“This is a wonderful accomplishment. You had to deal with tangles in the literature that those of us in North American can hardly conceive! I also congratulate you on the beautiful illustrations such as the very sharp and clear SEM pictures and finely executed drawings. This paper sets a real standard for future work in millipede systematics.”

Antić D. & Akkari N. (2020) *Haasea* Verhoeff, 1895—a genus of tumultuous history and chaotic records— redefinition, revision of taxonomy and geographic distributions, with descriptions of two new species from Austria and Serbia (Diplopoda, Chordeumatida, Haaseidae). *Zootaxa*, 4798 (1): 001–077. <https://doi.org/10.11646/zootaxa.4798.1.1>



Figure 1. *Haasea hungarica* (Verhoeff, 1928) from Serbia, *in vitro*. Modified from Antić & Akkari (2020).

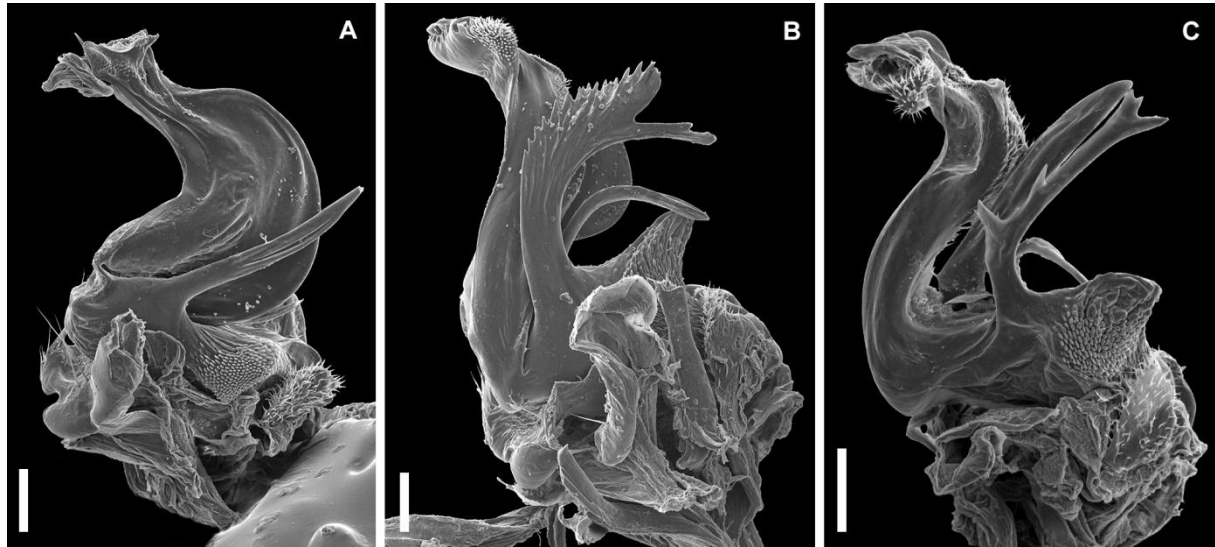


Figure 2. Left angioxocites of the anterior gonopods of some species of the genus *Haasea* Verhoeff, 1895, mesal views. **A.** *H. cyanopida* (Attems, 1903). **B.** *H. flavescens* (Latzel, 1884). **C.** *H. makarovi* Antić & Akkari, 2020. Scale bars: 0.1 mm. Modified from Antić & Akkari (2020).

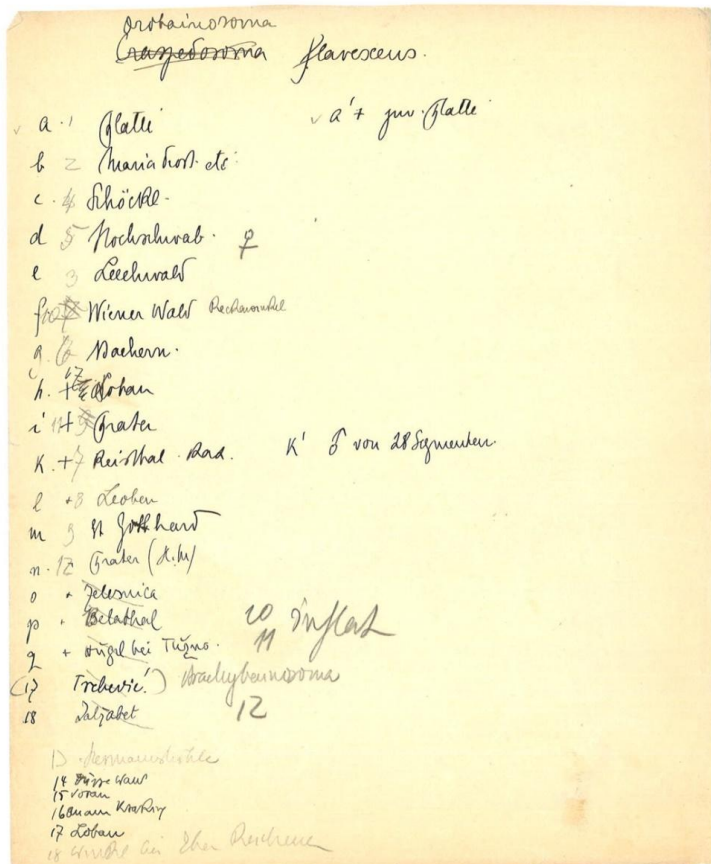


Figure 3. Attems personal collections catalogue in NHMW. Originally, the listed localities correspond to *H. flavescens*. Later, Attems crossed out those that correspond to other species he misidentified as *H. flavescens*. Photo from Antić & Akkari (2020).

Fox gorges on 63 centipedes in one night, gut analysis shows

By Kate Taylor (Australian Geographic)

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Fox gorges on 63 centipedes in one night, gut analysis shows

The fox was found to have eaten up to 63 centipedes in just one night.

By Australian Geographic • June 15, 2020 • Reading Time: < 1



The centipedes found in the foxes stomach were a surprise to station manager Kate Taylor. Image credit: Kate Taylor/Bush Heritage

FOX GUT ANALYSIS is a big part of Bush Heritage project officer Kate Taylor's job. Out on Bon Bon Station Reserve in outback South Australia, it's important to know what these feral pests are eating.

"It tells us which native species they are eating and therefore impacting," Kate says. "It shows the difference of prey species between feral cats and foxes, and we can also look at prey type across different seasons."

But when Kate found the remains of 63 centipedes she was surprised. "While dissecting and analysing stomach contents is quite messy and smelly work not for the faint-hearted, it is always fascinating to see what these animals have been eating."



"When we tipped out the contents of this particular stomach I was completely blown away. In addition to the 63 individual centipedes weighing 155 g, there were two small mammals and one gecko."

According to Kate, centipedes make up a good part of the foxes diet. "Centipedes form part of both fox and feral cat diets however they are found more often in fox stomachs. Foxes are also known to eat scorpions."