



IUSSI North-west European section

International Union for the Study of Social Insects
Autumn Newsletter 2017

Officers

President



Prof. Paul Eggleton
Department of Life Sciences
Natural History Museum
London, UK
p.eggleton@nhm.ac.uk

Secretary



Dr. Heikki Helanterä
Centre of Excellence in Biological Interactions
Department of Biosciences
University of Helsinki
Finland
heikki.helantera@helsinki.fi
Contact him about: Newsletter, meetings, general information

Treasurer



Dr. Elizabeth Duncan
School of Biology
Faculty of Biological Sciences
University of Leeds
UK
E.J.Duncan@leeds.ac.uk
Contact her about: Membership, student grants

Webmaster



Dr. David Nash
Centre for Social Evolution
University of Copenhagen
DRNash@bio.ku.dk
<http://www.zi.ku.dk/personal/drnash/>
Contact him about: Website queries or suggestions

Announcements

Winter meeting (see also poster at the end of newsletter!)

Registration is now open for the 2017 Winter meeting of the NW European section of the IUSSI! <http://iussiyork17.weebly.com>

We look forward to welcoming you to beautiful York for this meeting which will be held at the University of York on the 18th and 19th of December.

Plenary Speakers: We are very excited to announce that Professor Rebecca Kilner (University of Cambridge) and Professor Lars Chittka (Queen Mary University of London) are going to be our plenary speakers at this meeting.

Scientific program and workshops: The program will also have contributed talks and there has been some interest in having some workshops associated with this meeting - if you are interested in running a workshop or have an idea for a workshop see the conference website for details.

Deadline for Abstracts/Registration: The deadline for abstract submission is the 19th of November and the deadline for registration is the 1st of December.

The conference website address is <http://iussiyork17.weebly.com> and has all of the information about the conference, plenary speakers, deadlines, accommodation etc. and will be updated regularly. Feel free to pass this message on to anyone who you think might be interested in attending.

Membership reminder

T'is the season for new students to start their research degrees. So now is a great time to check with your research groups and ensure everyone has renewed their memberships and also to recruit new members. If you are not sure if you have paid, drop Liz an e-mail (e.j.duncan@leeds.ac.uk) and she can check the database.

Membership fees are unchanged at £7.50 for students and £15 for full members. Payments can be made by:

1) bank transfer. Account name: Northwest European section IUSSI; account number: 16100247; sort code: 602462; IBAN: GB86NWBK60246216100247; SWIFT/BIC: NWBKGB2L; bank address: Natwest, Main Street, Heslington, York, YO10 5ZB

2) paypal to NWEuropeanSection.iussi@gmail.com

3) cheques payable to Northwest European section IUSSI. Cheques can be sent to:

Elizabeth Duncan
Faculty of Biological Sciences
University of Leeds
Leeds, LS2 9JT

Be sure to include your name as a reference when renewing by bank transfer or paypal. When you have renewed, please simply let me know how and when you have paid and also let me know if you would like a receipt for your records. You don't need to complete the membership form (downloadable from <http://www.iussi.org/NWEurope/subs.htm>) unless your details have changed."

Lab News

The Robinson Lab (University of York)

Ant research in York is continuing while **Elva** is on maternity leave. **Dominic Burns** has had a successful first field season working on wood ant polydomous foraging networks in the Peak District, **Eleanor Drinkwater** is collecting interesting laboratory data on collective personalities in *Myrmica rubra*, and **Phillip Buckham-Bonnett** has been continuing his work on the impact of *Lasius neglectus* in the UK. The ant group again hosted **Courtney Rockenbach** from Simon Garnier's group over the summer working on trail traffic in polydomous systems. The ant group will have two new PhD students, this autumn, both funded by NERC Case studentships with Forest Research: **Megan Holgate** will be modelling range expansion in wood ants in collaboration with **Justin Travis** at Aberdeen, and Josie Monaghan will be working on speciation and genetic structure in wood ants in collaboration with **Jonna Kulmuni** at the University of Helsinki. The group will also welcome **Conor Cooper** and **Ryan Bromwell**, who will start MSci by Research projects on using ants as bioindicators in collaboration with **Ben Hoffmann** at CSIRO, Darwin.

The ant group is also looking forward to hosting this year's Winter Meeting in York, 18th-19th December 2017. See you there!

Newest member of the Robinson Ant Lab on his first field trip



Current and former members of the Robinson Ant Lab at the Winter Meeting 2016



Brown Lab News

It's been a fun and busy year! The bees woke up in February, which meant all hands to the pump for collecting, screening for parasites, and rearing queens. Since then, everyone's been pretty full on with work, but we did have a great lab day out at Dungeness in early May, where we saw some wonderful social and not-so-social insects – check out Emily's blogpost for more details (<https://www.markjfbrown.com/single-post/2017/05/29/The-hunt-for-rare-bumblebees-at-RSPB-Dungeness-a-lab-trip>).

Since then, quite a few of us have taken a trip down south to conduct fieldwork at NIAB-EMR in Kent this summer. Emily and Judy were busy with their first season of fieldwork kicking off at the beginning of June. They had a warm (at times 45°C in the tunnels!), intensive 5 weeks of sample collection from bumblebee colonies investigating whether bee density affects parasite (the trypanosome *Crithidia bombi* and Slow Bee Paralysis Virus) transmission through increased frequency of flower visitation. Meanwhile, Callum was investigating whether parasites of bumblebees can affect the behaviour and pollination services that the bees provide. We're all back in the lab with plenty of samples to process and keep us busy - hopefully we'll have some results to share with you soon! Dylan, who is normally to be found in polytunnels at NIAB-EMR, was noticeable by his absence, as he spends his days writing up to submit his PhD.

Arran has also been working away from RHUL for most of the summer, working at the Jodrell lab in Kew Gardens identifying compounds found in the pollen and nectar of Agri-environment scheme plants and testing them against the gut trypanosome parasite *Crithidia bombi*.

Mark spent most of the year writing a proposal to the EU Horizon 2020 Bee Health call, but he did manage to spend a few days in Logan, Utah, teaching on BOMBUSS - an international workshop developing standardised methods for bumblebee research - at which he also got to see a 95% solar eclipse, which was pretty cool (quite literally!). Mark also got to do some fun media wrangling after Gemma Baron's paper came out in *Nature Ecology & Evolution* (see publications), including an interview with Radio Sputnik (the successor to Pravda, for those of you old enough to get the reference...).

We're being joined by two new Masters students in late September, and we're looking forward to introducing them to bees, and to the NW European IUSSE in York in December – can't wait for another great meeting and to catch up with you all!

Centre for Social Evolution (CSE), Copenhagen

Congratulations to Guojie Zhang for his promotion to full professor. His now substantial group works on the neurodevelopment in ants and on genomic projects in birds and mammals. As far as social insects go, his postdocs Manuel Nagel and Luigi Pontieri continued their ant work together with Bitao Qiu while increasingly focusing on the pharaoh ant as a model. Guojie also continued his key role in the GAGA consortium, aiming to sequence the genomes of at least 200 ant species (representing most genera in the world), with Koos, Lukas Schrader and Nate Sanders as co-coordinators. The first GAGA samples have now reached Copenhagen where Morten Schiøtt is about to extract the DNA/RNA, after which Novogene will produce almost gapless genome assemblies based on long-read PacBio sequencing. European colleagues have been committing big time to obtain GAGA samples, so we are confident that most of that will be completed in 2018. Similar initiatives are underway to cover sampling in the Americas and other continents. Stay tuned on the GAGA website (<http://antgenomics.dk/>) and get involved if you see opportunities!

Congratulations also to Jon Shik who received a 5-year ERC Starting Grant to continue working on ecophysiological trade-offs in attine ant crop domestication. His research will combine field experiments at the Smithsonian Tropical Research Institute in Panama with an exploration of the genes enabling farming resiliency in diverse habitats. Jon's new Assistant Professorship will imply a significant reinforcement of Copenhagen ant research in community ecology and eco-physiology.

Michael continued his work on symbiotic complementarity in pathogen-defence and plant-biomass decomposition by fungus-farming termites, but members of his group now also explore links between diet and gut microbiota composition in several non-social animals. Postdoc Victoria Challinor and PhD students Haofu Hu and Rafael da Costa continued their projects and Irshad Il Haq (PhD Groningen Institute of Evolutionary Life Sciences) will join the group in October 2017. Michael also recently received funding to explore fungal adaptations to heat stress and termite-hostility, which will start up with a new PhD and Postdoc in early 2018, and he became involved in CSE's branch of Evolutionary Medicine, joining Koos in supervising Birgitte Hollegaard's PhD while he was away.

David's PhD student Anne Andersen has now completed her lab work and has started to write up. New PhD student Guoliang Pan joined the group to work on conservation genetics - in this case, of snow leopards in China! David also ran the PhD course *Taxonomy, Identification and Ecology of European Ants* for the third time, with help from Jes and invited teachers Lars Vilhelmsen (Natural History Museum, Copenhagen) Riitta Savolainen (Helsinki) and Christos Georgiadis (Athens), and he remains a key collaborator in some of Koos' ERC projects.

Jes continued to focus on the biodiversity of urban bees (with CSE technician Henning Madsen) and started to work with Jon Shik on nutrition and foraging in the pharaoh ant. He supplements his social insect work with studies on the invasive raccoon dog together with Julie Sheard, who recently started a Danish ant fauna citizen science PhD with the Center for Macroecology upstairs.

Line Ugelvig just left for a stay with Daniel Kronauer at Rockefeller and is expected back in February 2018. Her Fulbright Fellow Veronica Sinotte is half-way with her lab project and will visit Marc Seid's lab soon to look for possible roles of neuroamines in attine ant disease defences.

Roberta (Berti) Fisher (PhD Oxford with Stu West; former postdoc of Toby Kiers, Amsterdam) joined CSE, funded by a Carlsberg Distinguished Postdoctoral Fellowship, to work on the (social) evolution of multicellularity, splitting her time between comparative data analysis at CSE with Koos and molecular research on facultatively multicellular yeast in Birgitte Regenbergs lab in the next-door building.

Lukas Schrader took up an Assistant Professor position in Jürgen Gadau's new group in Münster, Germany, but will continue his coordinating role in GAGA and his research on *Acromyrmex* leaf-cutting ants and their inquilines in collaboration with Koos, Guojie and Christian Rabeling.

Birgitte Hollegaard (supervisors Koos and Michael), Saria Otani (supervisor Michael) and Joanito Liberti (supervisor Koos and Boris Baer) successfully defended their PhD theses, and Bitao Qiu obtained his MSc degree as part of his integrated MSc+PhD program, and is now focusing on the developmental transcriptomes of pharaoh ants for the final two years of his PhD (supervisors Guojie and Koos).

Koos returned from his six months sabbatical at Oxford Zoology just before the Tinbergen building had to be vacated because of a hidden asbestos problem and resumed his normal Copenhagen activities. His review paper on the superorganism lost in translation, with former Fulbright fellow Rick Gawne, appeared in *Biological Reviews* a few months ago. Together with Morten Schiøtt and postdocs Tabi Innocent, Panos Sapountzis, Mariya Zhukova and Joanito Liberti, he is busy with a series of write-ups from his ERC grant. This work also includes PhD student Jack Howe who hosted Calum Stephenson from Oxford for his undergraduate project on leaf-cutting ants from Trinidad.

CSE had its usual field campaigns in Panama, South Africa and Denmark, and a substantial delegation attended the back-to-back Evolutionary Medicine and ESEB congresses in Groningen. As always, Sylvia Mathiasen, Bettina Skytte, Morten Schiøtt, Rasmus S. Larsen and Henning Madsen secured that CSE logistics continued to run as efficient as ever, and several MSc, BSc and project students contributed to ongoing research.

Copenhagen, 25 September 2017

Koos Boomsma, on behalf of all at CSE

Wurm Lab (Queen Mary University London) <https://wurmlab.github.io>

PhD student **Roddy Pracana** published his first two papers from his PhD, examining the evolution and differentiation of fire ant social chromosomes, and characterising differences in Gp-9-like odorant binding proteins between social chromosomes. He is now in the final stretch of his thesis write up. Roddy was helped in aspects of the analyses of his papers by our former intern, **Ilya Levantis**, who has now started a PhD with Prof. Steve Rossiter examining retroviruses in bats. We wish him luck with his future studies. PhD student **Leandro Santiago** is entering his final year, examining gene expression across a number of social insect species. Second year students **Emeline Favreau** and **Carlos Ruiz Martinez** have enjoyed the fresh air of field work collecting ants in France and the USA, respectively, and are busy in the lab with extractions. Emeline presented an overview of her project at Evolution in Portland while both presented posters at ESEB in Groningen. Postdoc **Joe Colgan** is in the midst of analysing population genomics for wild bumblebees in

Britain, which he presented at the recent Royal Entomological Society Insect Genomics and the Conservation of Adaptive Potential and Functional Diversity meetings.

This year has also seen arrivals and sadly, departures. **Yannick Wurm** is back in business after his paternity leave. After circling the lab for several years, **Anurag Priyam** has now started a PhD with us looking at genome structure evolution. Undergraduate **Lawrence Maynard** has started in the group and developing databases for the housing of population genetic data for social insects. **Eckart Stolle** has finished his Marie Curie-funded postdoc examining population genomics of the fire ant. He has now taken up an exciting junior group-leader position with Prof. Rob Paxton at Halle in Germany. We also said goodbye to our two MSc students, **Gino Brignoli** and **Abdoulie Kanteh**, who respectively were examining polyandry in *Lasius* and identifying genes under selection in *Bombus*.

TEAM::ANTZZ (Helsinki)

TEAM::ANTZZ is changing. Our time as part of the Centre of Excellence in Biological Interactions is coming to an end after six successful and happy years. We are grateful for our collaborations thus far, that have led to a vibrant and diverse array of research, yet we are always eager to make new connections. Under the unwavering leadership of Lotta Sundström and our dedicated post-docs & PIs, the team is going from strength to strength.

In August, Dr Rose Thorogood, from the University of Cambridge, joined us to learn more about kin selection and social behaviour, and how she can transfer these insights to vertebrate studies. Rose has since started a position as Assistant Professor of Behavioural Ecology in the department (as part of the Helsinki Institute of Life Sciences). She has also had a short-term student, Felicitas Pamatat, who is visiting from The University of Bielefeld.

The group is sad to say goodbye to two PhDs. Jana Wolf defended her thesis on queen size morphs in *Myrmica ruginodis* in October 2016, with David Nash as her opponent, and Dimitri Stucki also defended his thesis on "Individual stress-responses in the ant *Formica exsecta* in September 2017, with Line Ugelvig as his opponent. However, we're delighted to welcome back both Claire Morandin & Unni Pulliainen from maternity leave. Claire will continue her postdoc, and is hard at work trying to spread co-expression network love. Meanwhile Unni will continue her PhD under the supervision of Lotta Sundström. The invaluable lab technician, Heini Ali-Kovero, is still with us.

Dalial Freitak and her students Siiri Fuchs & Matti Leponiemi, as well as Heli Salmela with assistance of Taina Stark in TEAM::BEEZ, have been busy in trying to make honey bees more resistant against bacterial and viral infections. Matti Leponiemi started his master thesis under supervision of Dalial, and spent a month in Arizona State University in order to understand honey bee – virus interactions. The greenhouse area of Helsinki university Viikki campus has been taken over by beehives in the frames of the TEKES funded PrimeBEE project led by Dalial Freitak, there with help of Heli Salmela the vaccination of honey bees is being tested. Dalial Freitak and Heli Salmela are continuing with the process of patenting the honey bee vaccination approach. Heli Salmela's MSc student, Satu Paavonsalo, started a project on honey bee immune cells - a novel topic within our group. MSc students Salla Lohi and Marianne Teichmann have now completed their Masters concerning honey bee immunity under supervision of Dalial.

Helena Johansson continues working on population genetics/genomics and ant nest microbes. PhD students Stafva Lindström and Kishor Dhaygude (jointly supervised by Helena Johansson and Lotta Sundström) have started the countdown to their thesis submissions (due in the next six months...). Finally, this team's MSc student, Laura Soininen graduated in spring.

Jonna Kulmuni has been back in Helsinki for a year now, and she has worked hard to establish her own line of research. During 2017 she received a Marie Curie fellowship for her project SpeciAnt, Academy of Finland post doctoral fellowship and HiLIFE fellowship. Her PhD, Jack Beresford, is coming to the end of his first year in Helsinki, under the joint supervision of Lotta Sundström and Roger Butlin. Two other short term students, Lucy Pluckrose and Ann-Kristin Dicke, have joined Jonna to discover the mysteries of speciation in ants.

Heikki is now starting the final year of investigating evolutionary transitions and superorganismality funded by the Kone Foundation. Anna Hietala finished her MSc thesis under Heikki's and Claire's supervision, on caste and context specific gene expression of four Vitellogenin copies in *Formica fusca*. Heikki and Dalial

also made some promising new openings into the exciting world of ant-pathogen-aphid-plant interactions (in the true spirit of CoE in Biological Interactions you might say!) with our trainee Jason Rissanen, to be continued in the next field season.

Perttu Seppä continues his efforts educating students on the secrets of population genetics and studying conservation genetics of *Myrmica* and *Formica* ants. Their PhD student Sanja Hakala is steadily studying dispersal and supercoloniality in *Formica* ants. Sanja has also had help in the field from a new trainee, Tanya Troitsky. MSc student Mats Ittonen, supervised by Sanja, Heikki and Perttu, is adding final touches to his MSc thesis on supercoloniality in *Formica pressilabris*, and Eeva Vakkari is writing her bachelor's thesis.

Lotta Sundström herself has been very busy with supervising, being a co-director of the CoE, director of the doctoral programme in Wildlife biology, and the vice dean of the Faculty of Biological and Environmental Sciences. Despite these duties, she still continues to work as a field assistant during the summer months, i.e. boat driver and ant colony sampler, in Tvärminne.

Duncan Lab (Leeds)

It is hard to believe that the summer is already over - It has been another busy one here in Leeds! The lab has been buzzing (sorry!) over the summer with two Masters student's (Emily and Flora) working on honeybees, Jens continuing his PhD working with *Osmia* and honeybees, as well as Liz and a visiting technician all-trying to make the most of the somewhat patchy weather/bee season.



In addition to looking after the research hives here Liz also had her first taste of fieldwork down in Southern England and, by all accounts, rather enjoyed it – even managing to improve her sweep netting technique by the end of the second trip so that not **so** many insects were getting away. The highlight of the trip was seeing a red shanked carder bee, though Liz didn't manage to get a photo.



Emily and Flora were doing their masters projects over the summer and have put in some great work establishing some behavioural assays in the lab. Thankfully they are just collecting the last of their data (just in the nick of time!).

Despite the bee season being over the lab is getting fuller! We welcomed four undergraduate project students to the lab last week and Rosemary Knapp is starting her PhD with us next week. We also heard that

Mackenzie Lovegrove, who is Liz's PhD student based in New Zealand, has secured funding for an extended visit next summer.

Biology at Kings Education, Bournemouth

I am the Biology coordinator for Kings Education which has colleagues in Oxford and London as well as Bournemouth as well as in the USA. We are an international school and teach academic subjects as well as English, English for specific academic purposes as well as IELTS.

The students have had very little exposure to practical work and fieldwork and so the fieldtrip I hold annually is very much a cultural introduction the flora and fauna of the English countryside as well as learning about the behaviour and ecology of invertebrates and vertebrates.

I get a real buzz myself, especially as the locality is near to my *Myrmica rubra* field study sites.

This is a report from last year's fieldtrip and I there will be another trip next month with a new group of students.

Dr EJM Evesham
Kings Education, Bournemouth,
58 Braidley Road,
Bournemouth
BH2 6LD

Biology Fieldtrip October 2016

Day 1

It's Biology Week and we are at Leeson House, Swanage taking in the fauna and flora on the numerous ecosystems, only the south west coast can offer.

The student group consists of A-level and Foundation and they have covered a large proportion of the course in just 2 days! Yes, I work them hard at Kings Bournemouth.

On arrival, we got cold and windswept while studying succession at Studland. The students collected a large amount of data, such as the population density of heather and grasses along a transect, soil moisture and pH, wind speed, soil temperature and gradient. Our risk assessment included snakes and nudists! Yes, the beach is well known to be partially taken up by such creatures, although we did not spot any on this occasion.

The students then used lab facilities to analyse their data and set out mammal traps before taking a break for supper. The teachers of the junior school that we were sharing the accommodation with seemed at the end of their tether with their little ones! Boy, am I glad to have such hard-working, mature students who are also pleasant to be with.

Back to the lab for more work. The students were allowed some free time to play table tennis, make hot chocolate, watch TV, chat and chill before bedtime.

More adventures to follow.

Day 2

The next morning, the students were on time for their first session in the lab, despite staying up later as students do! They painted woodlice in order to carry out a mark-recapture method to find out their population density under tree stumps and logs. We also looked at the diversity of moths that had been collected over night. What an array of them and such distinct markings. The most exciting thing, for the students, was opening their mammal traps to see what had been fooled by the temptation of food and shelter overnight. More than a 50% success rate! The enjoyment and delight of releasing the contents of the trap, into a clear bag, in order to identify the entrapped creatures before they ran up the sleeves of the students was had by all. They were all wood mice...and one pregnant one. It took some convincing that the students could not take the mice back to Bournemouth to show their friends!

Then it was off to the River Piddle to look at the effect of velocity of species diversity of invertebrates. So it was on with the waders, net in hand as well as flow-rate metres, metres for mineral deposits and oxygen levels. The students took this to heart and looked like professional Dorset fisherman! The students then heartedly when about collecting their data and identifying their finds, although one student preferred to play with a dog whose owner came over to chat to us, by throwing sticks! The student concerned could not believe the intelligence of the dog that eagerly retrieved said stick and dropped it ready to play the game again.

After a warm up and a bite to eat, the students pursued individual, biotic projects around the grounds of Leeson House. This is when we came across a recently discovered Second World War bunker - apparently it was for workers who developed the radar that was so vital in the war effort. The bunker is now a hide for bats.

With many different investigations and a huge amount of data to analyse, the students were occupied until bedtime! It was not me that was the slave driver, it was purely their enjoyment of working together, helping one another, sharing information and above all utilising their English language skills when conversing.



Day 3

Our last day at Leeson House and it seems as though we have been here a week! So it was up early to pack and clear the rooms before breakfast. The students then recaptured their woodlice to count the number of marked and unmarked individuals to estimate their population density. The students worked with precision and gained a good result. Then it was time to go bird ringing! Yes—the tutor is a keen ornithologist and was licenced to trap birds which he was able to show the students. The first was a wren, which was ringed, weighed and had its wing size measured as well as age assessed. One of the students was then able to handle it gently and set it free. The data adds to the vast amount collected by the Ornithological Society to monitor bird populations, positions and migration routes. The second bird was a Yellow Crest, which was even smaller than a wren and had stopped off on its migration journey from Scandinavia to Africa. Amazing. Then we packed up and set off to our last destination - Kimmeridge Bay. Clad in wellies, while the tide was still low, the students carried out surveys of different species of snails along a transect from low-tide to high-tide up the beach. The aim was to discover which type of snail could not tolerate desiccation and those which could. Some were so tiny and lived in the cracks of the mud flats. I would not have noticed them had they not been pointed out. The students also carried out limpet surveys, measuring their density, height and width to assess the effect of water velocity on their size. The students took great excitement from discovering sea anemones, star fish, crabs of various sorts and fish before the tide came in and it was time to head home. This was such an educational and social experience for my students who, for the first time, had seen and analysed a huge array of flora and fauna. The students have also been able to add much scientific terminology to their vocabulary as well as having a fun time with lots of laughter. If anything could best equip my students for University, then this certainly will.

North-west European Section



**Winter meeting
December 18th-19th 2017
University of York**



<http://iussiyork17.weebly.com>

Abstract submission deadline: 19th November 2017

Registration deadline: 1st December 2017

Plenary Speakers

Professor Rebecca Kilner
University of Cambridge

Professor Lars Chittka
Queen Mary University of London