

# #HYMATHON2022



**A 24 hour virtual symposium  
from the International Society of Hymenopterists**

**31 March - 1 April 2022**



# #Hymathon2022

## International Society of Hymenopterists virtual symposium



Organising Committee:

Natalie Dale-Skey, Jessica Awad, Erinn Fagan-Jeffries, Miles Zhang  
Taisuke Kawano  
ISH Executive Committee

- The symposium comprises three sessions (Americas - Australasia and East Asia - Europe, Middle East and Africa) across three time zones
- All start times are given both in GMT<sup>1</sup> (between brackets) and in the local time zone of the moderator of the session (in bold)
- Titles of talks with the name of the presenter only and Twitter handles when available are listed in the first part of the program; abstracts and full authorship + affiliations are listed in the second part of the program
- Zoom links to attend the sessions will be sent out to registrants shortly before the symposium (the symposium is free to ISH members but registration is essential)
- The three winning entries of the photo competition figure in this program - in addition there will be an audience vote during #Hymathon2022; all entries can be seen at [Hymathon2022 Photo competition entries](#)

Cover photo: *Aglaotilla submetallescens* (Turner), Mutillidae, from Brisbane, Australia.

Photograph by Denis Brothers

The photos were taken and processed as follows: Canon Powershot G10 digital camera adapted to Wild M400 microscope using a Clearshot 600 adapter kit (Alexis Scientific) and stacked using CombineZM software (Alan Hadley). Illumination was provided by shining four gooseneck incandescent spots on a translucent white diagonal collar around the microscope objective.

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<sup>1</sup> GMT is equivalent to UTC - neither has a summer time

(GMT)

local



## #Hymathon2022 - program

The program can also be accessed via a public Google calendar (click on "Agenda" or choose "Schedule" in the top right corner to have a list view of the talks); all times should appear in your own time-zone:

<https://calendar.google.com/calendar/u/0?cid=aHltYXRob24yMDIyQGdtYWlsLmNvbQ>

or, to avoid signing in:

<https://calendar.google.com/calendar/embed?src=hymathon2022%40gmail.com&ctz=Europe%2FLondon>

### Americas session - 31 March (local time: EDT, GMT -4)

Moderator: Miles Zhang

- (17:00 GMT) **13:00** **Introductory remarks - Miles Zhang**
- (17:05 GMT) **13:05** **Keynote presentation:**  
**DNA viruses of wasps in the Ichneumonoidea**  
Presenter: Gaelen Burke - [@GaelenBurke](#)
- (17:45 GMT) **13:45** **A revision of the Nearctic *Perilampus hyalinus* species group**  
Presenter: Jeong Yoo
- (18:00 GMT) **14:00** ***Eurytoma* parasitoid specialization in two co-occurring sister Tephritidae gallers**  
Presenter: Quinlyn Baine
- (18:15 GMT) **14:15** **Taxonomy of *Cotesia* Cameron (Hymenoptera: Braconidae) in the neotropical region, with emphasis on species that occur in Brazil**  
Presenter: Sarah Stephany Pereira Garcia
- (18:30 GMT) **14:30** **Break 1**
- (18:40 GMT) **14:40** **The Waspid Course: A New Model for Virtual Biodiversity Courses**  
Presenter: Louis Nastasi - [@toomanywasps](#)
- (18:55 GMT) **14:55** **"'Iä! Noonilla fhtagn!' Description of bizarre male genital skeletomusculature in the ant subfamily Leptanillinae, Emery (Hymenoptera: Formicidae)"**  
Presenter: Zachary Griebenow
- (19:10 GMT) **15:10** **UCE phylogenomics uncovers pervasive paraphyly and polyphyl in genera of Phaeogenini (Ichneumonidae: Ichneumoninae)**  
Presenter: Brandon Claridge
- (19:25 GMT) **15:25** **Dispatches from the Nearctic Oak Gall Renaissance**  
Presenter: Andrew Forbes/Miles Zhang - [@Lord\\_Forbington](#) / [@ymilesz](#)
- (19:40 GMT) **15:40** **The bees of Manitoba: there's a lot more than people thought**  
Presenter: Jason Gibbs - [@dialictus](#)



- (GMT)      **local**
- (19:55 GMT)    **15:55**    **Foraging behavior of the giant predatory ant *Dinoponera grandis* (Formicidae: Ponerinae) reveals individual spatial fidelity and increased territory exploration at the colony level.**  
Presenter: Priscila Elena Hanisch - [@PriscilaHanisch](#)
- (20:10 GMT)    **16:10**    **Break 2**
- (20:20 GMT)    **16:20**    **Mystery of the samba wasp**  
Presenter: Matthew Buffington
- (20:25 GMT)    **16:25**    **A new *Mymaromma* sp. (*Mymaromma* : Mymarommatidae) in Hawai'i and first host record for the superfamily**  
Presenter: David Honsberger
- (20:30 GMT)    **16:30**    **The nesting association between *Azteca* and *Polybia rejecta* (Hymenoptera: Formicidae and Vespidae) in the Cauca River valley, Colombia: a new geographical report and presence in urbanized areas**  
Presenter: Aymer Andrés Vásquez Ordóñez - [@VasquezAymer](#)
- (20:35 GMT)    **16:35**    **Keynote presentation:**  
**Challenges to be faced in the Systematics of Bethylidae**  
Presenter: Celso Azevedo
- (21:15 GMT)    **17:15**    **Wrap-up**
- (21:20 GMT)    **17:20**    **Social (including [virtual bingo](#))**

## **Australasia and East Asia session - 1 April (local time: ACDT, GMT +10.5)**

Moderator: Erinn Fagan-Jeffries

- (02:00 GMT)    **12:30**    **Introductory remarks - Erinn Fagan-Jeffries**
- (02:05 GMT)    **12:35**    **Keynote presentation:**  
**What's for dinner? Flower choice and decoy effects in flower-visiting hymenopterans**  
Presenter: Tanya Latty - [@TanyaLatty](#)
- (02:45 GMT)    **13:15**    **Parasitoids in the godown**  
Presenter: shweta mukundan - [@cervicapra](#)
- (02:50 GMT)    **13:20**    **An attempt to know Darwin Wasp diversity in Singapore**  
Presenter: Alexey Reshchikov - [@AReshchikov](#)
- (02:55 GMT)    **13:25**    **Intro to Insect Investigators: A school citizen science project**  
Presenter: Erinn Fagan-Jeffries - [@ErinnFJ](#)
- (03:00 GMT)    **13:30**    **Break 1**



- | (GMT)       | local   |
|-------------|---|
| (03:10 GMT) | <b>13:40</b> <b>Revealing the diversity of Austro-Pacific Bethyridae</b><br>Presenter: Karl Magnacca - <a href="#">@kmagnacca</a>   |
| (03:25 GMT) | <b>13:55</b> <b>Systematics, morphological phylogeny, and evolution of the male velvet ants of the tribe Smicromyrmini (Mutillidae) of East Asia</b><br>Presenter: Juriya Okayasu - <a href="#">@mutillidologist</a>                |
| (03:40 GMT) | <b>14:10</b> <b>Hidden diversity at night – Taxonomy of <i>Netelia</i> (Hymenoptera: Ichneumonidae: Tryphoninae) from Taiwan</b><br>Presenter: Hsuan-Pu Chen  |
| (03:55 GMT) | <b>14:25</b> <b>Morphological diversity of the genus <i>Olixon</i> in South Africa</b><br>Presenter: Leonard Strobel  |
| (04:10 GMT) | <b>14:40</b> <b>Putative new species and first host record of <i>Psyllaephagus</i> from <i>Lasiopsylla striata</i> in Australia.</b><br>Presenter: Alana McClelland - <a href="#">@entoandbento</a>                                 |
| (04:15 GMT) | <b>14:45</b> <b>Edible Hymenoptera and rural livelihood of ethnic communities of Nagaland</b><br>Presenter: Femi Benny  |
| (04:20 GMT) | <b>14:50</b> <b>Break 2</b>   |
| (04:30 GMT) | <b>15:00</b> <b><u>Keynote presentation:</u></b><br><b>Recent topics of spider web manipulation by ichneumonids (Pimplinae, the <i>Polysphincta</i> genus-group)</b><br>Presenter: Keizo Takasuka - <a href="#">@Reclinervellus</a> |
| (05:10 GMT) | <b>15:40</b> <b>Wrap-up</b>   |
| (05:15 GMT) | <b>15:45</b> <b>Social (including <a href="#">virtual bingo</a>)</b>  |

## Europe, Middle East and Africa session - 1 April (local time: CEST, GMT +2)

Moderator: Jessica Awad

- |             |  |
|-------------|--|
| (12:00 GMT) | <b>14:00</b> <b>Introductory remarks - Lars Krogmann</b>   |
| (12:10 GMT) | <b>14:10</b> <b><u>Keynote presentation:</u></b><br><b>Darwin wasps for Africa: Status quo of Afrotropical Ichneumonidae</b><br>Presenter: Simon van Noort |
| (12:50 GMT) | <b>14:50</b> <b>Break 1</b>  |
| (13:00 GMT) | <b>15:00</b> <b>Morphometry of Western Palearctic rose gall inducers – a first look</b><br>Presenter: Zoltán László - <a href="#">@_LaszloZoltan_</a>      |



- | (GMT)       | local  |
|-------------|--|
| (13:15 GMT) | <b>15:15 Morphometrical approach in the species delimitation</b><br>Presenter: Andrey Rudoy  |
| (13:30 GMT) | <b>15:30 Bionomic features of <i>Pteromalus semotus</i> (Walker) (Hymenoptera: Pteromalidae)</b><br>Presenter: Vladimir E. Gokhman                                     |
| (13:35 GMT) | <b>15:35 Reporting the genus <i>Agraulomyrmex</i> Prins, 1983 (Formicidae: Formicinae) in India</b><br>Presenter: Anand Harshana - <a href="#">@AnandEntomology</a>    |
| (13:40 GMT) | <b>15:40 <i>Ancistrocerus</i> wasps (Vespidae) in the centre of Europe: a common new cryptic species and their confusing phylogeny</b><br>Presenter: Miglė Lazauskaitė |
| (13:45 GMT) | <b>15:45 New taxa of Bethylidae (Chrysoidea) from the Lower Eocene amber of France</b><br>Presenter: Manuel Brazidec - <a href="#">@manu_bzd</a>                       |
| (13:50 GMT) | <b>15:50 Tackling the enigma of Ceraphronoidea</b><br>Presenter: Marina Moser - <a href="#">@MarinaMoser_</a>  |
| (13:55 GMT) | <b>15:55 Break 2</b>   |
| (14:05 GMT) | <b>16:05 The young lady and the old man from the early Eocene – two new fossil ichneumonid species</b><br>Presenter: Alexandra Viertler - <a href="#">@AViertler</a>   |
| (14:20 GMT) | <b>16:20 Social Glands in Non-social Insects: A metapleural gland in Pelecinidae</b><br>Presenter: Jonah M. Ulmer - <a href="#">@JonahMUlmer</a>                       |
| (14:35 GMT) | <b>16:35 How dark of a taxon is Microgastrinae (Braconidae) really?</b><br>Presenter: Amelie Höcherl   |
| (14:50 GMT) | <b>16:50 Phylogeny, biogeography and evolution of life-history traits of Megastigmidae (Hymenoptera: Chalcidoidea)</b><br>Presenter: Julie Böhmová                     |
| (15:05 GMT) | <b>17:05 Sexual dimorphism in Ichneumoninae and the neglected influence of the ecological niche</b><br>Presenter: Adrien Mathou  |
| (15:20 GMT) | <b>17:20 Understanding the Immune pathways and Common Diseases in Red Mason Bees</b><br>Presenter: Fiona Tainsh - <a href="#">@FionaTainsh</a>                         |
| (15:35 GMT) | <b>17:35 Break 3</b>   |
| (15:45 GMT) | <b>17:45 <u>Keynote presentation:</u><br/>Consequences of competitive interactions between parasitoids for biological control</b><br>Presenter: Tim Haye               |



(GMT)

local



(16:25 GMT) **18:25** Wrap-up including photo competition and student competition results

(16:45 GMT) **18:45** Social (including [virtual bingo](#))



**Pollen grains cling to the antennae of a perilampid wasp.** Photograph by Ian Schramm  
Pollen grains cling to the antennae of a perilampid wasp (*Euperilampus triangularis*) as it visits an aster flower. Photographed July 4th, 2021, in the Supawna Meadows National Wildlife Refuge, New Jersey, USA. Equipment: Nikon d3500, Laowa 100mm Macro Lens, Venus Optics KX-800 Twin Flash.



## #Hymathon2022 - abstracts

### Americas session - 31 March (local time: EDT, GMT -4)

**(17:05 GMT) 13:05 KEYNOTE PRESENTATION: DNA viruses of wasps in the Ichneumonoidea**

Dr. Gaelen Burke (University of Georgia, USA)

Dr. Gaelen Burke completed her undergraduate degree at the University of Queensland in Australia and her PhD with Dr. Nancy Moran at the University of Arizona, working on bacterial symbionts of sap-sucking insects. She began her research on viruses of parasitoids during a postdoc at the University of Georgia, and has continued to expand on that theme as an Assistant and now Associate Professor at the same institution. Her research focuses upon DNA viruses that are carried by wasps in an endogenous or exogenous form and play a role in the lethal interactions between parasitoids and hosts. Dr. Burke and her group members use genomics to discover new virus relationships and characterize the genomes of viruses associated with parasitoids, and also experimental manipulations of parasitoids, viruses, and their genes to learn how these disparate entities function.

**(17:45 GMT) 13:45 A revision of the Nearctic *Perilampus hyalinus* species group**

Jeong Yoo (The Royal Ontario Museum, Toronto, Canada); Chris Darling (The Royal Ontario Museum, Toronto, Canada)

Abstract

*Perilampus hyalinus* group (Chalcidoidea, Perilampidae) is a species group of parasitoid wasps widely distributed in the Western Hemisphere. There are two main source of taxonomic confusions pertaining to this group: 1) specimens identified as *P. hyalinus* Say are either Primary parasitoids or Hyperparasitoids, and were reared from different species of insect hosts; 2) the identities of the described species in this group are uncertain due to poor descriptions. My thesis is to address these two questions through the revision of Nearctic species with morphology, COI, ITS2, and host information.

**(18:00 GMT) 14:00 *Eurytoma* parasitoid specialization in two co-occurring sister Tephritidae gallers**

Quinlyn Baine; Vince Martinson; Emily Casares; Ellen O Martinson (ALL: University of New Mexico, Albuquerque, New Mexico, USA)

Abstract

Insect-induced galls are both morphologically diverse and serve as a habitat not only to the inducer but to several other highly specialized arthropod functional groups that are often Hymenopterans, and generally under-described. Because both gall morphologies and community compositions are specific to inducer, they can each be treated as an extended phenotype of the inducer, and we can utilize community genetics to investigate direct effects of genotype on extended phenotype. Mass-rearings from two gall morphologies induced by sister taxa *Aciurina trixa* and *Aciurina bigeloviae* (Tephritidae) within overlapping ranges in northern New Mexico resulted in the documentation of 14 species of primarily wasps among the two gall morphologies. In order to find potential genotypic specialization within the community associated with each *Aciurina* species, we barcode-sequenced select





gene regions from the inducer (*Aciurina*) and the most abundant primary parasitoid wasp (*Eurytoma* spp.) We constructed multi-gene consensus trees using maximum likelihood for all barcoded taxa and found *Eurytoma* parasitoid wasps formed clades that correlate to gall morphology with over 3% difference in identity between lineages. This provides evidence that these parasitoids are highly specialized, even in sites where the two gallers co-occur, and may be speciating with the inducer.

**(18:15 GMT) 14:15 Taxonomy of *Cotesia* Cameron (Hymenoptera: Braconidae) in the neotropical region, with emphasis on species that occur in Brazil**

Sarah Stephany Pereira Garcia - Student. Av. Pádua Dias, 235 - Piracicaba - SP, 13418-900. University of Sao Paulo - 'Luiz de Queiroz Agriculture College; Eduardo Mitio Shimbori - Post Doctorate. Av. Pádua Dias, 235 - Piracicaba - SP, 13418-900. University of Sao Paulo - 'Luiz de Queiroz Agriculture College

Abstract

*Cotesia* Cameron, 1891 is the second largest genus of the subfamily Microgastrinae (Hymenoptera: Braconidae) with 328 described species. For the Neotropical region, 33 species are known, 13 of which are present in Brazil. The genus has no revision or identification tools for the neotropical species. Thus, our aims are: (1) to provide the taxonomic bases for the genus in Brazil, (2) to propose a dichotomous identification key for the species of *Cotesia* that occur in Brazil, (3) to analyze a potential species complex that exploits species of economic importance. Morphological and molecular analyzes were used, as well as preliminary phylogenetic analyzes and geometric morphometry of the forewings of female specimens. Three new species of *Cotesia* that occur in Brazil were discovered and described, provisionally called *Cotesia* sp.n.1, C.sp.n.2 and C sp.n.3. The species 1 and 3 are associated with economically important hosts: *Chrysodeixis includens* (Walker,1858), *Spodoptera frugiperda* (JE Smith,1797), *Plutella xylostella* (Linnaeus,1758) for C. sp.n.1, and *Anticarsia gemmatalis* (Hübner,1818) for C. sp.n.3. The study proved through morphological, molecular and morphometric analyzes that C. sp.n.1 is a single species with a wide distribution range in the New World. Our results highlight the importance of integrating different methods when dealing with taxonomy of parasitoids. The contributions presented here should enable the identification of known species of *Cotesia* in Brazil, promoting work aimed at taxonomic revisions and descriptions of new species, aiding new biological control programs.

**(18:40 GMT) 14:40 The WaspID Course: A New Model for Virtual Biodiversity Courses**

Louis F Nastasi (PSU)

Abstract

The WaspID Course is a new course covering all aspects of wasps, especially biology, ecology, preservation and curation, and taxonomy. The course, which ran its first session in January 2022, was an attempt to bring traditional in-person biodiversity courses to a virtual space. I discuss the WaspID Course model, its challenges, its reception, and its future.



**(18:55 GMT) 14:55 "'Iä! Noonilla fhtagn!' Description of bizarre male genital skeletomusculature in the ant subfamily Leptanillinae, Emery (Hymenoptera: Formicidae)"**

Zachary Griebenow (University of California, Davis, USA); Ziv Lieberman (University of California, Davis, USA); Adrian Richter (Friedrich Schiller University, Jena, Germany); Georg Fischer (unaffiliated); Evan Economo (Okinawa Institute of Science & Technology, Onna, Japan); Thomas van de Kamp (Karlsruhe Institute of Technology, Karlsruhe, Germany)

Abstract

The structural diversity of male genitalia in insects is profuse, and a perennial fascination for morphologists and systematists alike. This anatomical region is a rich source of morphological data useful both in phylogenetic inference and taxon delimitation, including for the ants (Formicidae); and especially so for the obscure subfamily Leptanillinae Emery, which is largely known from male specimens. Here, we summarize findings from our comparative study of male genital skeletomusculature across major clades within the Leptanillinae, based upon virtual dissections derived from micro-CT data for nine example leptanilline lineages (plus three ant outgroups) for which phylogeny has been inferred. We find that male genital skeletomusculature in the Leptanillinae is often highly derived relative to the putative formicid groundplan, with striking morphological disparity between sampled leptanilline lineages. Many of these skeletomuscular innovations are not only unique among all ants, but exceptional among male Hymenoptera, so far as is known. The disparity of male genital morphology across the Leptanillinae is tempered by parallelism—we adduce a tendency towards skeletomuscular simplification, which results in homoplasious muscle losses and scleritic fusions. We conclude with the theoretical implications of observed male genital skeletomuscular diversity in leptanilline ants, along with its magnitude relative to that observed in other ant clades, and speculate on the evolutionary origin of this phenomenon.

**(19:10 GMT) 15:10 UCE phylogenomics uncovers pervasive paraphyly and polyphyly in genera of Phaeogenini (Ichneumonidae: Ichneumoninae)**

Brandon Claridge (Utah State University, Logan, USA)

Abstract

Phaeogenini is a moderately diverse tribe of small ichneumonid wasps, yet it is one of the least-studied groups of ichneumonids both in terms of its taxonomy and internal phylogenetic relationships. No comprehensive worldwide treatment of Phaeogenini genera is available, nor has the monophyly of the genera been tested. Consequently, the generic boundaries are uncertain, which has impeded further taxonomic or other research. Here, I present preliminary results of the first densely-sampled phylogeny of Phaeogenini. First, a maximum likelihood phylogenomic analysis was conducted using UCEs (ultraconserved elements) from 97 species in 28 phaeogenine genera, including several putative, undescribed genera from the Neotropics. To add additional taxa not sampled for UCEs, a COI-based phylogeny was inferred using COI by-catch sequences from the UCE samples and publicly available COI sequences from BOLD with the initial UCE phylogeny used as a constraint tree. Both phylogenies show pervasive paraphyly and polyphyly among phaeogenine genera. The prevalence of these non-monophyletic groups suggests that major changes to the current classification are necessary to render Phaeogenini genera both monophyletic and diagnosable. Furthermore, these results illustrate the need for more densely-sampled phylogenomic studies to test the monophyly of ichneumonid genera.



**(19:25 GMT) 15:25 Dispatches from the Nearctic Oak Gall Renaissance**

Andrew Forbes, University of Iowa. Iowa City, USA; Miles Zhang, USDA, Washington DC, USA; Anna Ward, University of Iowa. Iowa City, USA

Abstract

The diversity of oak gall wasps and their associated communities of associated insects in the Nearctic has been understudied relative to those in the Palearctic. But as molecular ecological methods have become more accessible, several recent efforts have converged and we are quickly learning new information about the diversity, evolution, and natural history of these rich insect assemblages. We will share some recent work by us and our collaborators about oak gall wasps, their inquilines, and their parasitoids, and discuss myriad exciting prospects for future work.

**(19:40 GMT) 15:40 The bees of Manitoba: there's a lot more than people thought**

Jason Gibbs (University of Manitoba, Winnipeg, Canada); Emily Hanuschuk (University of Manitoba, Winnipeg, Canada); Reid Miller (University of Manitoba, Winnipeg, Canada); Melanie Dubois (Agriculture and Agri-food Canada, Brandon, Canada); Massimo Martini (University of Manitoba, Winnipeg, Canada); Cory Sheffield (Royal Saskatchewan Museum, Regina, Canada); Sophie Cardinal (Agriculture and Agri-food Canada, Ottawa, Canada); Thomas Onuferko (Canadian Museum of Nature, Ottawa, Canada)

Abstract

A checklist of the bees of Manitoba has been in progress for 5-years and is nearing publication, albeit not completion. Previous estimates of the bee fauna for the province was about 260, but the current estimate is approximately 380. During compilation of this list, we have documented new distributional records at the generic level for Manitoba (*Ashmeadiella*, *Brachymelecta*, *Eucera*, *Neolarra*, and *Triepeolus*) and new species records for Canada. We recollected the rare bee *Epeoloides pilosulus* after a 95-year absence in the province. Two new species have already been described. We proposed new synonymies and believe one previous synonymy was done in error. Mostly we're just talking about cool bees and showing some cool pictures.

**(19:55 GMT) 15:55 Foraging behavior of the giant predatory ant *Dinoponera grandis* (Formicidae: Ponerinae) reveals individual spatial fidelity and increased territory exploration at the colony level.**

Hanisch PE (MACN/CABA/Argentina) ; Hanisch ER (SENYT/La Plata/Argentina); Blanco V (UBA/CABA/Argentina); Tubaro PL (MACN/CABA/Argentina); Suarez AV (Illinois University/Urbana-Champaign/USA).

Abstract

Social organisms benefit from division of labor and collective behaviors. However, if individuals overlap widely in their efforts, these benefits may not be proportional to the number of individuals that take part in an activity. We examined foraging behavior and route fidelity in colonies of the ant *Dinoponera grandis*, a large species with relatively few active foragers that lack nestmate recruitment and chemical trailing behavior. For twelve colonies, we marked individual foragers and mapped their foraging routes to test the hypotheses that each ant specializes in a particular area around the nest, and that this route fidelity increases the overall area covered by the colony. For each individual, we recorded the mean direction and duration of each foraging trip, foraging success and maximal distance from the nest. For each



colony, we measured the number of workers and the total foraging area. Additionally, we measured the Shannon's Entropy to describe the foraging behavior structure of the colonies. Overall, we mapped 272 foraging routes from 95 different foragers. The total area used by each colony averaged 66.2 m<sup>2</sup>. Within colonies, over 68% of foragers exhibited a high degree of route fidelity, with most foragers following different foraging directions. While in a few colonies some areas were heavily explored, most of the colonies had a high Shannon's Entropy, indicating an even exploration of the foraging territory. This strategy increases foraging efficiency and search area, and may be particularly important for species with relatively few foragers.

**(20:20 GMT) 16:20 Mystery of the samba wasp**

Matt Buffington and Jeffrey Sosa-Calvo

Abstract

The samba wasp, *Ganaspis brasiliensis*, is one of the most lethal natural enemies of the invasive spotted wing drosophila. Evidence suggests, however, that the samba wasp, as currently circumscribed, may be a cryptic species complex. We weigh the evidence of these arguments, and suggest a direction forward on this fascinating question of species limits

**(20:25 GMT) 16:25 A new *Mymaromma* sp. (*Mymaromma* : Mymarommatidae) in Hawai'i and first host record for the superfamily**

David Honsberger (University of Hawai'i at Mānoa); John Huber (Natural Resources Canada c/o Canadian National Collection of Insects); Mark Wright (University of Hawai'i at Mānoa)

Abstract

A new species of *Mymaromma* (Mymarommatoidea: Mymarommatidae) was found emerging from eggs of a *Lepidopsocus* sp. (Psocodea: Lepidopsocidae) in Hawai'i. This provides the first host record for the superfamily Mymarommatoidea, the last superfamily of parasitoid Hymenoptera for which no hosts were known, and comes approximately 100 years after the first extant species was described.

**(20:30 GMT) 16:30 The nesting association between *Azteca* and *Polybia rejecta* (Hymenoptera: Formicidae and Vespidae) in the Cauca River valley, Colombia: a new geographical report and presence in urbanized areas**

Aymer Andrés Vásquez Ordóñez (Fundación Ecovivero & Universidad del Valle, Santiago de Cali, Colombia)

Abstract

The nesting association between the *Azteca* and *Polybia rejecta* (Hymenoptera: Formicidae and Vespidae) has been described in Brazil, Costa Rica, and French Guiana. Despite both taxonomic groups have been recorded in Colombia, they have never been reported nesting together in this country. This relationship has been described as an interesting case of interspecific nest associations, with many ecological and evolutionary explanations, giving more relevance to the predation pressures on nests. Recently, I found both species nesting together in the cities of Santiago de Cali and Tuluá and The Laguna de Sonso Nature Reserve in the Cauca River valley, Valle del Cauca, Colombia. In all cases, the nests were located on tree branches or stems in urban areas and native vegetations close to lakes or wetlands. Previous reports documented the relationship in non-urban habitats, such as forests,



forest edges and open grasslands. However, the new record in Colombia expands the association of these ant and wasp in urbanized areas.

**(20:35 GMT) 16:35 KEYNOTE PRESENTATION: Challenges to be faced in the Systematics of Bethyloidea**

Professor Celso Azevedo (The Federal University of Espírito Santo, Brazil)

I was teacher of several junior and high schools from 1982 to 1993. Then I have been professor at UFES, a federal university located in Espírito Santo, Brazil since 1993. I started working on Bethyloidea in 1988. At first, my studies was focused on the alpha taxonomy of Neotropical fauna under morphological approach. In 2012, while passing by Paris Museum I fortuitously entered into the world of Paleontology. Then, I included Phylogenetics in my studies. Following the trends, more recently I also introduced molecular approach on the desk. Hitherto I described three new extinct subfamilies, 30 new genera and almost 950 new species from all over the world. I am also subject editor of Zootaxa, section of Chrysidoidea.

**Australasia and East Asia session - 1 April (local time: ACDT, GMT +10.5)**

**(02:05 GMT) 12:35 KEYNOTE PRESENTATION: What's for dinner? Flower choice and decoy effects in flower-visiting hymenopterans**

Assoc. Prof Tanya Latty (The University of Sydney, Australia)

Assoc. Prof Tanya Latty's research focuses broadly on invertebrate behaviour and ecology with a particular interest in the intersections between entomology, behaviour, conservation, pest management and technology. Her recent research directions include understanding the impacts of urbanisation on insect pollinators, understanding flower choice in predatory and pollinating insects, developing methods for predicting and preventing colony collapse in honeybees, investigating social behaviours in velvet worms and using insects and slime moulds as models for bio inspired technologies.

**(02:45 GMT) 13:15 Parasitoids in the godown**

Shweta Mukundan (University of Calicut)

Abstract

Parasitic Hymenoptera are a widespread yet elusive group of insects. They are correlated to the presence of their host groups. A food grain storage godown of 7500 MTs capacity in West Hill located in Kozhikode district, Kerala state, India is the site from where the observations are made. The godown follows traditional prophylactic (spraying Deltamethrin and Malathion) and curative measures (fumigating with Aluminium phosphide tablets) for the control of pests. But, the biocontrol services rendered by the parasitoids goes unnoticed and unrecognized. It is time we acknowledge and applaud the unsung heroes of the godown!



**(02:50 GMT) 13:20 An attempt to know Darwin Wasp diversity in Singapore**

Alexey Reshchikov (Institute of Eastern-Himalaya Biodiversity Research, Dali, China);  
Marina Mazón (National University of Loja, Loja, Ecuador)

Abstract

The first intensive two years Darwin wasps sampling in mangroves and swamp forests of tropical Singapore megapolis revealed highly differentiated assemblages. A total of 919 individuals of 132 species from 16 subfamilies studied. The richest and most abundant subfamily is Cryptinae representing about half the richness of the total sampling. DNA barcoding proved to be very useful for a rapid sorting of the Darwin wasp species. The one-year sampling collected 61.46-68.28% of the potential richness in the four mangroves sampling sites. Analysis of beta diversity showed that the most abundant species evenly distributed through studied localities.

**(02:55 GMT) 13:25 Intro to Insect Investigators: A school citizen science project**

E.P. Fagan-Jeffries (The University of Adelaide & South Australian Museum); A.R. McClelland (The University of Adelaide).

Abstract

Inspired by the Canadian School Malaise Trap project, Insect Investigators is working with 50 schools in regional and remote Australia as part of a citizen science project. At the time of this presentation, schools will have just finished running their Malaise traps for four weeks, and we'll have just started sorting the samples. We'll share the highs and lows of getting the project off the ground, and our hopes for the rest of the year in terms of outreach and scientific results.

**(03:10 GMT) 13:40 Revealing the diversity of Austro-Pacific Bethyridae**

Karl Magnacca (Division of Forestry and Wildlife, Honolulu, HI, USA)

Abstract

The bethyrid fauna of Australia and the Pacific Islands is largely undescribed, and for the subfamily Bethyridae is dominated by the genus *Sierola*. Previously known to have radiated extensively in Hawaii, recent work using museum collections has shown that diverse groupings are present on virtually all high islands of the Pacific, with many species undoubtedly still to be collected. Australia contains several hundred species, including a more extensive range of morphotypes than in the Pacific, indicating it is likely the center of diversity. The Australian taxa also blur the divisions between bethyrid genera, requiring redefinition of *Sierola* and *Goniozus*.

**(03:25 GMT) 13:55 Systematics, morphological phylogeny, and evolution of the male velvet ants of the tribe Smicromyrmini (Mutillidae) of East Asia**

Juriya Okayasu (Hokkaido University, Sapporo, Japan)

Abstract

Velvet ants show distinct sexual dimorphism; the male and female of a particular species are difficult to be associated based on morphology, leaving hundreds of nominal species described from only one sex. The tribe Smicromyrmini is widespread in the Old World. Historically, East Asian species of this tribe had been placed in a single genus *Smicromyrme*. For the last four decades, A.S. Lelej and his collaborators have sorted East Asian *Smicromyrme* species into several genera including new ones. His taxonomic concepts have been followed by recent taxonomic works. However, systematic basis for Smicromyrmini genera is still incomplete, because most of those genera are diagnosed based exclusively on the male morphology due to the larger





number of available characters, including male genitalia. Additionally, many East Asian mutillids are described in the old literature and are never revised. Therefore, the genus concepts of the previously established taxa are based on the limited taxon sampling. Many female-based species are left unsorted. Reliable identification of newly collected material largely depends on direct comparison with types or identified specimens, hampering molecular studies to associate dimorphic sexes. One potential solution of this situation is to arrange the Smicromyrmini genera based solely on males using museum specimens, specifically types, and subsequently associate females to males that are reliably placed in the revised classification system. For this purpose, I aimed to revise East Asian smicromyrmini genera based on the male morphology and analyzed phylogenetic relationships among them. Genus-level classification and its implications to morphological evolution are discussed.

**(03:40 GMT) 14:10 Hidden diversity at night – Taxonomy of *Netelia* (Hymenoptera: Ichneumonidae: Tryphoninae) from Taiwan**

Hsuan-Pu Chen (Department of Entomology, National Taiwan University/Taipei/Taiwan); Shih-Feng Shiao (Department of Entomology, National Taiwan University/Taipei/Taiwan)

Abstract

Nocturnal or crepuscular taxa of Ichneumonoidea usually have convergent characters called “ophionoid facies”, they are typically the brown-yellow coloration, long antennae, and large ocelli. *Netelia* is an ophionoid-faced nocturnal genus of high species richness with 323 described species. They are koinobiont ectoparasitoid wasps which the larvae using lepidopterans as hosts, attaching on the hosts’ body surface and consuming until killing them. Most *Netelia* species have similar external morphologies, frequently caused misidentifications in the past. Until 1938, it was found that *Netelia* species can be better distinguished by the specialized structure on parameres of male genitalia, and then taxonomic system of this genus was better established. *Netelia* is now subdivided into 12 subgenera based on characters of external morphology and male genitalia, however, the monophyly of congeneric taxa lack comprehensive phylogenetic hypothesis. Moreover, taxonomic system which mainly based on the male genitalia also makes correct identification of most female specimens difficult. In this study, preliminary review based on literatures, museum collections and specimens collected from middle to high elevation make Taiwanese fauna increasing from 16 species in 4 subgenera to more than 30 species in 10 subgenera. Although the precise identification of some Taiwanese species is still pending, our results do suggest the highly underestimated species richness of this commonly collected nocturnal group. In the future, we are going to develop DNA barcode library of Taiwanese species and test the monophyly of *Netelia* species from Taiwan and neighboring regions by molecular phylogeny, and revise its taxonomic system by integrated approaches.

**(03:55 GMT) 14:25 Morphological diversity of the genus *Olixon* in South Africa**

Leonard Strobel (University of Bremen, Bremen, Germany); Volker Lohrmann (Übersee-Museum Bremen, Bremen, Germany)

Abstract

The family of the Rhopalosomatidae is a sparsely investigated group of aculeate Hymenoptera which is considered to be the sister group of the Vespidae. With less than 100 species, they contain a comparably low number of recent species even



though recent efforts of the last 15 years led to the discovery of new taxa from almost all larger biogeographic regions. Still, some genera have not been investigated thoroughly, e.g., the *Olixon* fauna of continental Africa, which is mainly due to the low number of available specimens. Only six *Olixon* species are known from Africa as a whole, including two species from Madagascar. One of the continental species, *Olixon dentatum* (Cameron, 1904), that has been revised by Townes in 1977, who described it as being “variable in structure and color” and that it “possibly [...] should be subdivided into several species”. In this study, numerous specimens previously assigned to *Olixon dentatum* and additional specimens sampled in Southern Africa were examined based on external morphology. The investigation, based on discrete characters in combination with morphometric measurements, revealed eight putative morphospecies – seven of which likely new to science – indicating that the species richness of the Rhopalosomatidae from continental Africa is not yet adequately recorded and that more species can be expected from other parts of the continent.

**(04:10 GMT) 14:40 Putative new species and first host record of *Psyllaephagus* from *Lasiopsylla striata* in Australia.**

Alana McClelland (University of Adelaide, Adelaide, Australia); Erinn Fagan-Jeffries (University of Adelaide, Adelaide, Australia); Juanita Rodriguez (CSIRO, Canberra, Australia); Steve Cooper (University of Adelaide, Adelaide, Australia); Andy Austin (University of Adelaide, Adelaide, Australia)

Abstract

The genus *Psyllaephagus* is a prolific, yet largely undescribed genus of Encyrtid wasps. Those from Australia are likely to be as widespread as their Psyllid hosts which are ubiquitous on Eucalypts around the country. Here, a putatively new species is described as the first recorded parasitoid of the lerp forming Psyllid, *Lasiopsylla striata* in Australia. Robust methods are presented for rapid species diagnoses to address the shortcomings in addressing the vast numbers of undescribed Hymenoptera worldwide.

**(04:15 GMT) 14:45 Edible Hymenoptera and rural livelihood of ethnic communities of Nagaland**

Femi E Benny, Thejavikho Chase, Priyadarsanan Dharma Rajan

Abstract

Insects as food and feed emerge as a relevant issue in the twenty-first century where alternative solutions to conventional livestock and feed sources need to be found urgently. In India, several communities in the Northeast use insects as food, feed and for medicine. Among the tribes of the Northeast, insects of the order Hymenoptera is one of the most preferred delicacies and also considered a health supplement. The present study was carried out through market surveys, direct interviews and field collections in the Northeast to document ethnozoological knowledge among the indigenous communities. Around 28 species of this order are consumed and used in traditional medicine in this area. Also, several edible insects of this order like hornets are being successfully domesticated here. The ethnographic surveys carried out among the ethnic tribes revealed that chemicals generated by Hymenopterans like bees, hornets and other wasps for self-defense are being used in entomotherapeutics for the treatment of a variety of ailments like rheumatoid arthritis, stomach disorders, skin diseases, pain and infections, cancer, tissue repair and so on.



**(04:30 GMT) 15:00 KEYNOTE PRESENTATION: Recent topics of spider web manipulation by ichneumonids (Pimplinae, the *Polysphincta* genus-group)**

Dr. Keizo Takasuka (Keio University, Japan)

Dr Keizo Takasuka completed his PhD at Ehime University (Matsuyama, Japan) in 2011, before becoming a Postdoctoral Fellow at Kobe University until 2016. In 2017 Dr Takasuka moved to Keio University, where he currently researches the behavioral ecology, natural history, evolutionary biology and molecular biology of ichneumonid spider-ectoparasitoids (the *Polysphincta* genus-group).

**Europe, Middle East and Africa session - 1 April (local time: CEST, GMT +2)**

**(12:10 GMT) 14:10 KEYNOTE PRESENTATION: Darwin wasps for Africa: Status quo of Afrotropical Ichneumonidae**

Dr. Simon van Noort (Iziko Museums of South Africa, South Africa)

Simon van Noort is Curator of Entomology at the Iziko South African Museum in Cape Town. He obtained his PhD on the systematics and phylogeny of fig wasps from Rhodes University in 1992. His research focuses on the systematics and biology of wasps, although other insect orders are also treated, with a publication output of over 150 scientific articles. He is an avid field biologist and has participated in numerous research expeditions across Africa including several trips to East Africa and the Congo basin. Documentation of the wealth of unknown Afrotropical wasp diversity is his passion with a long-term goal to produce a synthesised resource to facilitate the ongoing discovery and description of African taxa. The foundations for this have been laid and continue to be developed on the online platform WaspWeb [www.waspweb.org](http://www.waspweb.org). Superfamilies are being sequentially revised and published with a view to eventually bringing the data all together in a synthesised book on Afrotropical Hymenoptera.

**(13:00 GMT) 15:00 Morphometry of Western Palearctic rose gall inducers – a first look**

Zoltán László (Hungarian Department of Biology and Ecology, UBB/Cluj-Napoca/Romania)

Abstract

Species of the genus *Diplolepis* (Hymenoptera: Cynipoidea) induce plant galls exclusively on wild roses, giving rise to diverse structures on plants that protect and feed the wasp larvae inside them. The known number of *Diplolepis* species in the Western Palearctic is small, with only 6 species recorded from the continent. The adult wasps of two species, *D. rosae* and *D. mayri*, can be difficult to identify without associated galls because keys are based on inconsistent morphological characters. It also appears that several morphological characters overlap between the two species. To address this problem I analysed the variation in morphological characters in several populations of the *D. rosae* and *D. mayri*, as well as populations of three other Western Palearctic species: *D. spinosissimae*, *D. eglanteriae*, and *D. nervosa*. A total of 25 morphometric characters from 178 specimens were measured and analysed using multivariate ratio analysis to identify the best character ratios separating these 6 species. Results suggest that separation of the Western Palearctic *Diplolepis* species can be performed on the basis of morphometric characters not



previously used in identification keys. As a continuation the morphometric analyses will be complemented with other Palearctic species as *D. abei*, *D. japonica* and *D. nitidus/nigriceps* in order to prepare an identification key for most of the Palearctic *Diplolepis* species.

**(13:15 GMT) 15:15 Morphometrical approach in the species delimitation**

Andrey Rudoy (independent), Rafael Ferrari (Chinese academy of science), Niu Geng Yun (Xijiang Normal university)

Abstract

We provide different morphometrical approaches: combination of linear measurements of ocelli and antennae of *Siobla* ssp (Symphyta, Tenthredinidae), sliding semilandmarks of the ovipositor' parts of *Encyrtus* ssp (Chalcidoidea, Encyrtidae), and fixed landmarks of the components of the male genitalia of *Colletes* ssp (Apoidea, Colletidae). Only in case of *Siobla* morphometrical analysis separate all species with no ambiguous specimens. Analyzed specimens form two clusters. In the cluster with abdominal yellow band ratio between length of each of five distal antennal segments and width of the middle ocellus separates species completely. In the cluster with no band species specific trait is ratio between sizes of the ocelli and distance among them. In *Encyrtus* sliding semilandmarks show only statistical difference among multiple lineages, described as one species, but molecularly different. Fixed landmarks are resolving two species only if applied multiple modes of the data compression.

**(13:30 GMT) 15:30 Bionomic features of *Pteromalus semotus* (Walker) (Hymenoptera: Pteromalidae)**

Matvey I. Nikelshparg (Saratov State University/Saratov/Russia); Vladimir E. Gokhman (Moscow State University/Moscow/Russia)

Abstract

In the south of Eastern Europe, the gall wasp *Aulacidea hieracii* (Bouché) causes multilocular stem galls on certain hawkweeds, including *Hieracium robustum* Fries (Asteraceae). This gall wasp is attacked by eleven parasitoid species, which, except for *Exeristes roborator* (Fabricius), the only member of the family Ichneumonidae, belong to the superfamily Chalcidoidea. Among these parasitic wasps, there are two species of the genus *Pteromalus* (Pteromalidae), which are identified as *P. vibulenus* (Walker) and *P. semotus* (Walker). We have studied certain life-history characteristics of the latter species. *P. semotus* emerges from the galls almost simultaneously with the hosts. As many other parasitoids, this *Pteromalus* species is obviously protandrous, i.e., its males appear up to four days earlier than females, with an approximate sex ratio of 1:1. Adult females of *P. semotus* can construct feeding tubes to feed on the hosts concealed inside the galls. This species is a facultative hyperparasitoid of the genera *Eurytoma* and *Sycophila* (Eurytomidae), mostly of *E. cynipsea* (Boheman) and *S. submutica* (Thomson). For *P. semotus*, it usually takes 3 to 7 minutes to oviposit on the hosts. The female of this species remains relatively quiet during egg-laying. After finishing the process, she usually does not move far from the oviposition site for about 20 minutes. During this time, the female aggressively attacks any approaching wasp using her large mandibles, similarly to a few other members of the family Pteromalidae.



**(13:35 GMT) 15:35 Reporting the genus *Agraulomyrmex* Prins, 1983 (Formicidae: Formicinae) in India**

Anand Harshana (Division of Entomology, ICAR-Indian Agricultural Research Institute, New Delhi, India); DEBJANI DEY (Division of Entomology, ICAR-Indian Agricultural Research Institute, New Delhi, India)

Abstract

*Agraulomyrmex* Prins, 1983 is a rare formicine genus under tribe Plagiolepidini. The genus morphologically differs from other formicine genera by the structure of the mesosoma (i.e. absence of mesometanotal suture and metanotal groove), antennae with 9–10 segments lacking a distinct club, and absence of ocelli. Until recently, the genus was only represented by two valid species, viz., *A. meridionalis* Prins, 1983, and *A. wilsoni* Prins, 1983, both of which are described from Africa. A third species, *A. damohensis* Harshana & Dey, 2021 was recently discovered in India. The new species is compared to the two previously described African species of the genus, and it is distinguished by its nine segmented antennae.

**(13:40 GMT) 15:40 *Ancistrocerus* wasps (Vespidae) in the centre of Europe: a common new cryptic species and their confusing phylogeny**

Miglė Lazauskaitė (Nature Research Centre/Vilnius/Lithuania); Anna Budrienė (Nature Research Centre/Vilnius/Lithuania); Svetlana Orlovskytė (Nature Research Centre/Vilnius/Lithuania); Eduardas Budrys (Nature Research Centre/Vilnius/Lithuania)

Abstract

While identifying the inhabitants of Hymenoptera trap-nests with application of DNA barcoding, we found samples too different to be haplotypes of the related widespread species *Ancistrocerus trifasciatus*. The finding was unexpected, considering that Lithuania is at the mid point of Europe, if estimated as the centre of gravity of the continent, and the regional vespidae fauna seems to be well studied. For testing the hypothesis that these haplotypes represent a new cryptic species, we analysed the haplotype diversity based on the mtDNA sequences CO1 and CO2. It included 21 and 6 haplotypes correspondingly of the common *A. trifasciatus* and the new cryptic species, the status of which was confirmed using formal species delimitation methods ASAP, PTP and GMYC. To clarify the phylogenetic relationships among the new and the other species of *Ancistrocerus* of the Northern Europe, we sequenced and applied for phylogeny reconstruction longer parts of the mtDNA (CO1, CO2, ATP8, ATP6, CO3, ND3, ND6, CytB and partial ND1 genes), the markers of the nuclear rDNA (partial 18S and 28S, ITS1 and ITS2) and 9 EPIC markers of the nuclear protein-coding genes. Comparison revealed that the phylogeny reconstructions using the presumably neutral mtDNA, rDNA and intron sequences with approximately stable evolutionary rate may considerably differ from the reconstructions based on the exon sequences of genes, including transcriptomes. The latter may have been under selection pressure, thus their evolutionary rate may have varied dependently on the niche of the ancestors during their evolutionary history.



**(13:45 GMT) 15:45 New taxa of Bethylinidae (Chrysoidea) from the Lower Eocene amber of France**

Manuel Brazidec (Université Rennes 1, Rennes, France); Vincent Perrichot (Université Rennes 1, Rennes, France)

Abstract

The Bethylinidae from the Lowermost Eocene Oise amber are of crucial importance to understand the evolution of the family. This deposit occurs in a time interval that globally lacks of fossiliferous formations. This, combined to the highly fossiliferous potential of the amber, allowed to describe a transitional fauna of Bethylinidae, composed of extinct and modern taxa. We report two new genera belonging to the subfamilies Epyrinae and Mesitiinae, the latter being the first representative of its subfamily in the fossil record, and two new species belonging to the extant *Holepyris* (Epyrinae) and *Lytopsenella* (Bethylinae).

**(13:50 GMT) 15:50 Tackling the enigma of Ceraphronoidea**

Marina Moser (State Museum of Natural History Stuttgart/Stuttgart/Germany; University of Hohenheim/Stuttgart/Germany)

Abstract

Like most dark taxa within the parasitoid Hymenoptera, the superfamily Ceraphronoidea has been vastly understudied. To counteract this lack of taxonomic knowledge, the German Barcode of Life (GBOL) III: Dark Taxa project aims not only to expand the German DNA barcode reference library, but also to further the study of dark taxa such as Ceraphronoidea. Until recently, Ceraphronoidea has been remarkably resistant to COI barcoding, yielding very low success rates when processed with standard protocols. Therefore, we developed a new barcoding protocol for this superfamily. We found a highly distinctive new species in the samples of a large-scale insect monitoring scheme from southwestern Germany. The new species was barcoded using the new protocol and is currently being formally described. Additionally, I am compiling a comprehensive overview of reported host associations that will provide an insight into the vast diversity of host taxa of Ceraphronoidea.

**(14:05 GMT) 16:05 The young lady and the old man from the early Eocene – two new fossil ichneumonid species**

Alexandra Viertler (Natural History Museum/Basel/Switzerland); Seraina Klopstein (Natural History Museum/Basel/Switzerland); Corentin Jouault (Institute de Systématique, Évolution, Biodiversité, Muséum national d'Histoire naturelle, Paris, France); Tamara Spasojevic (Natural History Museum/Basel/Switzerland)

Abstract

The early Eocene seems rather fossil-poor regarding Ichneumonidae in amber and only one species, *Palaeometopius eocenicus* Menier et al., 2004, was described so far from Oise Amber from the Paris basin. Here, I would like to present *Madma oisella*, named after the french word “Mademoiselle” and *Pappous trichomatius*, translating “Grandfather with hairy eyes”, two new ichneumonid genera and species. The fossils are well-preserved and might represent stem taxa of two extant subfamilies, Tryphoninae and Phygadeuontinae. They are a highly important addition to the early Palaeogene fossil record of Ichneumonidae that otherwise mainly consists of compression fossils, which yield far less detail of the specimens’ morphology than amber pieces. Among the more than 1,000 Oise amber pieces examined, only three Ichneumonidae specimens have been found, versus about 60 Braconidae, a ratio very





different from other amber deposits. Identification of additional ichneumonid specimens from this period (lowermost Eocene) is of particular importance for a better understanding of the subfamily and species compositions of this family after the K-Pg mass extinction.

**(14:20 GMT) 16:20 Social Glands in Non-social Insects: A metapleural gland in Pelecinidae**

Jonah M. Ulmer (State Museum of Natural History Stuttgart/Stuttgart/Germany); István Mikó (University of New Hampshire/Durham/USA); Adrian Richter (Friedrich-Schiller-University/Jena/Germany); Anjel Helms (Texas A&M/College Station/USA), Thomas van de Kamp (KIT/Karlsruhe/Germany), Lars Krogmann (State Museum of Natural History Stuttgart/Stuttgart/Germany)

Abstract

For over a century, the metapleural gland, an exocrine gland above the hind coxae, has been thought to be a unique structure for ants (Hymenoptera: Formicidae), and regarded as a catalyst for the ecological and evolutionary success of the family. This gland is one of the most researched exocrine glands in arthropods and its gross morphology, fine structure, and chemistry is well documented.

An exocrine gland from the proctotrupoid wasp *Pelecinus polyturator* (Hymenoptera: Pelecinidae) has been discovered with a similar position, structure, and chemistry to the ant metapleural gland: it is located just above the hind coxa, corresponds to an externally concave and fenestrated atrium, is composed of type III gland cells, and its extract contains relatively strong acids. We also discovered that the pelecinid gland is associated with the dilator muscle of the first abdominal spiracle, a trait that is shared with ants, but remained overlooked even in recent anatomical studies possibly due to its small diameter, or its obfuscation by the extensive metapleural gland. Pelecinids and ants with metapleural glands share a close association with soil. The pelecinid metapleural gland might therefore also have an antiseptic function as suggested for ants.

**(14:35 GMT) 16:35 How dark of a taxon is Microgastrinae (Braconidae) really?**

Höcherl, Amelie (SNSB-Bavarian State Collection of Zoology/Munich/Germany)

Abstract

Entire families or subfamilies of Diptera and Hymenoptera are referred to as so-called "Dark Taxa": They are hyperdiverse, taxonomically neglected and with numerous overseen and undescribed species – even in Germany. For these groups, hardly any current identification keys exist, and often there are no taxonomic experts. In order to make these enormously species-rich groups more tangible to science, we use an integrative approach within the project GBOL III: Dark Taxa for the Microgastrinae, a subfamily of parasitoid wasps within the Braconidae (Hymenoptera) specialized in attacking Lepidoptera larvae. Specimens are selected from a large number of malaise trap samples from various habitats in Germany, with a focus on alpine habitats as well as forests, but also urban gardens. Samples are sorted and individuals selected for DNA-Barcoding by parataxonomists. Using DNA-Barcoding as a way of pre-sorting samples, we are able to identify distinct clusters and lineages that putatively represent species. Finally, representative specimens of these clusters (which correlate with BINs = Barcode Index Numbers) are morphologically verified by experts. Using this workflow allows to accelerate taxonomic work and glance at results, even with morphological identifications still in the future. We were able to identify 245 BINs within one single bulk submission of



1,898 specimens. This almost equals the number of Microgastrinae species recorded for Germany (248), and indicates that the actual species diversity must be much higher than currently known.

**(14:50 GMT) 16:50 Phylogeny, biogeography and evolution of life-history traits of Megastigmidae (Hymenoptera: Chalcidoidea)**

Julie Böhmová (Faculty of Science, Charles University, Prague, Czech Republic); Astrid Cruaud (CBGP, INRAE, Univ. Montpellier, CIRAD, IRD, Montpellier SupAgro, Montpellier, France); Jean-Yves Rasplus (CBGP, INRAE, Univ. Montpellier, CIRAD, IRD, Montpellier SupAgro, Montpellier, France); Sabine Nidelet (CBGP, INRAE, Univ. Montpellier, CIRAD, IRD, Montpellier SupAgro, Montpellier, France); Lars Krogmann (State Museum of Natural History Stuttgart, Stuttgart, Germany); Ralph S. Peters (Center of Taxonomy and Morphology; Leibniz-Institute for the Analysis of Biodiversity Change, Museum Koenig, Bonn, Germany); Kazunori Matsuo (Biosystematics Laboratory, Faculty of Social and Cultural Studies, Kyushu University, Fukuoka, Japan); Gary S. Taylor (Centre for Evolutionary Biology & Biodiversity, and School of Biological Sciences, University of Adelaide, Adelaide, Australia); Petr Janšta (Faculty of Science, Charles University, Prague, Czech Republic; State Museum of Natural History Stuttgart, Stuttgart, Germany).

Abstract

Megastigmidae comprises ca 220 species that mostly occur in the Australian region, with few genera in other biogeographic regions. Megastigmidae exhibits contrasted life-history strategies. Several genera are seed-feeders of angiosperms or gymnosperms, other are parasitoids and one genus appears to be a gall-maker. The aims of our study were to 1) produce a robust phylogeny for Megastigmidae; 2) use it to determine the area of its origin; 3) identify the ancestral feeding strategy and clarify the number of transitions between parasitic and phytophagous lifestyle. We sequenced ca 900 UCE for >100 species representing all known genera. We also sequenced numerous outgroups, including two genera of Pteromalidae, *Keirana* and *Chromeurytoma*.

Our analyses demonstrated that the circumscription of Megastigmidae should be revised to include *Keirana* and *Chromeurytoma*. Three subfamilies should be recognized within Megastigmidae: Keiraninae, Chromeurytominae and Megastigminae. The family originated in the Australian region and subsequently colonized the world. The biologies of Keiraninae is poorly known but *Chromeurytoma* is a hyperparasitoid of gall-making *Fergusonina* (Diptera: Fergusoninidae). Megastigminae is subdivided into three clades. The first comprises phytophagous species (including gall-formers). The second clade likely includes only parasitoid species. Within the third clade, the parasitic *Mangostigmus* is recovered sister to all other species, and phytophagy has evolved at least twice independently. Our analyses suggest that parasitoidism is the most likely ancestral feeding strategy of the family and of *Megastigmus* as well with subsequent shift to seed predation. From a parasitoid lifestyle, return to phytophagy has evolved at least three times independently within Megastigmidae.



**(15:05 GMT) 17:05 Sexual dimorphism in Ichneumoninae and the neglected influence of the ecological niche**

Bernardo F. Santos (Muséum national d'histoire naturelle, Paris, France); Adrien Mathou (Muséum national d'histoire naturelle, Paris, France); Uriell Quentel (University of Paris 1: Pantheon Sorbonne, Paris, France); David Wahl (Utah state university, Logan/United states); Adrien Perrard (iEES, Paris, France)

Abstract

Our study aims to quantify sexual dimorphism in a hyper-diverse family of parasitoid wasps, the Ichneumonidae. We measured the differences in shape for the head and mesosoma among males and females in 21 species of the subfamily Ichneumoninae by using several landmarks and geometric morphometrics analysis in R. We found that many species show a significant degree of dimorphism, which showed little phylogenetic signal. These results suggest that this dimorphism could be modulated by other factors than the sexual selection and the phylogenetic proximity. Those factors could be evolutionary convergences related to the type of host exploited by the female (pupa or larva). This assumption is underlined by a divergence in mean shape between species parasitizing larvae and those parasitizing pupae. Phylogenetic comparative methods suggest that sexual dimorphism in Ichneumonidae could be highly influenced by the ecological niche of individuals (reproductive strategy).

**(15:20 GMT) 17:20 Understanding the Immune pathways and Common Diseases in Red Mason Bees**

Fiona Tainsh (University of Warwick, Coventry, UK); David Chandler (University of Warwick, Coventry, UK)

Abstract

We are facing a food security and biodiversity crisis, both of which require us to assess and change agricultural practices. The current practice in agriculture for pollination is using both bumblebee and honeybees to boost crop pollination. There is potential to improve on this practice, from both from an agricultural and biodiversity standpoint, with evidence showing the presence of wild bees at site where honeybees are present increases pollination levels— increasing both crop yield, health and shelf life. The solitary bee, the red mason bee (*Osmia bicornis/Osmia rufa*) is used on a small scale for commercial pollination in orchards and soft fruit. Populations are outdoors using artificial nesting boxes. The cocoons are then collected at the end of the season and stored over winter, allowing them to be introduced into the crop the following spring. Red mason bees are extremely effective pollinators and have a small range. Their use in agriculture has the potential to reduce the number of honeybee and bumblebees required in an area, reducing the impact on surrounding bee biodiversity. However, current attempts to use red mason bees in agriculture have seen a high level of disease due to the lack of knowledge surrounding their common pathogens and the red mason bee immune pathways. Here we examine the immune pathways in the red mason bee genome as well as developing a framework for disease identification in hopes to further inform the efforts being made to introduce solitary bees to agriculture. Results will be shared during the presentation.





(15:45 GMT) 17:45 **KEYNOTE PRESENTATION: Consequences of competitive interactions between parasitoids for biological control**

Dr. Tim Haye (CABI-Europe Switzerland Centre, Switzerland)

I got interested in parasitoids back in 1998 when I started working as summer student at the Swiss CABI center in Delémont, where I completed my undergraduate degree on the biological control of lily leaf beetle. I continued in this area and during my PhD at the University of Kiel I focused on biological control of plant bugs in North America what gave me the opportunity to work at the AAFC centers in Ottawa and London. In 2014 I moved to Switzerland where I am now leading the Arthropod Biological Control program. My group is working on classical biological control of insect pests in Europe and North America with particular emphasis on host-range assessment, non-target impacts and the ecology of parasitoids. More recently, I started working on the impact of climate change on agricultural pests and their natural enemies and since 2015 I am a member of the Swiss Expert Committee for Biosafety.



**Collecting Darwin wasps in stream.** Photograph by Kazuhiko Konishi  
Sapporo, Hokkaido, Japan in August, 2013. Konishi is searching caddis cases parasitized by *Agriotypus gracilis*.



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## Welcome to Hymathon BINGO, where socializing is less awkward!

**Goal:** Get Bingo by making any line (Horizontal, Vertical or Diagonal) by crossing off squares.

**Game Rules:** During the game, pick your card based on your taxonomic group of interest, or anyone you like. You will be shunted off to rooms with 3-4 people. Each person will take a turn. When it is your turn, pick a square on your bingo card (not free space) and ask who has done that item. For example, if you choose, “got lost in the field,” ask everyone “who has been lost in the field?” (as in during field work), and everyone who has been lost in the field can digitally raise their hand. Then, the person whose turn it is will pick one person, with their hand raised, to tell the story of this incident. Please keep the stories brief, 2 minutes or less. If the story gets long, other participants should start making emoji’s to let them know to speed it up. Once the story is told, the next person takes their turn (pick any order – alphabetical by first name works).

**Simply put:** Each person will get to choose only one thing on their bingo card to ask and pick only one person out of the group to tell the story (if there are multiples) - then it moves onto the next person. If no-one has done that specific thing, then no-one gets to cross the square off, but it still goes to the next person to pick a square on their card.

**Notes:** There will only be 6 minutes per room (5 minutes with a 60 second close warning, so try and get through everyone to have a turn. After the first room closes, everyone will be shunted to a new room with new people. This will continue until a BINGO has occurred.

**Marking your bingo squares:** Everyone in the room gets to mark the appropriate square if it appears on their card **as long as at least one person had raised their hand in response to the question** (in other words, they had that event happen to them). If no person in the breakout room had the event happen, then no-one gets to mark a square, and the next person takes their turn.

**BINGO:** If you have marked enough squares to create one line, you have bingo. The first person to return to the main room and yells bingo WINS! The host will ask who told the stories to confirm your bingo. Once confirmed, the breakout rooms will be killed with 60 seconds notice. When we are all back, the winner will tell the most interesting story they heard (with consent from the original story teller). The host will also ask for one or two other interesting stories people heard or told to share with the larger group.



(GMT)

**local**



Ichneumonoidea

<b>B</b>	<b>I</b>	<b>N</b>	<b>G</b>	<b>O</b>
Made an insect meme	Broke a type specimen	Have held a loan > 5 years	Contaminated a PCR sample	Had one of your described species invalidated
Misplaced specimen labels	Returned to a destroyed malaise trap	Accidentally killed a lab colony	Broke a sweep net	Got lost in the field
Got caught eating/drinking in lab	Ran out of ethanol	<b>Free Space</b>	Had a work-related bathroom incident	Forgot a deadline
Sprained or broke a bone in the field	Had a "dung" incident	Lost specimen "fly away" (during pin, extraction, etc)	Requested authors cite your work as a reviewer	Failed to amplify a rare taxon
Got stung in the field	Used duct tape in an interesting way	Failed to obtain a collecting permit	inhaled insect during aspiration	forgot your malaise trap sample somewhere

Symphyta

<b>B</b>	<b>I</b>	<b>N</b>	<b>G</b>	<b>O</b>
Forgot a deadline	Have danced with colleagues	Missed a flight	Got caught eating/drinking in lab	Misplaced specimen labels
Requested authors cite your work as a reviewer	Contaminated a PCR sample	Have held a loan > 5 years	hidden or ran from biting insects	used a machete
Returned to a destroyed malaise trap	Lost specimen "fly away" (during pin, extraction, etc)	<b>Free Space</b>	embarrassed yourself in the lab	Broke a sweep net
inhaled insect during aspiration	found an engorged tick in a strange place	crushed a slide under the microscope	used your own dung to trap	Have held a loan > 5 years
Got caught eating/drinking in lab	Failed to amplify a rare taxon	Got lost in the field	Got stung by a 4 on Schmidt index (Pepsis, bullet ant)	Broke a type specimen

## Aculeata

<b>B</b>	<b>I</b>	<b>N</b>	<b>G</b>	<b>O</b>
Made a species checklist	Broke a type specimen	Made a video about insects	Contaminated a PCR sample	Had one of your described species invalidated
Forgot a deadline	Returned to a destroyed malaise trap	Misplaced specimen labels	Broke a sweep net	Got lost in the field
Got caught eating/drinking in lab	Ran out of ethanol	<b>Free Space</b>	Got scared in the field over something silly	Lost specimen "fly away" (during pin, extraction, etc)
Sprained or broke a bone in the field	Requested authors cite your work as a reviewer	Got a vehicle stuck in the field	Got stung in the field	Failed to amplify a rare taxon
Made an insect meme	Used duct tape in an interesting way	forgot your malaise trap sample somewhere	inhaled insect during aspiration	Had a "dung" incident

## Chalcidoidea

<b>B</b>	<b>I</b>	<b>N</b>	<b>G</b>	<b>O</b>
Broke a type specimen	Have sang with colleagues	Missed a flight	Got caught eating/drinking in lab	Misplaced specimen labels
inhaled insect during aspiration	Forgot a deadline	crushed a slide under the microscope	Contaminated a PCR sample	used a machete
hidden or ran from biting insects	Lost specimen "fly away" (during pin, extraction, etc)	<b>Free Space</b>	embarrassed yourself in the lab	Returned to a destroyed malaise trap
Played a prank on a colleague or advisor	Have held a loan > 5 years	found an engorged tick in a strange place	Made a video about insects	Have held a loan > 5 years
Got caught eating/drinking in lab	Failed to amplify a rare taxon	Got lost in the field	Got stung by a 4 on Schmidt index (Pepsis, bullet ant)	Broke a sweep net

Cynipoidea, Evanioidea, and small families

<b>B</b>	<b>I</b>	<b>N</b>	<b>G</b>	<b>O</b>
Had a time where you chickened out	Broke a type specimen	Have held a loan > 5 years	Contaminated a PCR sample	Lost a student in the field
Found a rare taxon on a dedicated search	Returned to a destroyed malaise trap	Misplaced specimen labels	Broke a sweep net	Named a species after a parent/sibling
Got caught eating/drinking in lab	Won a photo competition	<b>Free Space</b>	Pulled a prank on a colleague or advisor	Lost specimen "fly away" (during pin, extraction, etc)
Made an insect meme	Have played a game with colleagues (not this one)	Had a car accident in the field	Got stung in the field	Forgot a deadline
Accidentally killed a lab colony	Used duct tape in an interesting way	forgot your malaise trap sample somewhere	inhaled insect during aspiration	Had a "dung" incident

Proctotrupoidea, Lab rats & lover of all Hymenoptera

<b>B</b>	<b>I</b>	<b>N</b>	<b>G</b>	<b>O</b>
Made a solution wrong	Started an unintended fire	Missed a flight	Got caught eating/drinking in lab	Misplaced specimen labels
inhaled insect during aspiration	Forgot a deadline	Have sang with colleagues	Contaminated a PCR sample	Been in a cloud forest
hidden or ran from biting insects	Broke a type specimen	<b>Free Space</b>	Cried in the field	Have a social media post you wish you could recall
Reviewed a paper non-anonymously	Have held a loan > 10 years	found an engorged tick in a strange place	Have held a loan > 5 years	Lost specimen "fly away" (during pin, extraction, etc)
Got caught eating/drinking in lab	Failed to amplify a rare taxon	Got lost in the field	Have a terrible story about ants	Broke a sweep net