

Centre International de Myriapodologie [CIM]
International Society for Myriapodology

Newsletter n°4 (December 2019)



Edited by Stylianos Simaiakis

New CIM Council and Board 2019-2021

The new CIM Council 2019-2021 comprises 13 members:

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

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

Stylianos Simaiakis (Greece) [**General-Secretary**]

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

Hans Reip (Germany) [**Treasurer**]

Dragan Antic (Serbia)

Lucio Bonato (Italy)

Amazonas Chagas-Junior (Brazil)

László Dányi (Hungary)

Carsten Müller (Germany)

Piyatida Pimvichai (Thailand)

Petra Sierwald (USA)

Varpu Vahtera (Finland)

The 19TH International Congress of Myriapodology, Quindío, COLOMBIA, August 2021

FIRST MESSAGE TO THE MYRIAPODOLOGICAL COMMUNITY

Warm greetings to all myriapodologists and onychophorologists of the World! We are pleased to announce that the next Congress of the International Society of Myriapodology will be held in Colombia, August 2021. First, we would like to thank the assistants to the 18th ICM in Budapest, Hungary, for their trust in our proposal for the headquarters of the 19th ICM. We have formed a Committee, that is eagerly working in organizing an event that lives up to your expectations.

At the moment, we can communicate to the international myriapodological community that the event is going to take place in a country hotel located in the Colombian department of Quindío (within the coffee-producing region of Colombia), nestled in the Central Andes Mountain Range, with a pleasant mild climate throughout the year. We have selected this region for its breathtaking landscapes, its multiple tourist attractions, and because it was the location of previous international academic events, with excellent results.

Colombia is strategically located in Northeastern South America, serving as a bridge between North and South America. The country has a significant network of flight connections with Europe and the rest of the World. As a neotropical country with immense biodiversity, which includes the so far understudied myriapod fauna, we believe our country to be an interesting destination; in addition to that, we will be among the traditional coffee culture, enjoying the best coffee of the world!

Further information on the event will be available soon on our website www.19icm.unal.edu.co.

Finally, we wish you a joyful holiday season and a wonderful new year!, and we look forward to seeing you all at the 19th ICM...!

**ORGANIZING COMMITTEE, 19th INTERNATIONAL CONGRESS OF MYRIAPODOLOGY,
COLOMBIA 2021.**

Presidential Report 2019

By Peter Decker, President of the CIM

We look back on a successful 18th International Congress of Myriapodology in beautiful Budapest, Hungary. Zoltan Korsós and his team provided excellent conditions to present a broad spectrum of research areas and topics around Myriapoda. We are all looking forward to the 19th ICM, which will be take place in Quindío, Colombia, in 2021. It will be the first International Congress of Myriapodology in South America and an important sign – a lighthouse – for this continent to draw attention to Myriapoda & Onychophora.

This year was also a year of change. We lost many CIM members and colleagues, that contributed to Myriapodology (see obituaries in this issues below) but luckily we see many young students who began to study these animals.

We had a dramatic change in the CIM Executive Committee. Gregory Edgecombe was elected as president of the CIM in Brisbane in 2011. During the last 8 years he was always a humorous, hardworking, open-minded team player and under his guidance the CIM underwent some dramatic changes: The era of the CIM Bulletin ended in 2014, but the CIM Newsletter was born. The International Congresses of Myriapodology will take place every two years, instead of every three years! The old orphaned CIM website has been replaced by www.myriapodology.org. Several issues with the CIM's old French bank account led to the decision to open a new bank account, but you can now pay the fee with PayPal! In order to offer a digital alternative for the annual list of publications in the field of myriapodology the CIM LIT was developed. All this could only be achieved by a good team and a good leader.

I say thanks to the former Vice President Bruce Snyder and the former Council members Karin Voigtländer, Ivan Tuf, Julian Bueno-Villegas and Thomas Wesener for their good work and cooperation over the past years. The CIM Council was also renewed with seven new Council Members and a new Vice President, Nesrine Akkari. I thank also our Secretary Stelios Simaiakis, who is the creator of the CIM Newsletter and the hard drive of all communications and congresses.

I look forward to develop CIM further in the future with a good team of young and committed people to keep this community together.

Finally, unfortunately, I have to address the poor morale of paying CIM membership fees. Even today, more than 50% of the fees have not been paid. Please read Hans Reip's Treasurer Report carefully and find out about the many possibilities of paying fees!

Sincere regards,

Peter Decker, President of the CIM

Message from the Secretariat

By Stylianos Simaiakis, General-Secretary of the CIM

After missing the last Congress in Thailand, it was great to be back and see so many friends in Budapest at the 18ICM. CIM Society gained new members and friends at the 18ICM while the Executive Committee and the CIM Council had a serious renewal. I would like to take this opportunity to thank all re-elected and newly-elected Councillors for the period 2019-2021.

I would like to express my gratitude to Greg Edgecombe, the President of the CIM Society for the last 8 years, for his hard work, watchfulness and kindness. His infinite passion inspired all of us to improve our myriapodological community.

I would like also to thank Dr Zoltán Korsós and all the members of the organizing committee for making all necessary arrangements and preparations for a successful 18ICM.

I am also glad to announce that during the farewell dinner of the congress in Budapest, Prof. Henrik Enghoff became an Honorary Member of the CIM Society.

Within the Newsletter you will find new President's Words, the Report of the General Assembly in Budapest, the Financial Report 2019, news about CIM LIT, new press releases, obituaries, and announcements concerning the next Congress in Colombia in 2021.

I look forward to meeting you all at the 19ICM, in South America, in two years.

Cordially,

Stylianos Simaiakis, CIM General-Secretary

Report on the CIM General Assembly held on Friday, 30 August 2019, Budapest, HUNGARY

By Stylianos Simaiakis, General-Secretary of the CIM

CIM members were officially invited to participate to the General Assembly (GA) at Budapest (Hungary), on Friday 30 August 2019, during the 18th International Congress of Myriapodology (18ICM), in accordance with the following agenda.

To be valid, the GA must comprise a minimum of 20 active members in good standing. Those unable to join the GA can formally be represented by an active member should they provide a written statement confirming this representation.

Were present or represented (in alphabetical order):

Akkari Nesrine (Tunisia), Antić Dragan (Serbia), Baba Stefan (Romania), Bienias Jakub (Poland), Bonato Lucio (Italy), Bueno-Villegas Julian (México), Calvanese Victor (Brazil), Chagas Amazonas (Brazil), David Jean-Francois (France), Decker Peter (Germany), Djursfoll Per (Norway), Dolejš Petr (Czech Republic), Edgecombe Gregory (United Kingdom), Enghoff Henrik (Denmark), Evsyukov Aleksandr (Russia), Ganske Anne-Sarah (Austria), Geoffroy Jean-Jacques (France), Golovatch Sergei (Russia), Hannibal Joseph (USA), Huynh Cuong (Australia), Ilić Bojan (Serbia), Karam-Gemael Manoela (Brazil), Koch Markus (Germany), Korsós Zoltán (Hungary), Kos Ivan (Slovenia), Kuralt Zan (Slovenia), László Danyi (Hungary), Lindner Norman (Germany), Martínez Muñoz Carlos (Finland), Mesibov Robert (Australia), Minelli Alessandro (Italy), Moritz Leif (Germany), Mwabvu Taro (South Africa), Oeyen Jan Philip (Germany), Peretti Emiliano (Italy), Pimvichai Piyatida (Thailand), Read Helen (United Kingdom), Reip Hans (Germany), Rosenberg Jörg (Germany), Ruhberg Hilke (Germany), Semenyuk Irina (Russia-Vietnam), Short Megan (Australia), Simaiakis Stylianos (Greece), Snyder Bruce (USA), Sombke Andy (Austria), Stoev Pavel (Bulgaria), Tajovský Karel (Czech Republic), Tuf Ivan (Czech Republic), Vagalinski Boyan (Bulgaria), Vahtera Varpu (Finland), Voigtländer Karin (Germany), Vuji Vukica (Serbia), Wesener Thomas (Germany)

The number of the CIM members participating to the GA is large enough to make it valid.

1. Opening Words by the President Greg Edgecombe

The GA is opened by the President Greg Edgecombe (CIM President 2011-2019) according to the 18ICM Agenda. President's moral report will be published in the CIM Newsletter and posted to the CIM Website, in order to be distributed to every CIM member.

Moral Report

By Greg Edgecombe, President of the CIM (2011-2019)

Thank you all for attending 18ICM, contributing talks and posters, and for participating in the General Assembly this afternoon.

These congresses are a core function of the CIM, and we are grateful to colleagues who offer to host us. Here in Budapest, Zoltán, Elisabeth and their team have made a great contribution to the CIM by hosting this outstanding congress. On behalf of the Executive Committee of the CIM, I extend our thanks to our hosts this week for giving us this chance to meet and share our science, and for introducing us to Budapest. Please raise a glass to our Hungarian friends this evening at the closing dinner.

In the two years since 17ICM in Krabi, several leaving myriapodologists have passed away, among them some of the founding Members of the CIM. I speak of course of Jean-Marie Demange, Wolfram Dunger, Otto Kraus, Stefan Negrea, and Rowland Shelley. We wish to acknowledge their contributions to our science through their distinguished careers, and to those of us who knew them personally, to honour their memory as colleagues, as mentors, and as friends.

I wish to thank my colleagues on the CIM Executive Committee for their contributions since our last congress and over the years before that. Our General-Secretary Stelios Simaiakis has steered the Newsletter since its inception three years ago. Our Treasurer Hans Reip has tenaciously found solutions to problems that stemmed from moving our bank account between countries and ensured we have an income stream again. Webmaster Peter Decker has contributed greatly to the modernization of the CIM via the website and, now, the Literature Management system that he'll present to us this afternoon. Reinventing ourselves after shifting from our base in Paris has not always been easy, but the advice and assistance of Associate-Secretary Jean-Jacques Geoffroy has aided our transition.

Council will have considerable turnover at the end of this General Assembly, as those of us who were in the "Class of 2011" have now reached the end of our third term and are ineligible for re-election. I'd like to thank these Councillors – Julián Bueno-Villegas, Bruce Snyder, Ivan Tuf, Karin Voigtländer, and Thomas Wesener – for help at many different times over the past eight years.

Although our team's makeup is changing, we are in a strong position because a dedicated and talented group of myriapodologists have signalled their willingness to serve on Council for the 2019-2021 term. Following our statutes, we will vote on their membership in Council this afternoon. Bruce and I also end eight years as President and Vice President, respectively, this afternoon. Again, we are fortunate to have outstanding candidates among our likely new Council.

The GA formally votes on this report (Against = 0 / Abstention = 0).
The President's moral report is unanimously adopted.

2. Activity report by the General Secretary Stylianos Simaiakis

The General Secretary introduces the GA by summarizing the present situation and comments on the important decisions CIM members have to consider for the present and future of the CIM. This does not need any formal vote.

Activity Report By Stylianos Simaiakis, General Secretary of the CIM

Almost 50 years since the creation of the CIM in 1968 (during the 1st ICM in Paris, France), 20 years since the formal constitution of the CIM as an International Society with a Council, Board and Statutes in 1999 (during the 11th ICM in Białowieża, Poland), and, 17 years after the

constitution of the CIM Council and executive Committee in 2002 (during the 12th ICM in Mtunzini, South Africa), it is again time to consider the future of our Society.

Many important and decisive questions (e.g. synthesis of the CIM Council, CIM Treasury, CIM Website, CIM Bibliodatabase, future Congresses) need to be managed by the CIM Society and Council during the upcoming 18th ICM in Budapest. With the following document, we wish to highlight themes for discussion as well as to facilitate your preparation for and interactions at the General Assembly in Budapest, during the 18th ICM, August 25-31, 2019.

3. Renewal of the Executive Committee, Council & Board (2019-2021)

THE FORMER EXECUTIVE COMMITTEE (2017-2019) CONSISTED OF 12 CIM MEMBERS

President (elected): Greg Edgecombe
Vice-President (elected): Bruce A. Snyder
General-Secretary (appointed): Stylianos Simaiakis
Associate-Secretary (appointed): Jean-Jacques Geoffroy
General-Treasurer (appointed): Hans Reip

COUNCILORS

Councilor (elected): Nesrine Akkari
Councilor (elected): Julian Bueno-Villegas
Councilor (elected): Peter Decker
Councilor (elected): Piyatida Pimvichai
Councilor (elected): Ivan Hadrián Tuf
Councilor (elected): Karin Voigtländer
Councilor (elected): Thomas Wesener

On 24 July 2019, CIM Secretariat received 10 (ten) candidates to join the new CIM Council 2019-2021.

3 re-eligible Councilors:

Nesrine Akkari (Austria)
Peter Decker (Germany)
Piyatida Pimvichai (Thailand)

7 new nominees:

Dragan Antic (Serbia)
Lucio Bonato (Italy)
Amazonas Chagas (Brazil)
László Dányi (Hungary)
Carsten Müller (Germany)
Petra Sierwald (USA)
Varpu Vahtera (Finland)

The GA formally votes on this list (Against = 0 / Abstention = 0).

Ten (10) CIM members of the **CIM Council** were unanimously elected for CIM Council 2019-2021 by the GA 2019 in Budapest, Hungary (7 new Nominees and 3 re-eligible Councilors).

The General-Secretary, the Associate-Secretary and the Treasurer have been appointed for 2019-2021 in Budapest, Hungary.

The President and Vice-President are elected by the New Executive Committee

THE NEW EXECUTIVE COMMITTEE (2019-2021) CONSISTED OF 13 CIM MEMBERS

President (elected): Peter Decker (Germany)
 Vice-President (elected): Nesrine Akkari (Tunisia)
 General-Secretary (appointed): Stylianos Simaiakis (Greece)
 Associate-Secretary (appointed): Jean-Jacques Geoffroy (France)
 General-Treasurer (appointed): Hans Reip (Germany)

COUNCILORS

Councilor (elected): Dragan Antic (Serbia)
 Councilor (elected): Lucio Bonato (Italy)
 Councilor (elected): Amazonas Chagas-Junior (Brazil)
 Councilor (elected): László Dányi (Hungary)
 Councilor (elected): Carsten Müller (Germany)
 Councilor (elected): Piyatida Pimvichai (Thailand)
 Councilor (elected): Petra Sierwald (USA)
 Councilor (elected): Varpu Vahtera (Finland)

Based on the former decision of the CIM Council to move to a two year periodicity between two successive Congresses, the time-table for renewal of the CIM Council is the following.

Nesrine Akkari (Austria)	elected2014	reeligible2017	reeligible2019	NONreeligible2021
Peter Decker (Germany)	elected 2017	reeligible2019	reeligible2021	NONreeligible2023
Piyatida Pimvichai (Thailand)	elected 2017	reeligible2019	reeligible2021	NONreeligible2023
Dragan Antic (Serbia)	elected2019	reelected2021	reeligible2023	NONreeligible2025
Lucio Bonato (Italy)	elected2019	reelected2021	reeligible2023	NONreeligible2025
Amazonas Chagas (Brazil)	elected2019	reelected2021	reeligible2023	NONreeligible2025
László Dányi (Hungary)	elected2019	reelected2021	reeligible2023	NONreeligible2025
Carsten Müller (Germany)	elected2019	reelected2021	reeligible2023	NONreeligible2025
Petra Sierwald (USA)	elected2019	reelected2021	reeligible2023	NONreeligible2025
Varpu Vahtera (Finland)	elected2019	reelected2021	reeligible2023	NONreeligible2025

Stylianos Simaiakis (Greece)	General Secretary (appointed)
Jean-Jacques Geoffroy (France)	Associate Secretary (appointed)
Hans Reip (Germany)	Treasurer (appointed)

4. Financial Report by the Treasurer Hans Reip

Dear colleagues, collaborators, and friends,

after one exciting congress in Budapest, I would like to remind everybody who has not yet paid the current membership fee to do it before the end of this year.

The current fees are:

- 30 € for professionals
- 10 € for students (including Ph.D. students).

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 in 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.

Hans Reip
Treasurer

Financial Report
By Hans Reip, Treasurer of the CIM

BALANCE - CIM-Accounts				
status of		31.12.2017	31.12.2018	30.08.2019
Postbank		4.529 €	4.772 €	4.772 €
DKB			180 €	1.258 €
PayPal				849 €
Cash				1.182 €
			SUM	8.061 €

Notes:

1. We still face problems in getting access to the old Postbank account in Paris. For unknown reason the internet access is blocked for me and for Jean-Jacques Geoffroy
2. The Cash money is transferred to the DKB-bank account, meanwhile.
3. The PayPal money is transferred to the DKB-bank account, meanwhile.

Statistics of Payments for membership fees

Total Payments and Methods (until 30.08.2019)	
No. of Persons	
DKB	18
Paypal	15
Cash	15
Payed	52
Listed Member (current)	173
Not yet payed	121
	70%

Status of payers		Paymens for year	
Students	7	2018	38
Full	45	2019	49
<i>Honorary</i>	13	2020	30

Plan for 2019 / 2020

Planned/open Payments as of 30.08.2019	
Website Domain 2014-2020	140 €
CIM LIT Programming 2019	3.500 €
Website Design, CSS-programming 2020?	2.000 €
Presents for ICM18-staff	150 €
Poster award, fee for next congress	400 €
SUM	6.190 €

Note: The first payment rate for the CIM-LIT-programming was payed at the 09.09.2019. The second rate must be paid in December 2019.

The GA formally votes on this report (Against = 0 / Abstention = 0).
The Treasurer's report is unanimously adopted.

5. New candidates for membership

During the 18ICM in Budapest, General-Secretary received 13 new candidates:

1. Luka LUČIĆ (Serbia) proposed by Greg Edgecombe
2. Dalibor STOJANOVIC (Serbia) proposed by Dragan Antic
3. Giorgi NEBIERIDZEN (Georgia) proposed by Dragan Antic
4. Tvrtko DRAZINA (Croatia) proposed by Stylianos Simaiakis
5. Luisa Fernanda Vasquez VALVERDE (Colombia) proposed by Paul Marek
6. Pooja ANILKUMAR (India) proposed by Thomas Wesener
7. Emiliano PERETTI (Italy) proposed by Stylianos Simaiakis
8. Victor CALVANESE (Brazil) proposed by Stylianos Simaiakis
9. Margret ECKHARD (Germany) proposed by Peter Decker
10. Zan KURALT (Slovenia) proposed by Ivan Kos
11. Manoela KARAM-GEMAEL (Brazil) proposed by Amazonas Chagas-Jr.
12. Carolina ROJAS BUFFET (Uruguay) proposed by Stylianos Simaiakis
13. Sebastián Galvis JIMÉNEZ (Colombia) proposed by Julián Bueno-Villegas

All candidates are accepted by the GA as active CIM members.

6. 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 eliminate knowledge of new papers. Thus the list of publications constituted the largest part of the annual CIM Bulletin. The CIM LIT 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 (cms.myriapodology.org) contains about 16.500 references and based on the literature collection of the Senckenberg Museum of Natural and History Görlitz (ca. 8.000 references) and the MyriaLit database of Reip et al. (ca. 8.000 references). This tool will replace the Questionnaire that was used until 2013. 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 send 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. Please check MyriaLit before entering a reference to avoid duplicates. For many entries (e.g. person, journals) you can choose from a large predefined list. Only if the person or journal is not available in the list press the button "Create a new". Please fill out as many fields you can, at least those marked with an asterisk*. If you finished please press "OK". After creating a reference citation, you can go to "Edit own literature" to edit or delete your entry. All input literature will be verified by a CIM editor and will be sending to the CIM LIT database, which is also connected to the online soil-zoological data warehouse [Edaphobase](#) (Senckenberg Museum of Natural History Görlitz), when accepted.

Please understand that it may take a few days until your entries are validated.

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.

7. Proceedings of the 18ICM Congress, Budapest 2019

The proceedings of the 18ICM will be published in a special issue of *ZooKeys*.

Pavel Stoev explains how the proceedings could be published by Pensoft in *ZooKeys*, reminding that the previous proceedings of our congresses in Brisbane 2011, Olomouc 2014 and Krabi 2017 have already been published in *ZooKeys*.

There will be an evaluation of the manuscripts by the editorial committee.

A proposal for a deadline to submit manuscripts will be given by Dr Zoltán Korsós and the organizing committee of the 18ICM.

8. 19th International Congress of Myriapodology, 2021

A proposal to host the next Myriapodological Congress in Colombia was officially received and discussed. On behalf of Professor Eduardo Florez, Sebastian Galvis (member of the Myriapodological Group of Colombia) with the support of Julián Bueno-Villegas, presented a proposal to host the 19ICM in Colombia in August 2021. Below you may find the official invitation letter.

Bogotá, Colombia, August 15, 2019

DR. GREGORY EDGECOMBE
PRESIDENT OF THE INTERNATIONAL SOCIETY OF MYRIAPODOLOGY

DR. ZOLTÁN KORSÓS
CHAIR OF THE 18TH INTERNATIONAL CONGRESS OF MYRIAPODOLOGY

Dear Dr. Edgecombe and Dr. Korsós, in the name of the Colombian Group of Myriapodology (GCM), receive our warmest regards and our best wishes of success in the holding of the 18th International Congress of Myriapodology.

We are writing to you in order to express our desire to hold the next edition of the International Congress of Myriapodology, 2021 in Colombia.

We are a group of 12 people that include professional researchers and undergraduate and graduate students, who, over the course of a decade, have been carrying out several activities relating to the study of Myriapodology that include conducting several research projects, the publication of articles on the centipede and millipede fauna of Colombia and the planning of national and international scientific events (1st Course in Neotropical Myriapodology, Bogotá, 2015; International Workshop on Arthropod Phylogeny and Conservation, Bogotá, 2016 and the 1st Neotropical Symposium of Myriapodology, Bogotá, 2018); we consider that we are currently able to undertake the organization of the most important event in this discipline worldwide.

For Neotropical and Latin American Myriapodology, being able to carry out the 19th Congress of Myriapodology in Colombia would be the most important contribution to promote the development of this science in the region.

We appreciate the time that will be provided for the presentation of our proposal, by one of the members of the GCM, Mr. Sebastian Galvis, with the support of our Mexican colleague Julián Bueno-Villegas, and we hope to be selected as the venue of the next edition of the congress. We would be glad to serve as your hosts in a mega-diverse country that has a vast myriapodological diversity that is still waiting to be discovered.

Yours truly

DANIELA MARTÍNEZ T.
PRESIDENT

EDUARDO FLÓREZ D.
SECRETARY

GRUPO COLOMBIANO DE MIRIAPODOLOGIA

The GA votes and decides to accept the proposal.

9. Future Myriapodological Congresses

Dragan Z. Antic confirmed that there is a strong possibility for a myriapodological congress in Belgrade, SERBIA, in 2023. Furthermore, a possibility appears to have the following ICM in the USA (Bruce Snyder) in 2025.

10. Closure of the General Assembly

The GA ends and the General Secretary asks members of the new Council to meet immediately.

Stylianios Simaiakis, CIM General-Secretary



Honorary members

Professor & Curator Henrik Enghoff became an Honorary Member of the CIM Society at 18ICM (2019).



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 MAURIES (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).

It is reminded the three minimum conditions needed to be named an honorary member of the CIM : 1- To be alive ; 2- to be completely retired from a teaching, research or official curatorial position ; 3- to have given valuable contribution to the CIM Society and/or myriapodology during the active period.

Student Poster Award, 18ICM Budapest, Hungary, August 2019

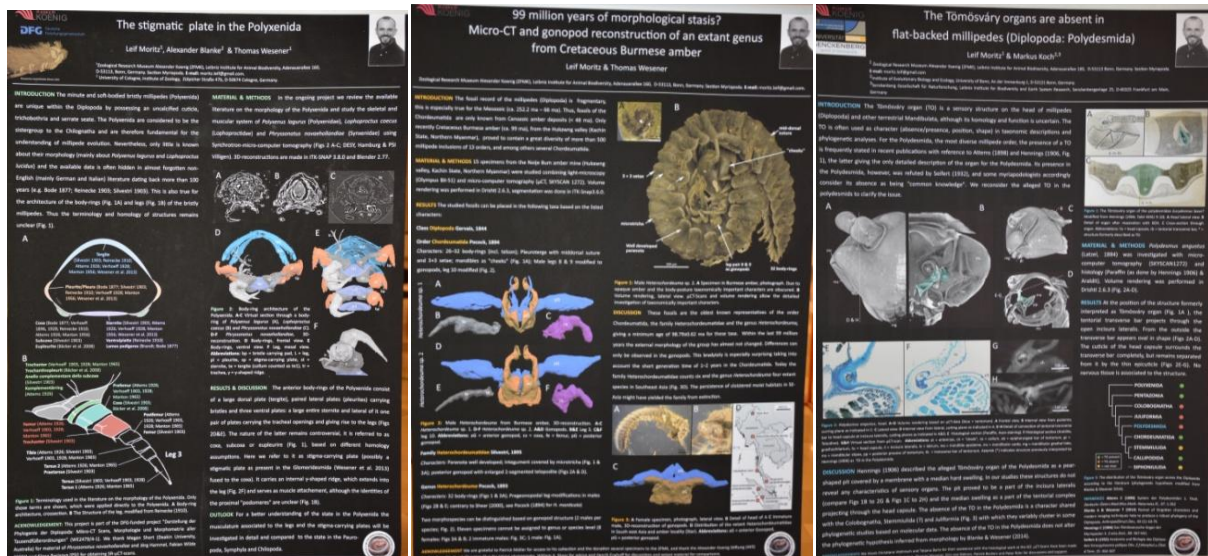
Leif Moritz - Zoological Research Museum Alexander Koenig (Germany)



Leif Moritz presents a teamwork at the 18th ICM.

During the farewell party of the 18th International Congress of Myriapodology in Budapest (Hungary), Leif Moritz received the award for the Best Student Poster. Leif Moritz presented four exceptional posters entitled:

1. “The stigmatic plate in the Polyxenida” Leif MORITZ & Thomas WESENER
2. “99 million years of morphological stasis? Micro-CT and gonopod reconstruction of an extant genus from Cretaceous Burmese amber” Leif MORITZ & Thomas WESENER
3. “Tömösváry organs are absent in flat-backed millipedes (Diplopoda: Polydesmida)” Leif MORITZ & Marcus KOCH
4. “Leg morphology and muscle systems in millipedes investigated utilizing synchrotron micro-CT (Myriapoda, Diplopoda)” Tim DANNENFEL, Benjamin WIPFLER, Thomas WESENER, Jörg HAMMEL & Leif MORITZ



Obituary (Professor Dr. Otto Kraus 1930–2017)

By Peter Decker, Peter Jäger, Petra Sierwald & Rüdiger Bieler



Prof. Dr. Otto Kraus, scientist and university lecturer, died on 24 October 2017 in Hamburg at the age of 87. Prof. Kraus was born in Frankfurt am Main on 17 May 1930. From 1950 to 1955 he studied zoology, botany, geology/palaeontology and geography at the Johann Wolfgang Goethe University in Frankfurt. At the same time, he was already working as a volunteer at the Senckenberg Research Institute in the zoological department, where his dissertation was written in 1955 under the guidance of Robert Mertens, the director at that time. The dissertation dealt with Myriapoda and Araneae from El Salvador, two animal groups that, along with other Arachnida, were to accompany his scientific work for most of his career. In 1965, Kraus wrote his habilitation treatise on the Odontopygoidea, a superfamily of diplopods and – ground-breaking - discussed the homology concepts for the individual components of gonopods.

In 1969, Prof. Otto Kraus accepted a call for a professorship at the University of Hamburg. Among the many zoological courses that he taught there over the decades, it was above all the "General Zoology", extremely popular with students, with which he inspired generations of future biologists. As mentor and doctoral supervisor of numerous students, not only his own enthusiasm for zoological diversity and evolutionary biology, but also his strong focus on the subtleties of comparative and functional morphology, the importance of museum collections, nomenclatural guidelines and visual presentation methods from technical drawing to macrophotography, transferred to the next generation of zoological researchers.

In the 1950s to 70s Prof. Otto Kraus shaped the field of myriapodology in Germany. During the first International Myriapodological Congress in Paris in 1968 he was co-founder of the Centre International de Myriapodologie. Today the Society has almost 200 members and still promotes the worldwide exchange of myriapodologists. In 1975 he hosted the 3rd International Congress of Myriapodology in Hamburg and thereby drew attention to this animal group especially in Germany.

With his numerous taxonomic and faunistic works he created an important basis for the knowledge of biodiversity and distribution of the diplopods and chilopods of Peru and El Salvador. In addition to the neotropic myriapods, the Central and East African myriapods also aroused his interest. His monograph on the Afrotropical Odontopygoidea from 1966 is still today the most comprehensive compendium for this group of animals. In the 1990s and 2000s, Prof. Otto Kraus was mainly concerned with the relationship between the Myriapoda and the insects as well as the Palaeozoic giant arthropods, the Arthropleurida. In addition to taxonomy, biogeography and phylogeography have always been important elements of his work.

The work of Prof. Otto Kraus comprises many facets, as many as it is rare today in a time of specialization. Half of his approximately 200 publications dealt with the morphology and systematics of various groups of arachnids and myriapods (several of them together with his wife, Dr. Margarete Kraus). He described many new taxa including from the Araneae (85): 2 genera, 83 species, the Diplopoda (531): 45 genera, 467 species, 19 subspecies, the Chilopoda (27): 1 genus, 26 species, and the Gastropoda (3): 1 subgenus, 2 species. The majority of the material he worked on and described is now in the collections of the Senckenberg Research Institute and Nature Museum in Frankfurt. As befits a systematic zoologist, taxa were also named after him, e.g. 7 species of Diplopoda, 4 species of Chilopoda and 7 species of spiders.

Thus we will always be reminded of Prof. Otto Kraus as a great zoologist and systematist, as an advocate of detail and the big picture!

Obituary (Professor Wolfram Dunger 1929–2019)

By Karin Voigtländer & Ulrich Burkhardt

With great sadness we announce the death of Professor Wolfram Dunger, on 24th January 2019, aged 89. We will remember him as an outstanding soil zoologist and one of the most influential researchers on the biology of Collembola, Myriapoda, Lumbricidae and other soil invertebrates. Sixty years of scientific work in the fields of soil zoology, taxonomy, ecology and museology earned him wide national and international recognition.

The name Dunger is inseparably linked to the history of soil zoology in Germany and German-speaking countries. His research on decomposition of litter by soil organisms was some of the earliest in the world on this subject and attracted the attention of many soil biologists. His long-term research—of more than 50 years—on immigration and succession of soil-animal communities on recultivated dumps of open-cast lignite mines was the world's first in this form and made both Dunger and his museum well known within the international scientific community.

After his doctorate at the University of Leipzig, Dunger was denied a classical academic career at the university for political reasons. Instead, in 1959 he was appointed director of a small museum on the easternmost edge of the GDR, the State (today: Senckenberg) Museum of Natural History Görlitz, directly under the control of the State Secretariat for Higher Education. In a wise and prudent way he succeeded in maintaining the museum in this position, with the vital influence possibilities resulting from it for the museum, over the subsequent 50 years.

Following his own research interests, Wolfram Dunger introduced soil zoology as the museum's future research focus. Mainly thanks to his efforts, the small provincial museum developed into an international centre of excellence for soil zoology, which is unique among German natural history museums. Under his directorship he raised the number of curators from 2 to 17; thanks to his personality and vision, he succeeded in gathering numerous talented young scientists, and fostering their development into taxonomic experts for their respective taxa. A substantial number of scientific projects initiated by Dunger provided the basis for the expansion of the museum's research capacities.

Besides his research on soil zoology and ecology, Dunger also achieved worldwide recognition as an expert on Collembola. He initiated the publication of a large-scale critical review of current knowledge about the systematics, ecology, distribution and applied ecology of all Palaearctic Collembola species. These "Synopses on Palaearctic Collembola", written by top experts, and including two volumes by himself, are known worldwide as "Dunger's blue books", providing a comprehensive overview of this important group of soil organisms. Extensive revisions of difficult groups of Collembola were carried out by Dunger, and 30 taxa new to science were described by him.

For Dunger, research was inextricably linked to collections, that is, the organismic documentation of research results, since he regarded collections not only as taxonomic references, but also as an archive of the soil and its inhabitants in space and time. He understood and developed the collections of soil animals as an indispensable pillar of his museum research, the quality of which was closely linked to the taxonomic expertise of the curators. For this, Dunger developed, from 1960 on, the basis for a system of complex sampling techniques still used today, which combines information on physico-chemical site properties, soil types, land use, vegetation and habitat, collection and sorting methods, as well as numerous other parameters. A log number, which links the sampling to each determined species, makes it possible to derive correlations between habitat and the soil-fauna biocoenosis. Today, these log numbers are registered as "Dunger Numbers" (DNR) and thus continue as a permanent token in his honour. This principle of relating a sample to the data associated with it formed the basis for the development of the ecological and taxonomic database "Edaphobase" and its evaluation tools (www.edaphobase.org)

Dunger was not a "museum man" born of need but out of passion. He published intensively on the tasks of a research museum; the two most important among these he considered the preservation of natural resources and the education of the population, particularly about the environment. With great commitment he dedicated himself to the development of exhibitions, the organisation of lecture series and educational courses for the public, teacher training, and much more. It was not until 1992 that he was able to fulfil his great dream with the conception and development of the travelling exhibition "Leben im Boden" (in close cooperation with Dr K. Voigtländer), which opened in Görlitz in September 1995 as part of the international symposium "Importance, Situation, and Development of Systematics in Soil Zoology" and which subsequently was presented in German and international museums throughout Europe.

In addition to his research in soil zoology and taxonomy and his museum activities, Dunger also saw himself responsible for promoting regional natural science research in the local region, Upper Lusatia, following the prohibition of the "Naturforschende Gesellschaft zu Görlitz" after World War II. From 1961 on, he organized regular "Symposia on Scientific Research in Upper Lusatia" at the Museum, the results of which were published in the "Abhandlungen und Berichte des Naturkundemuseums Görlitz" (today "Soil Organisms"). From 1990 to 2007 he was the chairman (later honorary chairman) of the "Naturforschende Gesellschaft der Oberlausitz", newly founded under his initiative in the tradition of the old society.

His second passion after springtails was myriapods. Besides being the subject of smaller taxonomic and faunistic studies, they were an integral part of all his large projects on community ecology. Dunger was one of the first members of the "Centre international de myriapodologie" (CIM, Paris), founded in 1968, and was in close correspondence with many of its members. For political reasons, he was not allowed to take part in conferences or in other

personal activities within the society; it was only in 1989 that he was permitted, for the first time and with great difficulties, to attend the 7th International Congress of Myriapodology in Vittorio Veneto. Dunger was very impressed by the activities of the British Myriapod Group (later British Myriapod and Isopod Group). Based on the British model he was significantly involved in an advisory role in founding the Arbeitsgemeinschaft der Deutschsprachigen Myriapodologen [Working Group of German-speaking Myriapodologists] and its journal "Schubartiana" in 2004. Long before the "Red Lists" became the focus of political attention, Dunger called for special protection of soil animals. This inspired the initiation of the project "Red Lists" in the Section Myriapoda of the Görlitz museum, which led to the Saxony-Anhalt red lists for diplopods and chilopods, published in 2004 and continued in 2019, as well as the nationwide Red Lists (2016) for these taxa.

Dunger was not only an active author, publishing about 230 original articles, reviews, textbook contributions and monographs, but also acted for 40 years as chief editor of the "Abhandlungen und Berichte des Naturkundemuseums Görlitz" (today "Soil Organisms"), and for almost 20 years as editor of the "Berichte der Naturforschenden Gesellschaft der Oberlausitz". His popular scientific books "Unbekanntes Leben im Boden" ("Unknown life in soil") and especially "Tiere im Boden" ("Animals in soil") fascinated many prospective scientists and inspired them to dedicate themselves more closely to life in soil.

Wolfram Dunger was able to gain insights into soil zoology on the basis of a broad knowledge of various animal groups, decades of extensive field work and precise knowledge of the literature. This led to a new understanding of life in the soil. His visionary work, his specialist knowledge and his outstanding personality have made the Görlitz research museum what it is today.

A detailed account of Wolfram Dunger's life and work is given by Voigtländer & Burkhardt in Schubartiana ([Link setzen](#)). A complete list of his publications can be found in Klausnitzer (2010) ([Link setzen](#)).

Obituary (Stefan Negrea 1930–2019)

By Mihaela Ion

Stefan Negrea was a leading taxonomist and biospeleologist in Romania, working most of his career as a researcher at the "Emil Racovita" Institute of Speleology and leading the biospeleology department prior to his retirement. Alongside the other participants at the First International Congress of Myriapodology (Paris, France, 1968), Stefan Negrea was a contributor to the creation of CIM.

During his activity, he described 30 centipede species and subspecies, from Romania, Cuba, Spain and Israel, but he never abandoned cladocerans. Together with his wife Alexandrina Negrea (23 August 1930- 2 May 2011), he visited and researched over 200 caves in Romania, publishing not only taxonomy papers but also studies in the domains of speleology, ecology and zoogeography.

Many myriapodologists recall talking with him at various congresses and he remained very active even when he could no longer travel, willing to dive into the biology world, so he attended zoology congresses in Bucharest, his home town. His rich library is now a great support for biologist from the Institute of Speleology.

Obituary (Dr. Walter Hüther 1932–2019)

By Peter Decker

Walter Hüther, member of the International Society for Myriapodology, scientist and university lecturer, died on 11 May 2019 at the age of 87 in Bochum, Germany.

Hüther was interested in Pauropoda, Symphyla, Collembola and Entomology. He studied and received his doctorate at the Zoological Institute at the University of Mainz on the ecology of springtails, pauropods and mites in vineyards of the Palatinate.

At the beginning of the 70's he came to the Department of Biology at the University Bochum and taught there until his retirement. He built up the Entomological Collections there and with patience was able to bring the diversity of the arthropods closer to the students in lectures and excursions.

He was inspired by Prof. Friedrich Schaller to study pauropods and was in exchange with other colleagues such as Paul Remy. In 1972 he took part in the Second International Congress of

Myriapodology in Manchester and presented his work on the ecology of pauropods, one of the extremely few contributions to this group of animals at the CIM Congresses.

Publications of Walter Hütner for Myriapoda

- 1959. Zur Ernährung der Pauropoden. - Die Naturwissenschaften 46 (19): 563-564.
- 1971. Zwei interessante Pauropoden aus dem Oberrheingebiet. - Mitteilungen der Pollichia, Reihe III 18: 170-177.
- 1974. Zur Bionomie mitteleuropäischer Pauropoden. - Symposia of the Zoological Society of London 32: 411-421.
- 1975. Ein neuer *Decapauropus* aus der Pfalz. - Revue d'Ecologie et de biologie du sol 12 (2) : 487-491.
- 1982. Symphylen und Pauropoden des Bausenbergs. - Decheniana, Beihefte 27: 56-75
- 1985. Verbreitung und Vorkommen einiger Pauropodenarten im Brasilianischen Amazonas-Gebiet. - In: Ellis WN, Jeekel CAW & Pieters FFJM (ed.) Proceedings of the 6th International Congress of Myriapodology. Amsterdam, 12-17 April 1984. - Contributions to Zoology 55 (1): 95-99.
- & Kinkler H 2013. Zwei wenig bekannte Gruppen der Tausendfüßer, „Wenigfüßer“ und „Zwergfüßer“ des Naturschutzgebiets Gronenborner Teiche in Leverkusen (Myriapoda: Pauropoda, Symphyla). - Decheniana 166: 51-54.

Proposal of Myriatrix, a virtual research environment for the International Society for Myriapodology

By Carlos A. Martínez-Muñoz

The Centre International de Myriapodologie / International Society for Myriapodology (CIM) currently represents the global community of myriapodologists, scientists working on the many-legged terrestrial invertebrate groups Myriapoda & Onychophora. Several online resources that aid research on Myriapoda are currently available. The most remarkable of those resources include the MyriaLit / CIM LIT database (<https://myriapodology.org/myrlit/>), the Onychophora Website (<http://onychophora.com>), ChiloBase 2.0 (<http://chilobase.biologia.unipd.it>) and MilliBase (<http://www.millibase.org>).

Although multiauthored, only two of those online resources are collaborative in the virtual sense: 1) MilliBase, which is based on the Aphia platform and enables multiple taxonomic and thematic editors to enter and update information and 2) MyriaLit /CIM LIT, with its Online Myriapod Literature Reference Input Tool from the Centre International de Myriapodologie (<http://cms.myriapodology.org/index.php>), which launched in August 2019, thus allowing CIM members to add literature to the MyriaLit /CIM LIT. Of all four resources, only the MyriaLit / CIM LIT is explicitly ascribed to the CIM.

While the MilliBase covers Diplopoda, Symphyla and Pauropoda, the current panorama leaves the Onychophora and Chilopoda specialists without an online environment where taxonomic backbones of their respective groups could be collaboratively curated. The inclusion of fossil taxa across online resources is also uneven: fossil Onychophora are included in the Onychophora Website, while the MilliBase and the ChiloBase 2.0 do not include fossils. Those can be in turn accessed from Fossilworks (<http://fossilworks.org/>), the gateway to the Paleobiology Database. None of the databases includes genetic data and regarding conservation, only the Onychophora website includes links to IUCN assessments. At the moment, the Aphia platform, the most advanced of all the platforms in use for Myriapodology, has no tools to aggregate genetic and conservation information.

Over the years, duplicated and sometimes triplicated literature curation and standardization across databases was one of the most recurrent and time-consuming issues that I faced. Sending fixes to ChiloBase seemed also a duplicated time-burden regarding the time spent writing emails on one side and the time spent reading and understanding emails on the other side. However, those are just two minor aspects of a bigger problem: the need for an expedite, collaborative online research environment that could cover most aspects of myriapodological research (taxonomy, morphology, ecology, genetics, conservation) together with supporting literature, keys, media and forums, across all taxonomic groups, living and extant.

The platform supporting those functions already exists. It is called Scratchpads, an online virtual research environment for biodiversity, allowing anyone to share data and create research networks. Scratchpads is aligned with the ideals of the Open Science revolution, as it is built on the Open Source content management system Drupal. This means that, unlike other platforms, Scratchpads can be freely recoded and improved to suit the needs of the taxonomic community. Back in 2016, I travelled to Sweden to take a course on Scratchpads and I was most pleased with the potential of the platform.

In a nutshell, Scratchpads allows the creation of a custom taxonomic backbone, which can be built by means of manual entry of taxa and/or by importing pre-existing classifications. The classification is then used for all sorts of data aggregation, a process that occurs automatically and that is dynamic. Literature data can be aggregated from the Biodiversity Heritage Library, genetic data from NCBI Genbank and species conservation assessments from the IUCN Red List of Threatened Species. The platform also has a literature module, which allows import, creation and editing of references. Regarding morphology, Scratchpads allows the creation of vocabularies with morphological terms, which can then be used on standardized taxon descriptions. Taxon descriptions and even specimen datasets can be imported, it is possible to create keys and there is a publication module which allows integration with Pensoft's ARPHA Writing Tool. The platform is extensively documented online and it has training materials available.

Some time ago, I assembled a Myriatrix, a virtual research environment for Myriapoda and Onychophora. The site is hosted at the Natural History Museum London, and it has no cost for the users. It can be reached at <http://myriatrix.myspecies.info/>. The core of the Myriatrix lies at <http://myriatrix.myspecies.info/myriatrix/myriapoda>, the page that contains the taxonomic backbone. I left the Myriatrix at the demo stage, as it had no meaning to add static content at that time and just for myself. The dynamic content, on the other hand, is operative, including genetic (e. g. <http://myriatrix.myspecies.info/taxonomy/term/6460/descriptions>) and conservation data (e. g. <http://myriatrix.myspecies.info/taxonomy/term/9019/descriptions>). At the recently celebrated 18th International Congress of Myriapodology, I offered the Myriatrix as the possible solution for the International Society of Myriapodology to accommodate the online collaboration needs of its members and of the broader community of myriapodologists. Myriatrix would allow data creation, editing and sharing across our taxa and fields of interest. The platform represents the possibility of delivering a consolidated taxonomic backbone from a trusted source, the CIM itself. Being adopted by and ascribed to the CIM, governance of the platform could be implemented from the CIM Council and Board.

I am most optimistic that this proposal will be exciting, not only to the CIM Council but to many of our many members who desire a venue for virtual collaboration.

99-million-year-old millipede discovered in Burmese amber

A 3D reconstruction of the fossil allowed for the description of an entirely new suborder

Summary:

An 8.2-millimetre fossil millipede was discovered in Burmese amber. Having used new-age 3D X-ray microscopy, a Bulgarian-German research team confirmed this is the first fossil millipede of the entire order. The new species, despite having lived alongside the Cretaceous megafauna, is smaller than any of the extant members of its group. Because of its extraordinary morphology, it is described as a new suborder. The study was published in the open-access journal *ZooKeys*.

Main text:

Even though we are led to believe that during the Cretaceous the Earth used to be an exclusive home for fearsome giants, including carnivorous velociraptors and arthropods larger than a modern adult human, it turns out that there was still room for harmless minute invertebrates measuring only several millimetres.

Such is the case of a tiny millipede of only 8.2 mm in length, recently found in 99-million-year-old amber in Myanmar. Using the latest research technologies, the scientists concluded that not only were they handling the first fossil millipede of the order (Callipodida) and also the smallest amongst its contemporary relatives, but that its morphology was so unusual that it drastically deviated from its contemporary relatives.

As a result, Prof. Pavel Stoev of the [National Museum of Natural History](#) (Bulgaria) together with his colleagues Dr. Thomas Wesener and Leif Moritz of the [Zoological Research Museum Alexander Koenig](#) (Germany) had to revise the current millipede classification and introduce a new suborder. To put it in perspective, there have only been a handful of millipede suborders erected in the last 50 years. The findings are published in the open-access journal [ZooKeys](#).

To analyse the species and confirm its novelty, the scientists used 3D X-ray microscopy to 'slice' through the Cretaceous specimen and look into tiny details of its anatomy, which would normally not be preserved in fossils. The identification of the millipede also presents the first clue about the age of the order Callipodida, suggesting that this millipede group evolved at least some 100 million years ago. A 3D model of the animal is also available in the research article.

Curiously, the studied arthropod was far from the only one discovered in this particular amber deposit. On the contrary, it was found amongst as many as 529 millipede specimens, yet it was the sole representative of its order. This is why the scientists named it *Burmanopetalum*

inexpectatum, where "inexpectatum" means "unexpected" in Latin, while the generic epithet (*Burmanopetalum*) refers to the country of discovery (Myanmar, formerly Burma).

Lead author Prof. Pavel Stoev says:

We were so lucky to find this specimen so well preserved in amber! With the next-generation micro-computer tomography (micro-CT) and the associated image rendering and processing software, we are now able to reconstruct the whole animal and observe the tiniest morphological traits which are rarely preserved in fossils. This makes us confident that we have successfully compared its morphology with those of the extant millipedes. It came as a great surprise to us that this animal cannot be placed in the current millipede classification. Even though their general appearance have remained unchanged in the last 100 million years, as our planet underwent dramatic changes several times in this period, some morphological traits in Callipodida lineage have evolved significantly.

Co-author Dr. Thomas Wesener adds:

"We are grateful to Patrick Müller, who let us study his private collection of animals found in Burmese amber and dated from the Age of Dinosaurs. His is the largest European and the third largest in the world collection of the kind. We had the opportunity to examine over 400 amber stones that contain millipedes. Many of them are now deposited at the Museum Koenig in Bonn, so that scientists from all over the world can study them. Additionally, in our paper, we provide a high-resolution computer-tomography images of the newly described millipede. They are made public through [MorphBank](#), which means anyone can now freely access and re-use our data without even leaving the desk."

Leading expert in the study of fossil arthropods [Dr. Greg Edgecombe](#) ([Natural History Museum, London](#)) comments:

"The entire Mesozoic Era - a span of 185 million years - has until now only been sampled for a dozen species of millipedes, but new findings from Burmese amber are rapidly changing the picture. In the past few years, nearly all of the 16 living orders of millipedes have been identified in this 99-million-year-old amber. The beautiful anatomical data presented by Stoev et al. show that Callipodida now join the club."

Original source:

Stoev P, Moritz L, Wesener T (2019) Dwarfs under dinosaur legs: a new millipede of the order Callipodida (Diplopoda) from Cretaceous amber of Burma. ZooKeys 841: 79–96. <https://doi.org/10.3897/zookeys.841.34991>

Scientists discover new millipede fossils in 100-million-year-old amber

(Bonn, 10.12.2018) Scientists at the Zoological Research Museum A. Koenig - Leibniz Institute for Animal Biodiversity (ZFMK) discovered more than 450 millipedes in 100-million-year-old Burmese amber. 13 of the 16 main groups of extant (now-living) millipedes could be identified in the amber with the help of micro-CT technology. For half of these groups the findings represent the oldest known fossils. Future studies of these amber millipedes will significantly contribute to our understanding of millipede evolution.

Since the success of the "Jurassic Park" movies it is generally known that insects from the Age of the Dinosaurs can be exceptionally well preserved in amber, which is fossilized tree resin. Especially diverse is the animal fauna preserved in Cretaceous amber from Myanmar (Burma) near the Chinese border. In this almost 100-million-year-old amber spectacular discoveries have been made in the last few years such as dinosaur feathers, a complete dinosaur tail, unknown groups of spiders, as well as several now extinct groups of insects.

Only three species of millipedes were previously known from Burmese amber. This has changed thanks to a study conducted by Thomas Wesener and his PhD student Leif Moritz at the ZFMK and published in the journal "Check List".

The researchers studied and determined more than 450 millipedes preserved in Burmese amber and found species belonging to 13 of the 16 now-living main orders. For half of these orders, the studied amber contains the oldest known fossils. For their analysis the scientists employed micro-CT scan technology. Micro-CT scan technology uses X-rays from all directions to create a 3-D image of the specimen that can be virtually removed from the amber and digitally examined.

The studied amber is mostly from private collections, including the largest European collection, which is held by Patrick Müller from Käßhofen. Many additional scientifically important specimens, probably thousands, are part of inaccessible private collections in China.

Over the next few years the discovered specimens will be carefully described and compared to extant species. This will make it possible to study the morphological changes that occurred in the last 100-million years, as well as to date important splits in the millipede Tree of Life. It is still unknown whether the local millipede diversity, e.g. in the southern Alps of Italy or on the island of Madagascar, is the result of evolutionary processes dating back 1, 10, or more than 100-million years.

The scientists have already observed that most of the Cretaceous millipedes found in the amber do not differ significantly from the living species found in Southeast Asia - an indication of the old age of the extant millipede lineages. The diversity of the different orders, however, seems to have changed drastically. For example, during the Age of the Dinosaurs the so-called Colobognatha were very common. These unusual millipedes have heads that are extended to suck-up liquid food. Today less than 500 of the more than 12,000 known extant millipede species are colobognaths. However, this could be an artifact of the former way of life of Colobognatha. For example, freshly hatched, eight-legged juveniles are found in the amber - an indication that the animals lived and reproduced in the resin-producing trees.

Even before the arachnids and insects, and far ahead of the first vertebrates, the leaf-litter eating millipedes were the first animals to leave their mark on land more than 400-million-years ago. These early millipedes differ quite strongly from the ones living today – they were often much larger and many had very large eyes. The larger species of *Arthropleura* millipedes, for example, were up to 2 meters (6.5 feet) long and 50-80 centimeters (2-3 feet) wide – the largest arthropods to ever crawl our planet. Why these giants went extinct while the 16 recent orders survived is still unknown, partly because only a handful of mostly badly preserved fossils were known from the whole Mesozoic era (252-66-million years ago). Although it was always suspected that the 16 main groups of extant millipedes must be very old, a fossil record that supported this suspicion was missing.



Figure 1: Photo: An especially well-preserved specimen of the Polyzoniida in Burmese amber from the Age of the Dinosaurs. A rare group with less than 100 known species, the Polyzoniida are especially diverse in Cretaceous amber.



Figure 2: A micro-CT scan of a 100-million-year old millipede preserved in amber. It is possible to remove the specimens digitally from the amber stone and study them from all sides and angles. See video animation below.

Contact: Dr. Thomas Wesener, Zoologisches Forschungsmuseum Alexander Koenig,
Adenauerallee 160, 53113 Bonn.
t.wesener@leibniz-zfmk.de

A myriapod song

By Dr. Petr Dolejš

Curator of Invertebrates Department of Zoology

NATIONAL MUSEUM - NATURAL HISTORY MUSEUM

Biologové oranžová modráček, věnuje Dolejš

Mnohonozky

(a) Biologové vážení, milé bioložky
to Vám je velké snažení lovit' mnohonozky.

(b1) Je třeba koukat se pod kmeny stromů, jež zhnulý.
kdo nemá oči své přivřený, snad najde svinuli.

(b2) Musíme prohledat očima každickou skulinu.
kdo dobře detailů si všimá, objeví júlunku.

(c) Chobotule oranžová - mnohonozek královna - která má své pastěři?
Pokud cheska se neschová a ulovím ji zrovna, velmi mě to potěší.

(a) -

(b3) Při sběru pomocí prosevu nesmí být skřepule.
Bude nám určitě do zpevu, když najdem' chlupule.

(b4) Ptáte se, když pořád nadávám, někoho drba-li.
já zlosti se sitem tu mávám, že nemám hřebul,

(c)

(a)

(Translation)

Millipedes

(a) Dear biologists, it's a great effort to collect millipedes.

(b1) It is necessary to seek under trunks of fallen trees. Who does not have his eyes closed, find a **pill-millipede**.

(b2) We must search in every crevice. Who notices well the details, find a **julid**.

(c) ***Polyzonium germanicum*** is the queen of millipedes. Where does she have her shelter? If she does not hide today and if I collect her, I will be very flattered.

(b3) When collecting by sieving, you have to act without scruples. We will surely be singing, if we find a **bristle-millipede**.

(b4) You ask me, why am I still swearing at somebody. I brandish by a sieve vigorously as I don't have a **chordeumatid**.

The (c) part is available also in Hungarian:

Narancssárga ezerlábú, soklábúak királynője, hol van a te hajlékod? Ha nem rejtőzöl még ma el, el is kaplak ottan, s boldog leszek nyomban.