



NEWSLETTER # 10

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April 2017



Ancient social ants fossilized in Cretaceous-age Burmese amber.
Photo: AMNH Grimaldi & Barden

Greetings,

Welcome to the 2017 edition, replete with award winners, new comers, dispersers, news and views askew. This issue canvases Tim Heard's award winning book, profiles investigations by Toshihisa Yashiro, Amanda Norton, Perry Beasley-Hall, Rebecca Dew, Emily Remnant and gives the inside running on some Australasian social insect research groups. Followed by some broader contemplation on insect amber fossils.

We would like to advise you that there is an 'intent' to hold the Australasian Section AGM in conjunction with the *Australasian Evolution Society* meeting (Hobart in November 2017) and that the *XVIII IUSSI International Congress* is confirmed for Guarujá, São Paulo, Brazil in August 2018 - only 15 months away!

To maintain a functional society and provide awards to students within our region it is imperative that all of us continue to encourage colleagues to become and remain members of the Australasian section. In a similar vein, you are also encouraged to support the society's journal *Insectes Sociaux*, by submitting suitable articles when appropriate – see page 3 to learn of the benefits in doing so. One can also keep up with IUSSI news throughout the year by plugging in to the social media matrix listed below: wordpress | twitter | facebook.

On behalf of the Australasian Section Officers, we collectively thank you for your continued support and wish you well for the coming year.

Regards,

Simon

Australasian Section Secretary - IUSSI
simon.tierney@adelaide.edu.au



<https://insectessociaux.com>

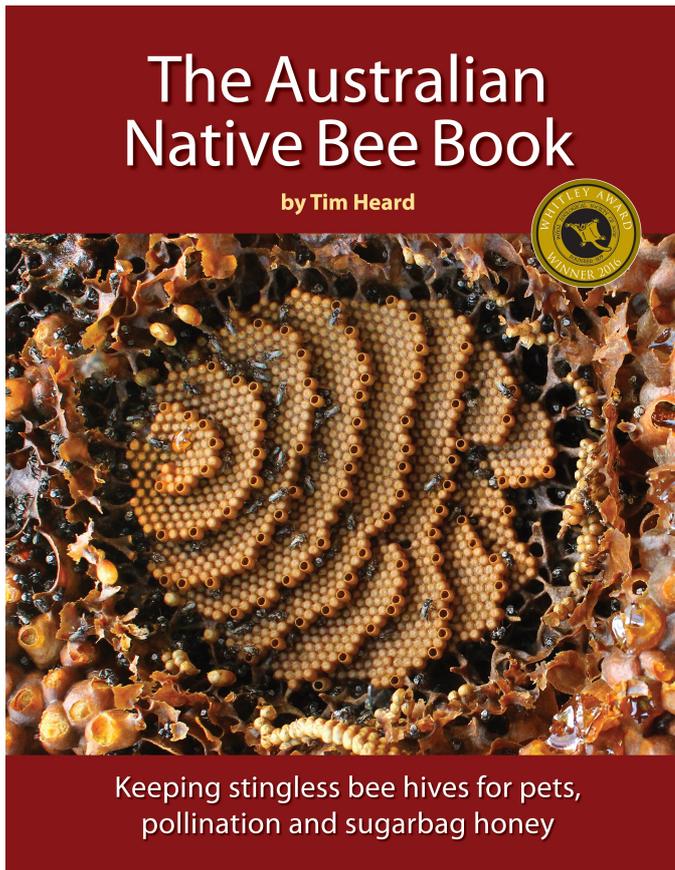


<https://twitter.com/inssociaux>



<https://www.facebook.com/InsectesSociaux?ref=bookmarks>

Heard's Award Winning Bee Book



The Australian Native Bee Book, already winner of a 2016 *Whitley Award*, has just been longlisted for the Small Publishers' Adult Book of the Year for the 2017 *Australian Book Industry Awards*:
<http://abiawards.com.au/>

The winning of a *Whitley Award* injected a dose of scientific credibility. The *Whitleys* are awarded annually by the *Royal Zoological Society of New South Wales*, for outstanding publications that contain new information about the fauna of the Australasian region.

The *ABIAs* celebrate Australian stories and the astounding talent in the Australian publishing industry. Hopefully a book about social insects will make it to the shortlist to be revealed on April 9, with the winners announced during the *ABIA* gala event on May 25.

A complete and richly illustrated guide to keeping stingless bee hives, ISBN 978-0-646-93997-1

Published by Sugarbag Bees 2016

<http://www.nativebeebook.com.au>

New Section Website Address

<https://www.iussiaustralasia.org>

Please note that this is still a work in progress... we hope to return to full functionality in the near future

Membership Subscriptions

If you have not done so already, please take action and subscribe. Save yourselves future hassle by subscribing for up to five years in advance.

Contact Treasurer Nathan Lo for payment details:
nathan.lo@sydney.edu.au

2016 AGM



In the grotto: Treasurer Nate Lo, Presidente Simon Robson and Secretary Simon Tierney. Thanks to the obscuring finger of *Katja Hogendoorn Photography*.

It wasn't all beer and skittles at the 2016 AGM, but it was close. Members in attendance were witness to discussions on matters that are largely canvassed in the current newsletter. The **Student Travel Award** went to the highly deserving **Isobel Ronai** (University of Sydney) and there was a groundswell of support for more formalised annual gatherings in conjunction with regional conferences. To this end, it was loosely agreed that a **2017 AGM** will be held in parallel with the **Australasian Evolution Society** meeting in Hobart during November of this year – dates and details will be relayed to members when they become available.

2018 International Congress



International Union for the Study of Social Insects (Iussi 2018), August 5-10, 2018 in Guarujá, Brazil. The website for the congress is now live:
<http://www.iussi2018.com>

Ben Oldroyd will be one of the plenary speakers.

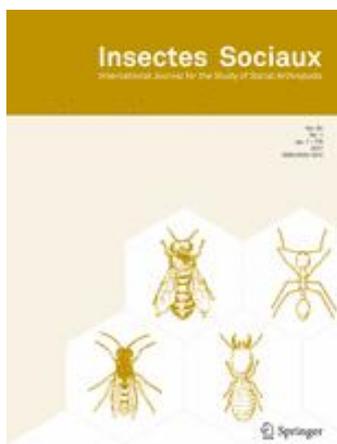
Rebranded: Girt by Sea

Finally, a final version of the new Section Logo:



Huge thanks to **Luke Chenoweth** (SA Museum) for enduring several requests for post-award modifications. Looks good, no? Girt by sea...get it?

Insectes Sociaux



<http://link.springer.com/journal/40>

Editor in Chief Mike Breed would like to encourage you to submit to *Insectes Sociaux*. Aside from research articles, the journal is always looking for review articles, especially from PhD candidates, and the IUSSI awards cash awards for them!

For example, last year **Rebecca Dew** (Flinders University) published a review paper from her thesis on the *evolution of casteless societies* (Dew *et al.* 2016) and earlier this year **Michael Holmes** (University of Sydney) expounded upon the *parasitic strategies of honey bee workers* (Holmes & Beekman 2017). Ask them to buy you a drink because they are internationally published authors and cashed up.

Dew RD, Tierney SM & Schwarz MP. 2016. Social evolution and casteless societies: needs for new terminology and a new evolutionary focus. *Insectes Sociaux* 63: 5-14.

<http://link.springer.com/article/10.1007/s00040-015-0435-1>

Holmes MJ & Beekman M. 2017. When does cheating pay? Worker reproductive parasitism in honeybees. *Insectes Sociaux* 64: 5-17.

<https://link.springer.com/article/10.1007/s00040-016-0515-x>

Introducing New IUSSI Members



Dr Toshihisa Yashiro has joined the *Molecular Phylogenetics, Ecology, and Evolution* (MEEP) Laboratory at The University of Sydney. Toshi holds a JSPS (*Japan Society for the Promotion of Science*) Postdoctoral Research Fellowship from 2017-2019. His research focusses on breeding systems and taxonomy of termites. He is also interested in the ecology and taxonomy of various groups of insects. Toshi was previously a postdoctoral researcher at Kyoto University, Japan, in Prof. Kenji Matsuura's lab. Toshi's website is here:

<http://sydney.edu.au/science/biology/meep/people/toshihisa-yashiro.shtml>



Amanda Norton started her PhD in March 2017 at the University of Sydney (*Behaviour and Genetics of Social Insects Laboratory*), supervised by Professor Madeleine Beekman and Dr Emily Remnant. Her PhD project is supported by an ARC Discovery grant (2017-2019: '*What is killing the honeybees? The role of RNA viruses in the death of honeybee colonies*') and will

investigate the relationship between the Western honeybee (*Apis mellifera*), RNA viruses and the ectoparasitic mite *Varroa destructor*.

Outside of Australia, many millions of managed and wild honey bee colonies have died globally over the past 50 years. One major factor attributed to these deaths is the worldwide spread of *V. destructor* and subsequent RNA viral infections, of which the mite is a known vector. Female mites feed on the bees' haemolymph, facilitating horizontal transmission of viruses. **Deformed Wing Virus (DWV)** is currently considered to be the most significant honeybee viruses worldwide. Previous studies indicate that viral titres and virulence are correlated with increased exposure to *V. destructor*, which suggests that the mite selects for increased virulence. Concurrently, there are rare and isolated reports of honeybee colonies resistant to *V. destructor* infestation.

Australia is currently the only major beekeeping country to be free of both *V. destructor* and DWV; however, authors have postulated that the introduction of *V. destructor* into Australia is inevitable. Therefore, the overall aim of my project is to further elucidate the relationship between the two threats, and uncover what effect vector transmission has on DWV virulence and mechanisms of resistance in honeybees. This will be achieved with a combination of experimental and molecular techniques. Furthermore, my project aims to determine what effect *V. destructor* and DWV will have upon Australia's naïve honeybees and contribute knowledge to a honeybee continuity strategy, should *V. destructor* and DWV become established in Australia.

Amanda's research background is in chemical ecology and she has been fascinated with honeybees since childhood. She undertook a BSc. at University of the Sunshine Coast (USC) and as an undergraduate worked with Dr Peter Brooks in developing a novel method to quantitate active compounds in Australian *Leptospermum* nectar, to determine which plant species will produce honeys with non-peroxide antibacterial activity. Amanda's interest in honeybee host-pathogen interactions was initiated during her Honours research project. I investigated the chemical properties and repellent effects of *Corymbia torelliana* (*Cadaghi*) fruit resin, utilised by Australian stingless bees, on a honeybee pest (small hive beetle; *Aethina tumida*) and parasite (*V. destructor*) under the supervision of Professor Helen Wallace (USC), Dr Peter Brooks (USC) and Dr Sara Leonhardt (University of Würzburg).

Perry Beasley-Hall has recently busted out of her Adelaidean-chrysalis, overcome her affliction for non-social insects and metamorphosed into a PhD student in the *Molecular Ecology, Evolution, and Phylogenetics lab* - supervised by Nathan Lo and Simon Ho. Perry's project focuses on the evolution and systematics of giant cockroaches (Blaberidae: Panesthiinae, Geoscapheinae), many of which practice parental care, and one of these species is the heaviest roach in the world!



Macropanesthia rhinoceros heavy and parental

This Australian group of insects are suspected to have made multiple independent transitions from residing in logs to burrowing into the soil as a result of ancient aridification. If the environmental cause and the behavioural outcome are understood, the next step is to ask what sort of genetic mechanisms are behind these transitions. What's happening in between? It may be the case that certain genes are more susceptible to events of parallel evolution than others, which implies there's a restricted suite of molecular solutions these roaches have at their disposal to deal with a given problem. Is evolution completely stochastic, or is there a degree of predictability here? Transcriptome data and the whole genomes of symbionts that live in the cockroaches' fat bodies will enable Perry to address such questions. Her project also seeks to address the systematics of these cockroaches. Neither subfamily forms a natural group and, in many cases, specimens thought to be the same species emerge in very disparate regions of the current phylogenetic trees. Perry will sequencing entire mitochondrial genomes to resolve these issues.



Perry Beasley-Hall looks forward to meeting other IUSSI members in 2017 and into the future.

Dispersals



Rebecca Dew has recently submitted her PhD thesis and prior to this was awarded an **Endeavour Queen Elizabeth II Diamond Jubilee Fellowship** to characterise the microbiome of *Ceratina calcarata*.



Rebecca Dew *in situ*

Beck aims to characterise the 'healthy' microbiome of this small carpenter bee species and will sample *C. calcarata* throughout its range in the United States to highlight changes in diversity and microbial composition in varying climates and ecosystems. A secondary aim is to identify essential microbes to gain insights into bee health and disease resistance. She will undertake research within **Sandra Rehan's** lab at the University of New Hampshire:

<http://www.unhbeelab.com>



Ceratina calcarata immortalised in film by Laurence Packer

Frontline



Social insect research continues at **James Cook University** despite the cyclone season. Within the **Robson Behavioral Ecology lab** in Townsville, the final manuscript from **Sara Nowrouzi's** PhD thesis looking at thermal limitations as drivers of elevational distribution patterns is submitted and under review and Sara is looking forward to a post-PhD life.



Lochlan Jones being a scientist

Lochlan Jones has commenced a BSc Advance project examining the numerous ant-mimics found in Townsville. **Irwan Livadi** is enjoying identifying the social insects that have fallen prey to *Drosera* (as part of his PhD project on the foraging ecology of carnivorous plants).



Irwan Livadi gets down with *Drosera*

Tobin Northfield (JCU Cairns campus) has delivered another excellent two-week Entomology intensive course, including a one-week field trip to the **Daintree Rainforest Observatory** <https://research.jcu.edu.au/dro>

As expected, student collections included an excellent array of social insects which continue to build the collections at this facility. **Samantha Forbes**, an MSc student with Tobin, has recently published two papers demonstrating the role of *Oecophylla smaragdina* in biological control on cacao farms, showing these ants do not inhibit pollination success.



THE UNIVERSITY OF
WESTERN AUSTRALIA



Sam Forbes cradles cacao

Forbes SJ & Northfield TD. 2017. *Oecophylla smaragdina* ants provide pest control in Australian cacao. *Biotropica* doi:10.1111/btp.12405
<http://onlinelibrary.wiley.com/doi/10.1111/btp.12405/full#references>

Forbes SJ & Northfield TD. 2017. Increased pollinator habitat enhances cacao fruit set and predator conservation. *Ecological Applications* doi:10.1002/eap.1491
<http://onlinelibrary.wiley.com/doi/10.1002/eap.1491/abstract>



Yellow crazy ants *Anoplolepis gracilipes*. Photo: Johan Larson

Lori Lach (JCU Cairns) was the preferred bidder for the **Wet Tropics Management Authority Yellow Crazy Ant Eradication Program** – a two year research contract to research reproductive phenology, bait efficacy, and detection methods of *Anoplolepis gracilipes*.

All four of Lori's students have recently been awarded independent research grants. **Dylan Case** (Honours) will be conducting the first rigorous study of the effects of yellow crazy ants on skinks and **Rankin Salinas** (MSc) is testing whether the presence of yellow crazy ant queens affects foraging behaviour. **Mel Greenfield** (PhD) is investigating the role of fungi in the ant-plant, *Myrmecodia beccarii* and **Pauline Lenancker** continues her PhD work on tropical fire ants *Solenopsis geminata* in collaboration with CSIRO (Darwin & Black Mountain), Pauline is using field experiments and next-gen sequencing to understand colony founding dynamics and is currently in Darwin conducting field work.

Peter Yeeles (PhD candidate) recently had his first thesis chapter accepted for publication in which ants feature prominently:

Yeeles P, Lach L, Hobbs RJ, van Wees M & Didham RK. 2017. Woody plant richness does not influence invertebrate community reassembly trajectories in a tree diversity experiment. *Ecology* 98: 500-511.
<http://onlinelibrary.wiley.com/doi/10.1002/ecy.1662/abstract>

2017/18 Meetings

Genetics Society of Australasia / New Zealand Society for Biochemistry & Molecular Biology
Dunedin NZ, 2-6 July 2017
<http://gen2017.w.events4you.currinda.com>

Australasian Society for the Study of Animal Behaviour
Mooroolbark VIC, 19-22nd July 2017
<http://www.assab.org>

Andean-Caribbean Section IUSSI – XI Colloquium
Tarapoto, San Martin, Peru, 7-11 August 2017
[see flyer below for more details](#)

Australian Centre for Biodiversity Analysis
Black Mountain ACT, 12-14 September 2017
<http://cba.anu.edu.au/news-events/genomics-and-collections-adaptation-macroevolution>

Australian Entomological Society, Terrigal NSW,
17-20 September 2017
<http://www.aesconferences.com.au>

International Conference in Zoological Sciences & 11th ANeT (International Conference on Ants)
Patiala India, 26-28 October, 2017
<http://www.conferencezoologyants.com/welcome>

Society of Australian Systematic Biologists / Australasian Systematic Botany Society
Adelaide, 26–29 November 2017
<https://systematics.ourplants.org>

Ecological Society of Australia / New Zealand Ecological Society
Hunter Valley NSW, 26 Nov - 1 Dec 2017
<http://ecotas2017.org.au>

Society for Integrative and Comparative Biology
San Francisco CA, USA, 3-7 January 2018
<http://www.sicb.org/meetings/2018/symposia/index.php>

International Union for the Study of Social Insects
Guarujá SP, Brazil, 5-10 August 2018.
<http://www.iussi2018.com>

International Society for Behavioral Ecology
Minneapolis MN, USA, 2018 dates t.b.a.
<http://www.behavecol.com/meetings-conferences/>

Awards and Opportunities for Early Career Researchers

Story by: **Emily Remnant** - The University of Sydney.



Science and Innovation Awards: Receiving my awards with Senator Anne Ruston Assistant Minister for Agriculture and Water Resources. (Photo: Twitter)

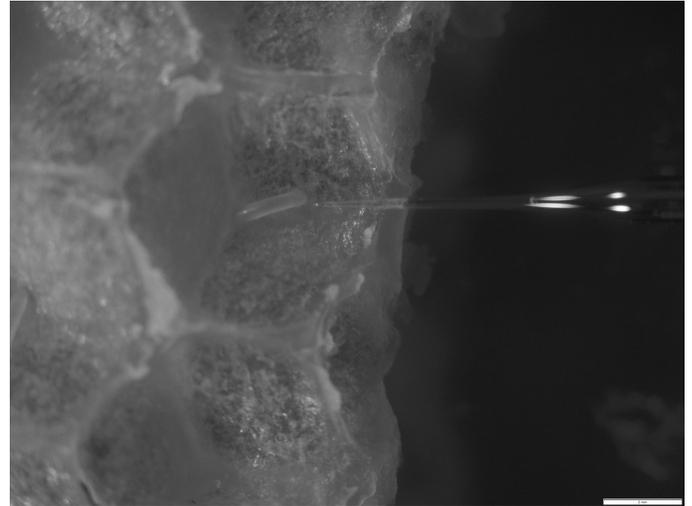
Are you a PhD student or Postdoctoral Researcher looking to broaden your horizons and initiate research into an innovative new area? I'd like to let you know about a couple of opportunities that I have recently experienced, which are available for Early Career Researchers to fund their next research adventure.

I'm a Postdoctoral Research Associate in the Behaviour and Genetics Lab, School of Life and Environmental Sciences at the University of Sydney, working with Prof Madeleine Beekman. In my current research, I focus on understanding host-parasite interactions between honey bees, *Varroa* mites and the viruses that they spread. My research extends to investigating new methods to protect the Australian honey bee industry from pathogens. Most current strategies to improve honey bee health focus on eliminating *Varroa* mites, but if viruses are actually the main culprits that are causing colony death, I wondered- is there a way to specifically reduce virus levels in bees?

This idea forms the basis of my new research agenda, investigating viral protection mechanisms in honey bees. The aim is to make bees more resilient to viruses by 'immunising' them with a symbiotic bacterium that is found in almost half of all insects, *Wolbachia pipientis*. *Wolbachia* is effective in providing virus resistance in flies and mosquitoes, and is currently used to prevent the spread of mosquito-borne human diseases like Dengue fever and Zika virus. My goal is to determine whether *Wolbachia* can provide protection against viruses in honey bees.

I have recently received two grants that have enabled me to begin investigating the effects of novel *Wolbachia* associations on virus protection in bees. I received an **Endeavour Research Fellowship** from the Department of Education and Training, where I spent 6-months at the *University of Otago* working with Prof Peter Dearden. Here, I learnt a specialised technique to refine a rapid and efficient system for microinjecting honey bee eggs, a method I will now use to transfect

honeybees with the *Wolbachia* endosymbiont. While in New Zealand I formed a collaboration with Prof Phil Lester, Jessica Russell and James Baty at the *Victoria University of Wellington*, where we will continue to work on optimising *Wolbachia* transfection techniques. In March this year, I also received **Science and Innovation Award** from the *Department of Agriculture and Water Resources*, and the Minister's prize for my project "Can we immunise honey bees against virulent viruses?". These awards have provided me with funding to purchase equipment and laboratory reagents to set up my *Wolbachia* experiments in Sydney.



Microinjecting honey bee eggs

The **Australia Awards Endeavour Fellowships** are 6-month research fellowships, available for Australians to undertake research or professional development overseas, and for overseas citizens to do the same in Australia. These are a great opportunity to develop your research career, learn new techniques, experience a different environment and form new collaborations. Applications for the 2018 round are now open: <https://internationaleducation.gov.au/Endeavour%20program/Scholarships-and-Fellowships/Pages/default.aspx>

The **Department of Agriculture and Water Resources and ABARES Science and Innovation Awards** are open to young scientists under the age of 35, and recognise big ideas that have the potential to make an impact on Australia's agricultural system. <http://www.agriculture.gov.au/abares/conferences-events/scienceawards>

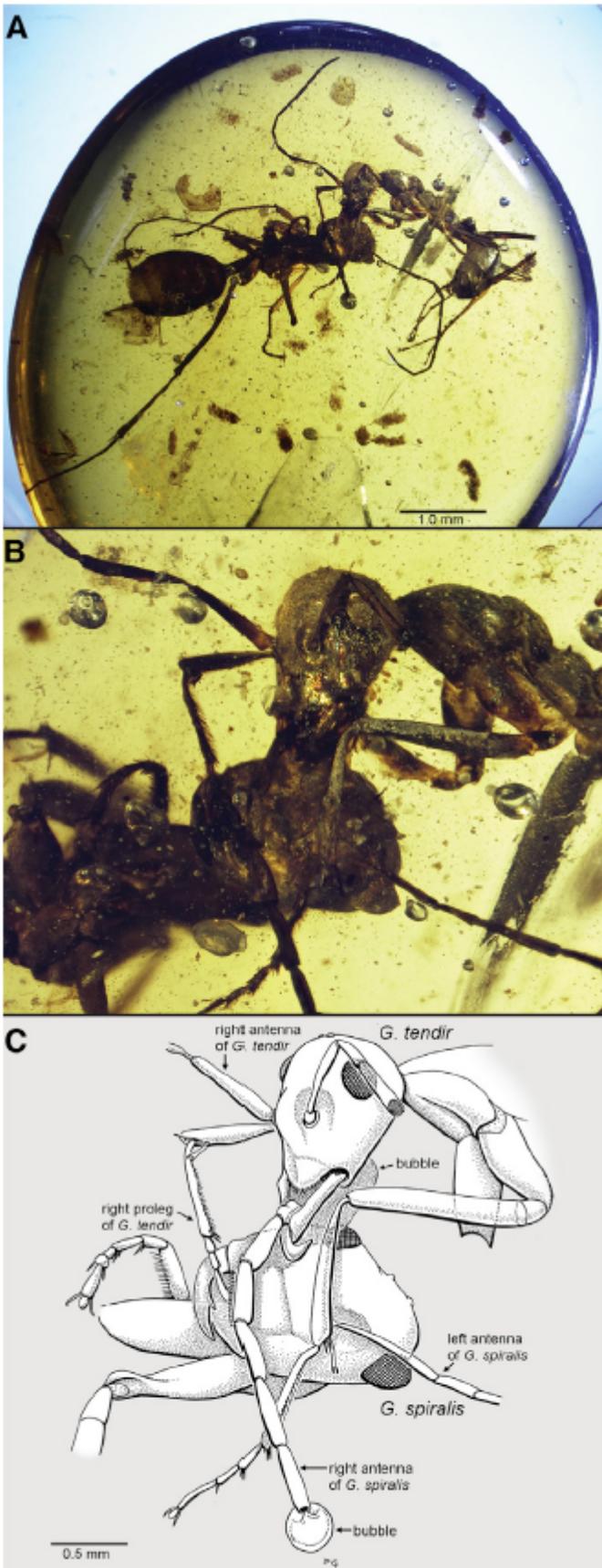


See related **ABC Rural** story by Anna Vidot:

Australian researcher working to immunise honey bees, protect them from varroa mite

<http://www.abc.net.au/news/rural/2017-03-10/researcher-immunising-honey-bees-to-guard-against-varroa-mite/8342172>

Art vs Science



Workers of two species of *Gerontofornica* in Burmese amber, *G. tendir* and *G. spiralis*, captured while fighting.

(A) Photomicrograph of entire specimens.

(B) Photomicrographic detail of interaction.

(C) Illustration clarifying positions of appendages.

Barden & Grimaldi (2016) *Current Biology* 26: 515–521
[http://www.cell.com/current-biology/fulltext/S0960-9822\(16\)00041-5](http://www.cell.com/current-biology/fulltext/S0960-9822(16)00041-5)

Forever Amber

Art, Science and Historic Lore Intersect Exquisitely in Gems of Ancient Resin

TIME MAGAZINE

<http://content.time.com/time/magazine/article/0,9171,984094,00.html>

By Michael D. Lemonick

Monday, Feb. 12, 1996

The Etruscans prized it as highly as gold. The Greeks mythologized it as the tears of Apollo's daughters, solidified when they cried for their dead brother Phaeton. The Romans considered a single piece worth more than a slave. Cultures stretching from Central America to the Far East, from the Mediterranean to Scandinavia, have used it both as a powerful medicine and as a medium for exquisite jewelry and works of fine art.

Scientists, too, value amber. Trapped within the translucent, usually gold-colored substance are some of the most ancient examples of certain species known to science. The oldest ants, moths, stingless bees, caterpillars, termites, mushrooms and pollen grains, some of them dating back tens of millions of years, have been found in amber. And unlike ordinary fossils, which are relatively crude rock molds of prehistoric life forms, these specimens are often perfectly preserved, with the most delicate features intact.

Now entomologist David Grimaldi of New York City's American Museum of Natural History has announced a find he calls "scientifically the most important of all amber fossils." It's three tiny flowers, probably from an oak tree, that date to the age of the dinosaurs, some 90 million years ago. That makes them the oldest intact flowers ever found in amber, and an important clue to the origin of the flowering plants that now dominate the earth.

Amber's dual roles as artistic medium and scientific research tool have rarely intersected. But that's just what they'll do starting later this week. On Saturday the American Museum will unveil, under Grimaldi's curatorial supervision, the most comprehensive display of amber ever mounted. The exhibition, "Amber: Window to the Past," features 146 fossil specimens and 94 decorative objects from museums and private collections all over the world, including Stone Age amulets from Scandinavia, 18th and 19th century Chinese figurines and treasures once owned by the Medicis of Italy and the Czars of Russia. Many of these artworks have never been publicly shown.

Not bad for a substance that's essentially dried-up tree resin. The viscous stuff that eventually turns into amber comes from a variety of ancient trees, mostly conifers, including pines and extinct relatives of sequoias and cedars, but also some deciduous trees. It probably evolved, says Grimaldi, as a defense against wood-boring insects. "As it dripped down the bark," he explains, "it acted like flypaper and encapsulated them, hermetically sealing the trees' wounds at the same time".

Eventually the trees and their stalactites of dried resin fell, some of them ending up buried in soft sediments at the bottom of still and shallow bodies of water. There, over millions of years, the molecules of

resin gradually amalgamated into long, durable chains, creating a material remarkably like plastic: airtight, watertight, chemically inert.

Although wood-boring insects might have been its target, the resin would also trap anything else that happened to stumble into it, including small lizards and frogs. Bad luck for them, but extraordinary good fortune for evolutionary biologists. In one major deposit--a site in New Jersey whose location is closely guarded--Grimaldi and a team of volunteers have found nearly 100 previously unknown ancient species of plants and animals. These and other discoveries around the world have given scientists some important insights into the workings of natural selection--how, for example, insects and flowers helped guide each other's evolution.

Other samples provide dramatic snapshots of prehistoric behavior: mites hitchhiking on the back of sweat bees; a leaf beetle spitting out a stream of noxious bubbles in self-defense; spiders caught in the act of mating; a praying mantis attacked by ants; a spider finishing off a millipede.

As anybody who has seen Jurassic Park knows, plants and animals sealed in amber are a potential source of prehistoric DNA. Scientists have extracted genetic material from, among other things, a 17 million-year-old magnolia leaf, a 30 million-year-old termite and a 120 million-year-old weevil. Yet no serious biologist believes it will ever be possible to clone a dinosaur from a few bits of DNA. Even so excellent a preservative as amber apparently can't keep DNA from breaking down into fragments that may be scientifically interesting but are biologically inert. That's one reason many researchers doubt the claims of California scientists who announced last year that they had managed to revive bacteria preserved in amber for 25 million years.

For scientists, a piece of amber with nothing trapped inside is not so exciting. For artists and their patrons, however, it is an uncut gem. According to Grimaldi, Stone Age artisans used amber found on beaches of the Baltic Sea 10,000 years ago to carve amulets, pendants and tiny figurines. Indeed, Baltic deposits were Western civilization's primary source of amber at least as far back as 1200 B.C.

The name notwithstanding, amber isn't always amber in color. It can also be milky white, red and even blue or green--more than 250 different shades in all, say researchers--and artists have used just about every one of them.

Because it sometimes contains dead animals, amber was strongly associated with death in ancient times. "It was believed to serve as a ray of light for the dead person in the afterlife," says Faya Causey, a historian of ancient art at the National Gallery of Art in Washington. Many of the amber figurines carved during the classical period relate either to death or to fertility and rejuvenation. Amber may have been used by Egyptians in the mummification process, possibly because it is a powerful desiccant, or drying agent. It was also valued as a medicine. According to Pliny the Elder, Roman peasants used it to cure diseases of the neck and head. In the New World, the Maya burned it as incense to treat a variety of ailments.

By the time of the Renaissance, the Western world had largely abandoned the mystical and medicinal uses

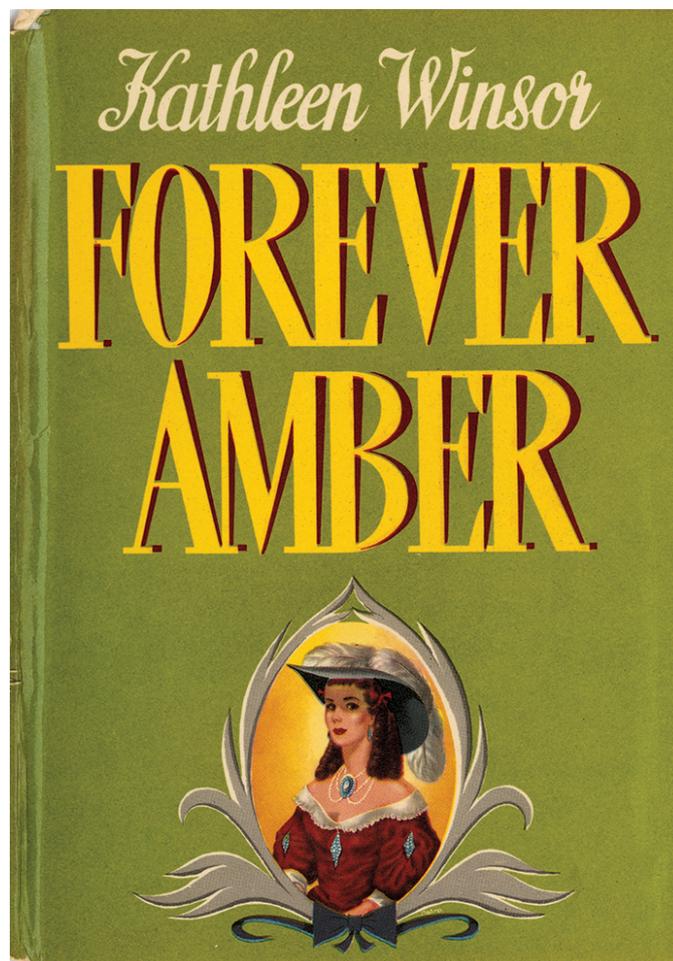
of amber. But the great amber deposits of the Baltic still had plenty of business: guilds of craftsmen produced an enormous variety of secular objects, from jewelry to furniture. Under the patronage of aristocrats, amber carving reached its height in Prussia in the 16th, 17th and 18th centuries, culminating in the mystery-shrouded Amber Room.

The romance isn't over yet. Amber jewelry is still being produced in prodigious quantities, and thanks to Jurassic Park, there is a new market in bug- and animal-bearing amber as well. The growing demand for such items has run up prices for larger specimens to thousands of dollars--creating a secondary, shadow market for amber forgeries. Careless consumers may find themselves owning very expensive chunks of yellow plastic. But buyers who deal with reputable specialty catalogs and museum stores can, for a modest price, experience firsthand the beauty and mystique of these golden treasures from the ancient past.



Not to be confused with Kathleen Winsor's 1940's 'romance' novel - reviewed here by The Guardian's Elaine Showalter:

<https://www.theguardian.com/books/2002/aug/10/featuresreviews.guardianreview19>



SECOND ANNOUNCEMENT AND CALL FOR ABSTRACTS

XI COLLOQUIUM ON SOCIAL INSECTS

Tarapoto, San Martín, Peru

7-11 August 2017

The Andean-Caribbean Section of the International Union for the Study of Social Insects is very pleased to invite professional and amateur researchers and students to the marvelous Peruvian Amazon for our eleventh Colloquium on Social Insects.

These biennial meetings are a forum for discussion, sharing of results and stimulation of new researches into the extraordinary world of social bees, social wasps, ants, termites and their subsocial relatives. The languages of the meeting are **English, Spanish and Portuguese**.

Venue

This year, for the first time we will be meeting in Peru.

The small city (pop. 117,000) of Tarapoto, San Martín province is located the north-central part of the country (6°29'S 76°22'W). Known as the City of Palms, Tarapoto lies in the Amazonian Region at an average elevation of 350 m. Our sessions will be held at the National University of San Martín (<http://www.unsm.edu.pe/>) and Expo Amazónica.

Colleagues from outside the Andean-Caribbean Section are welcome to attend on the same basis as our members.

There is no registration fee.

Norms for abstracts

In English, Spanish or Portuguese.

Title, no more than 25 words.

Author(s): Name, institution or research group, country, electronic address. Underline name of presenting author.

Text, no more than 250 words.

Norms for posters

Maximum size 110 by 90 cm.

Title and authors as in the norms for abstracts.

Registration and submission of abstracts should be sent to: xicoloquioiussi@gmail.com

Indicate whether the oral or poster format is preferred.

Deadline for receipt of abstracts: 30 June 2017.

Further information or inquiries:

marilena.marconi@gmail.com

(+51) 962 735 391

(+51) 942 058 676

<https://sites.google.com/site/iussiseccionbolivariana/>

<https://www.facebook.com/meliponinos>