IUSSI AUSTRALASIAN SECTION NEWSLETTER

March 2012

Welcome to our fifth Newsletter

A big Thank You to Simon Robson for organising a splendid meeting in Townsville last September. I counted 15 social insect talks which is not bad given that our society is still rather small. Having said that, I think this year has shown the biggest increase in members. Now that the International Body has money to hand out to student members, make sure your students are signed up so that they can apply for travel funds. The first recipients of the IUSSI travel grants were Frances Goudie, Michael Holmes, Chris Reid and James Makinson. Well done to all! Also, make sure you regularly check the Conference website for updates and expressions of interest: www.IUSSI2014.com. If anyone is going to a meeting this year and would like to advertise IUSSI2014, drop me an email and I will send you our promotion slide. Have a good year.

Madeleine Beekman

Treasurer of the Australian Section of the IUSSI (madeleine.beekman@sydney.edu.au)

Annual General Meeting

This year's Annual General Meeting will be held at the University of Sydney on Friday April 20, at 11am. I shall circulate the agenda and the financial report prior to the meeting. All members are welcome. As soon as the financial report is finalised, I will not be able to accept any new members for 2012. Hence, if there are still people out there who want to sign up, do it as soon as possible. Remember, only students who are a member in 2012 will be able to apply for next year's travel grants.

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News from Curtin University

Knowledge about Neotropical ants began to accumulate soon after European colonization, when the Portuguese owner of a sugarcane factory in the Reconcavo region at Bahia, Brasil, Gabriel Soares de Souza in 1587 and the Spaniard José Celestino Mutis in 1780's made the first observations about ants in their American habitats. These observations were soon followed by more texts published by naturalist travellers in the XIX Century reporting ant behaviour, among whom Bates is one between the best known. Myrmecology as a discipline of entomology took its roots when these travellers and a myriad of correspondents distributed throughout the American continent sent biological material to European collections where taxonomists such as Auguste Forel, Carlo Emery or Felix Santschi, could study and describe considerable amounts of new ant material. In the meantime, Forel, Santschi (as Forel's secretary) and Edouard Bugnion (Forel's brother-inlaw) made a memorable travel (1896) through the Sierra Nevada de Santa Marta region in the northeast of Colombia, where they subsequently accumulated ant observations and experience which they will use throughout their lives. Interestingly, all the three produced latter independent

memories of the Colombian expedition. Other important contributors to earlier Neotropical myrmecology in the XIX and XX centuries were the German mycologist Alfred Möller in southern Brazil and Franciscan priests Thomas Borgmeier and Walter Kempf, the Brazilians Herman Luederwaldt, Karol Lenko, Mario Autuori, Elpídio Amante and Cincinnato Rory Gonçalves, the Argentineans Carlos Bruch, Angel Gallardo and Nicolas Kusnezov, and the North Americans William M. Mann, Neal Albert Weber, William Morton Wheeler. Research output from the Neotropical Region still remained modest until the Second World War. This started to change with the rapid development of national infrastructures that started to occur in the 1960's and the burgeoning of new universities in the 1970's and 80's. Most of the older scientific contributions were historically devoted to taxonomy and leaf-cutter ant damage and control, but the topics which have called the attention of myrmecologists in recent years have been much more diverse and concerned essentially with ant communities, ant-plant relations, mutualisms, biomonitoring, biogeography, morphology and anatomy, genetics and cytogenetics, and taxonomy.

Jonathan Majer and Jacques Delabie meeting at the cocoa research institute of Brazil, Ilheus, to discuss the volume

The upsurge in interest in Neotropical ants is so great that Latin American ant publications could soon account for one third of annual World ant literature. Jonathan Majer and the Franco-Brazilian scientist Jacques Delabie and the Columbian ant researcher Fernando Fernandes have just completed guest-editing a volume of the entomological journal *Psyche* entitled 'Advances in Neotropical Myrmecology. This is an on-line journal which is accessible at: http://www.hindawi.com/journals/psyche/

Jonathan Majer

Termite research at the University of Sydney

Nate Lo, together with computational biologist Simon Ho, has recently formed the Molecular Ecology, Evolution, and Phylogenetics laboratory (MEEP) in The School of Biological Sciences at The University of Sydney. The University kindly provided $620K in 2011 to Nate and Simon to refurbish the previous fruit-fly laboratory. One of the foci of MEEP is termite biology, including termite phylogenetics, colony genetic structure, and molecular biology. MEEP has close connections to the Beelab, which is just down the stairs! In 2012, the Japanese termite biologists Yoshinobu Hayashi and Kiyoto Maekawa will visit MEEP. Hayashi will visit on a two-year JSPS international fellowship, while Maekawa will visit on a 6 month sabbatical from The University of Toyama. Postdoctoral Fellow Vicky McCarl will also start working on termites in MEEP from March this year, funded by an ARC grant.

From left to right: Simon Ho, Tim Lee (see further), Martyna Molak, Luana Lins, and Nate Lo

Nate Lo

Who's New?

The following people have joined us this year.

Naïla Even and Eirik Søvik, Department of Brain, Behaviour and Evolution, Macquarie University, Sydney
Phil Lester, School of Biological Sciences, Victoria University, Wellington
Weetek Tay, Invertebrate Genome and Evolution, CSIRO
Alexandre Cristino, Gavin Taylor and Aoife Larkin, Queensland Brain Institute, University of Queensland
Dieter Hochuli, Tim Lee, Emily Remnant and Guénaël Cabanes, School of Biological Sciences, University of Sydney

Introducing Tim Lee

Hi there! My name is Tim Lee, and I'm starting my PhD this year supervised by Drs. Nathan Lo and Simon Ho, in the MEEP lab at the University of Sydney. I'll be working on a few related aspects of Australian termite biology, particularly species delimitation, caste determination and the consequences of genetic inheritance patterns on colony behaviour. Last year, I finished my honours work on the phylogeography of the terrestrial isopod Spherillo grossus, a common native woodlouse that curls up into a little ball when disturbed. Changing over to social insects will be a bit of a challenge, but one I'm very excited about!

Honey bee. Photo: Ryszard Maleszka

Introducing Guénaël Cabanes

I am a postdoc in the social insects lab in Sydney. The main goal of my post-doctoral project is to use nest-site selection and foraging by ant colonies as a paradigm to investigate how complex systems adapt their decision-making in a competitive environment. Specifically I will: (1) determine experimentally how individual ants change their behaviour under competition and how intra- and inter-specific competition affects the quality of the decision at the colony level; (2) use the experimental results to construct an Agent-Based model to determine how individual behaviour results in the global pattern observed. The main experimental part of this project will investigate the influence of competition on the colony's decision when choosing between different food patches and nest sites. Comparisons between a single colony making a choice and when in competition will highlight the influence of competition on the colony's decision. I expect that the change in preference when faced with a competitor will be strongest when the preferences of the focal colony and the competitor are very similar. I will therefore test colonies under competition with their own species (identical preferences) and with another species that has a different preference. I predict that weak competition improves the dynamics of the choice, i.e. the optimal patch/nest site will be chosen faster in a weak competitive situation than in the absence of competitors. Then, I will construct an Agent-Based model based on observed individual and collective behaviour to determine which individual rules are essential for the collective choice using data-mining methods. The aim is to produce a theoretical model of the ants' competitive interactions during foraging and emigration. I will use different unsupervised clustering algorithms on the data collected at the individual level to find patterns that are shared among individuals. I will then use the most powerful supervised algorithms to find the links between the different levels of organisation: individual behaviour, the clustering structure of

individuals in each colony and the global decision at the colony level. The outcome will be a hypothesis regarding the emergence of the observed colony-level behaviours from individual rules. finally, the Agent-Based model will be constructed. It will be used to validate the hypothesised mechanism and to make predictions about the colony's behaviour.

Introducing Emily Remnant

Emily has recently joined Ben Oldroyd and Madeleine Beekman as a Postdoctoral Researcher, where she will be involved in current ongoing projects investigating the genetics of honeybee reproduction. She has a background in molecular biology, completing her PhD with Drosophila studying the genetics of insecticide resistance, in the Department of Genetics at the University of Melbourne. Her interests include functional genetics and comparative genomics of insects, and she looks forward to exploring the genetic complexities of social insects. And bees are much better looking under the microscope than flies.

Introducing Phil Lester

I work on invasive ants and wasps, with research programmes on yellow crazy ants, Argentine ants, and common wasps (Vespula vulgaris). My graduate students do all the hard work- on areas ranging from population modeling to population genetics. Warm and sunny tropical islands are key study sites.

Introducing Naïla Even

Naïla is currently PhD student of Andrew Barron at Macquarie University. Her project is investigating on behavioural and physiological stress responses in honeybees. If you are interested you can get more details on her website: http://web.science.mq.edu.au/~neven.

Introducing Gavin Taylor

Gavin Taylor is currently working towards his PhD at the Queensland Brain Institute in Brisbane with Mandyam Srinivasan. He investigates how honeybees use the visual and mechanosensory information they perceive while moving in the world in to control both flying and walking behaviours. Honeybees are tethered and placed in virtual reality environments and exposed to precisely controlled stimuli; their motor output is also measured and allows them real time closed loop control of their environment. This research will lead to a better understanding of how simple minds deal with complex, multisensory information.

(Social Insect) Meetings

2012 is a busy year for international meetings…..

The 14th International Behavioral Ecology Congress (***ISBE***) to be held in Lund, Sweden from August 12 to August 17: www.isbe2012lund.org/

The XXIV International Congress of Entomology (***ICE***) will be held in Daegu, South Korea from August 19 until August 25:
edunabi.com/~ice2012/sub01_01.html

And last but not least, come to Tuscany for the 5th meeting of the European sections of the IUSSI (***EUROIUSSI 2012***). This meeting takes place from August 26 till August 30. See their website for details:

www.mdbenterprise.it/iussi/

Paper wasp. Photo: Ryszard Maleszka