ENTOMOLOGICAL SOCIETY OF QUEENSLAND INC

NEWS BULLETIN

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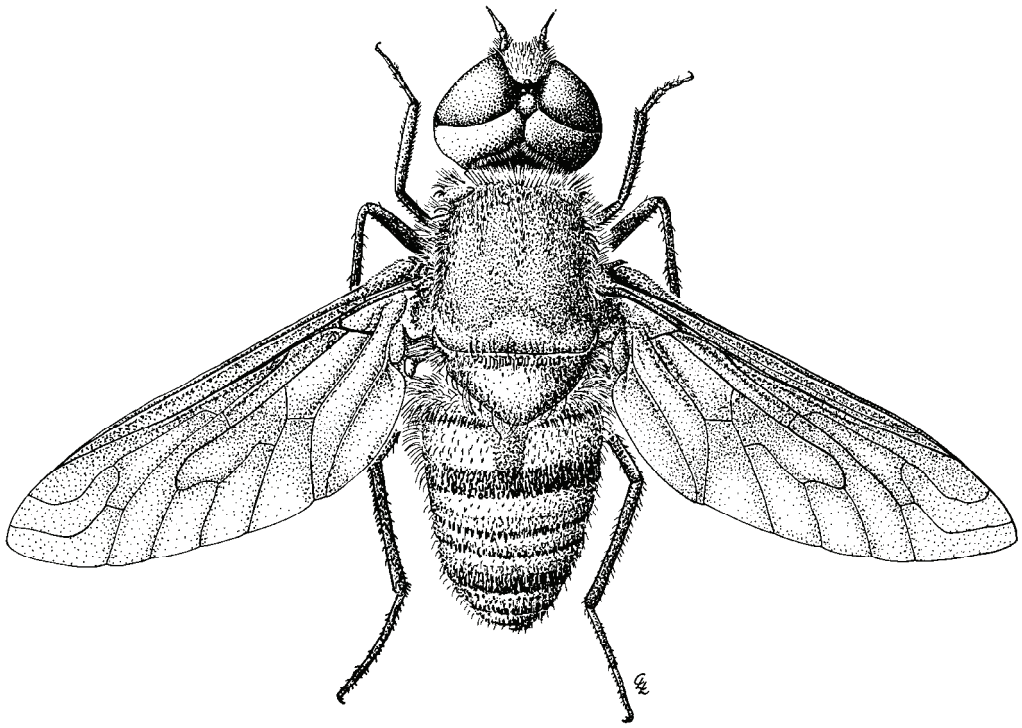

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THE ENTOMOLOGICAL SOCIETY OF QUEENSLAND

Internet: www.esq.org.au **Email:** esq@uqconnect.net
Address: PO Box 537, Indooroopilly Qld 4068

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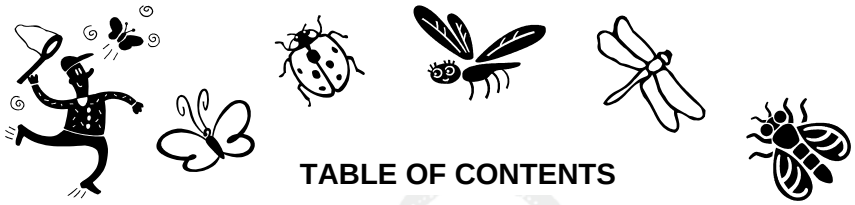

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The **ENTOMOLOGICAL SOCIETY OF QUEENSLAND INC.**, since its inception in 1923, has striven to promote the development of pure and applied entomological research in Australia, particularly in Queensland. The Society promotes liaison among entomologists through regular meetings and the distribution of a *News Bulletin* to members. Meetings are announced in the *News Bulletin*, and are normally held on the second Monday of each month (March to June, August to December), or on Tuesday if Monday is a public holiday. Visitors and members are welcome. Membership information can be obtained from the Honorary Secretary, or other office bearers of the Society. Membership is open to anyone interested in Entomology.

Contributions to the *News Bulletin* such as items of news, trip reports, announcements, etc are welcome and should be sent to the News Bulletin Editor.

The Society publishes **THE AUSTRALIAN ENTOMOLOGIST**. This is a refereed, illustrated journal devoted to Entomology in the Australian region, including New Zealand, Papua New Guinea and the islands of the South Western Pacific. The journal is published in four parts annually.

EMBLEM: The Society's emblem, chosen in 1973 on the 50th anniversary of the Society, is the king stag beetle, *Phalacrognathus muelleri* (Macleay), family Lucanidae (Coleoptera). Its magnificent purple and green colouration makes it one of the most attractive beetle species in Australia. It is restricted to the rainforests of northern Queensland.

Editorial

In this month's Bulletin we join Chris Burwell as he tells us how ant assemblages might be used to measure the effects of climate change, and receive the 'low down' on the staff and volunteers of Queensland Museum Entomology.

As the December issue will not be out until after Christmas, I'd like to take this opportunity (on behalf of the Society) to wish all of our members and supporters a great Christmas and a happy and safe new year.

Justin Bartlett
News Bulletin Editor

Send your news, notices, etc, direct to:
justin.bartlett@deedi.qld.gov.au

Minutes of General Meeting

Held in the Large Conference Room, CSIRO Entomology, Long Pocket Labs, 120 Meiers Road, Indooroopilly, on Monday, 9th November, 2009 at 12.00 noon.

Chairman: Matt Purcell.

Attendance: Justin Bartlett, Chris Burwell, Murdoch De Baar, Gio Fichera, Gary Fitt, Mic Julien, Judy King, Chris Lambkin, Lance Maddock, Gunter Maywald, Geoff Monteith, Bill Palmer, Sandy Pollock, Matt Purcell, Claudia Rodriguez, Bruce Sabine, Don Sands, Noel Starick, Fede Turco.

Visitors: Karen Bell, Robert Foottit, Lynne Griffin, Nate Hardy, Michael Meissle, Aki Nakamura, Philippa Nelson, Victorien Thiebault.

Apologies: Richard Bull, Lyn Cook, Ross Kendall, Nancy Schellhorn, Desley Tree, Susan Wright.

Minutes: The minutes of the last General Meeting, were circulated in the News Bulletin Vol. 37, Issue 7 of October 2009.
Moved the minutes be accepted as a true record: Justin Bartlett.
Seconded: Geoff Monteith.

Nominations for Membership:
The following nominations for Membership were received and approved by Council, and were put before the meeting for election:
Mrs Ellen Iramu of Gatton, Qld
Mrs Purwatiningsih of Gatton, Qld
Mr C.D. Herd from Pakenham Victoria

The Chairman called for members to vote for their election by a show of hands.
Carried unanimously.

General Business:
Anyone willing on Monday to speak on 14th December, 2009 at the Notes and Exhibits meeting please contact Chris Lambkin or Justin Bartlett.

Main Business

Ants with Altitude: the potential of ants as climate change bio-indicators in subtropical rainforest

Chris J. Burwell and Akihiro Nakamura

Biodiversity Program, Queensland Museum, PO Box 3300, South Brisbane 4101

Environmental Futures Centre and Griffith School of Environment, Griffith University, Nathan 4111, Qld, Australia.

Introduction

We conducted this study within the framework of IBISCA Queensland, an international collaborative project led by Prof Roger Kitching of the Griffith University School of Environment. Several ecological projects around the world have been conducted under the IBISCA 'franchise' each addressing a central question, focusing primarily on invertebrates and involving a team of international researchers. The first IBISCA project, held in Panama, investigated the distribution of invertebrates from the ground to the canopy in lowland tropical rainforest (Bassett *et al.* 2007); hence the derivation of IBISCA, Investigating the Biodiversity of Soil and Canopy Arthropods, a moniker producing the same acronym in English, French and Spanish. IBISCA style projects have been carried out in Panama, Queensland, Vanuatu and France with more in the pipeline.

The ecological question central to IBISCA Queensland was the beta diversity of invertebrates in relation to altitude, i.e. how do the distributions and abundances of invertebrates change as you move from lowlands to highlands in a mountainous region? This sort of information is very important for predicting and monitoring the impacts of climate change. Increasing temperatures, and associated climatic changes, are predicted to have dramatic impacts on organisms, affecting their distributions and abundances, the timing of events in their life cycles (phenology), their physiologies and their interactions with other organisms. In response to increasing temperatures, organisms are predicted to shift their distributions, tracking their preferred climatic envelopes. These distributional shifts may be latitudinal (towards the poles) or altitudinal (towards higher elevations) where temperatures are cooler. Recent range shifts of both kinds (altitudinal and latitudinal) have been demonstrated for a variety of organisms (e.g. Hickling *et al.* 2006, Wilson *et al.* 2007, Lenoir *et al.* 2008) mostly in the northern hemisphere where there is a wealth of good quality information about where animals and plants were distributed in the past. Such long-term datasets are rare in Australia and it is imperative that we establish sound information on the current distributions of organisms that can be used as a baseline to investigate changes that may be occurring as a result of climate change.

The aims of the IBISCA Queensland project were to describe the distributions of a range of different groups of invertebrates along an altitudinal gradient in subtropical rainforest at Lamington National Park, south-eastern Queensland. In addition, the distributions of plants along the gradient were investigated as well as how ecosystem processes such as pollination and herbivory change with increasing altitude. One of the main aims of the project is to identify a set of species (across several different insect groups) whose distributions are confined to particular ranges of altitude. These 'indicator species' could then be used in long-term monitoring programs to detect impacts due to climate change.

We focused on the distribution of ants along the transect and were interested in three sorts of questions:

1. Do ants show a strong altitudinal 'signal'? Do ant species richness, abundance and assemblage structure consistently change with increasing altitude?
2. Are there ants of conservation concern as a result of ongoing climate change? Are there many ant species restricted to higher altitudes?
3. Might we be able to use ants as indicators of the impacts of climate change? Are there some ant species that are characteristic of particular ranges of altitude?

The IBISCA study design

The IBISCA Queensland transect is located in the Green Mountains Section of Lamington National Park in the south-east corner of Queensland. Lamington National Park is part of the World Heritage listed Gondwana Rainforests of Australia, a series of rainforest reserves stretching from south-east Queensland to central New South Wales (previously known as the CERRA World Heritage area, see Williams 2002).

The IBISCA Queensland transect lies within continuous rainforest within the West Canungra Creek catchment. Four replicated survey plots (A-D) have been established at each of five broad zones of elevation; 300, 500, 700, 900 and 1100 m above sea level (20 plots in total) (see Figure 1). The plots within each zone vary somewhat in actual elevation, but are no more than 75 m greater or lower than their elevational zone. Within each zone, most plots are separated by at least 400 m. Although all the plots are located in rainforest, the forest type varies along the transect. The 300 m plots are in *Araucaria* complex notophyll vine forest, the mid elevation plots (500-900 m a.s.l.) in complex notophyll vine forest and the 1100 m plots in simple microphyll fern forest dominated by Antarctic Beech, *Nothofagus moorei*. All the IBISCA plots have basaltic soils. Each plot consists of a central 20 x 20 m quadrat and a surrounding circular survey area of 50 m radius measured from a metal stake located in the centre of the quadrat. The 300 and 500 m plots are situated in the valley of West Canungra Creek and lie within 100 metres of the creek. The 700 and 900 m plots lie along the ridge to the west of the creek, along the access road to O'Reilly's Guesthouse (700 m plots) or in the vicinity of the guesthouse and along the beginning of the Border Track (900 m plots). The 1100 m plots are close to Mt Bithongabel along the Border Track.

Ant collecting methods

We used three collecting methods to sample ants: timed hand collecting during the day; spraying large, living tree trunks with pyrethrum insecticide; and extracting ants from leaf litter with Tullgren funnels. Each time a plot was visited ants were collected by hand for one hour (taking foraging workers and also looking for nests under rocks, in rotten logs and hollow twigs and branches), 10 tree trunks were sprayed and two square metres of leaf litter sieved and extracted. All 20 plots were sampled on three separate occasions, in October 2006, March 2007 and January 2008.

Do ant species richness, abundance and assemblage structure consistently change with increasing altitude?

Across the whole transect we collected a total of 143 different ant species. Hand collecting yielded the most species (100) followed by tree trunk sprays (87) and litter extracts (78). Despite the lower number of species, most ants were extracted from litter (10 236).

Ant species richness was significantly related to altitude (Figure 2, P=0.0001). The average numbers of species per plot were not significantly different between the two lowest elevations (300 and 500 m) but there were progressive and significant declines in species richness with increasing altitude above 500 m, with a substantial drop at the highest elevation (1100 m) (Figure 2).

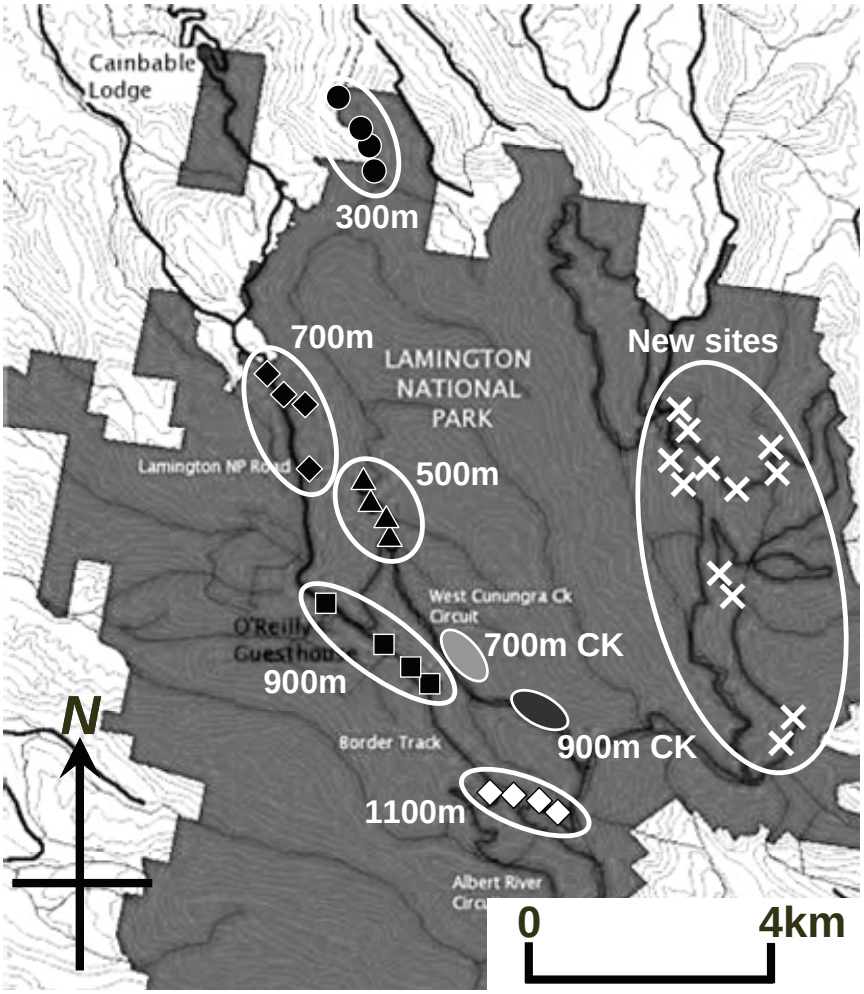

Figure 1. Map of Lamington National Park showing the locations of the IBISCA Queensland study plots and additional plots mentioned in the text. IBISCA plots (m a.s.l.): ● 300, ▲500, ◆ 700, ■ 900, ◇ 1100. **X** indicates the location of the additional plots sampled at Binna Burra ranging from 450 to 1100 m a.s.l. General location of additional higher elevation plots sampled along West Canungra Creek: 700 m a.s.l., 900 m a.s.l.

The relationship between overall ant abundance and altitude was less distinct, but there was a substantial drop in the numbers of ants in leaf litter at the 1100 m plots (Figure 3). At all other elevations there was an average of more than 100 ants per square metre of leaf litter, while at 1100 m there was on average less than 10 ants per square metre. In particular, a whole suite of litter-inhabiting species that were common at the 900 m plots were absent from the 1100 m plots.

We also found a very strong and significant relationship between altitude and the assemblage composition of ants from the plots, based on the presence and absence of species. Using non-metric multidimentional scaling (NMDS) techniques, the four plots from each altitudinal zone strongly clustered together and the assemblages from all altitudinal zones were significantly different from each other. In addition there was a gradual and progressive change in ant assemblages from low to high elevations. However, there was a substantial change in ant assemblages between the 900 and 1100 m plots.

So it seems clear that both ant species richness and the composition of ant species are clearly and consistently related to altitude along the transect. It is also clear that the ant fauna at the highest elevation plots is dramatically different from plots just 200 m lower in elevation. In particular there are many fewer species and individuals of ants at the highest elevations. This pattern appears to be consistent with other insect groups that have been investigated to date with a very distinct fauna of springtails, moths and beetles present at the 1100 m plots.

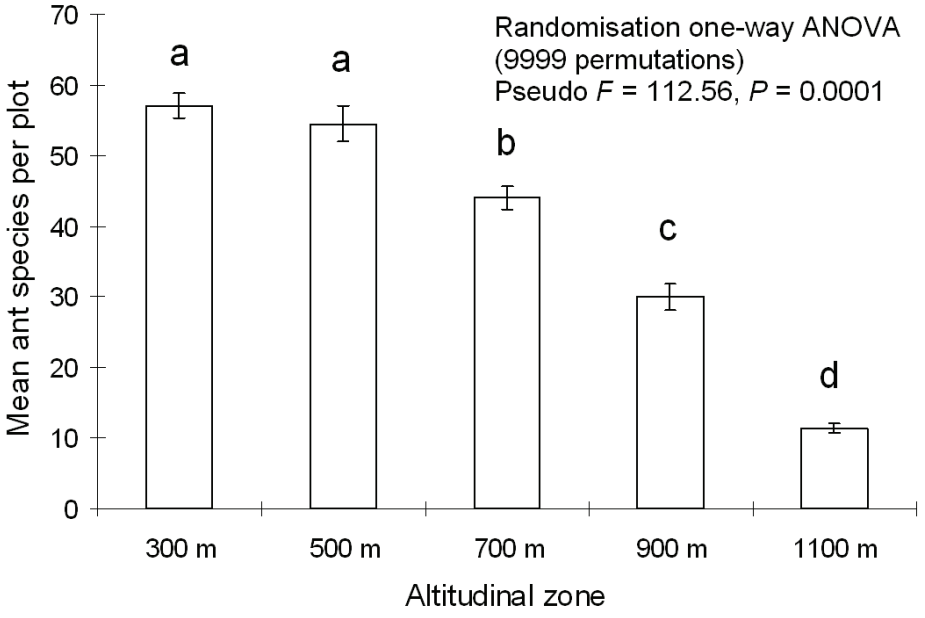

Figure 2. Relationship between the average species richness per plot and altitude. Data from all collecting methods and sampling occasions pooled. Elevations with different letters were significantly different from each other.

Are there ants of conservation concern as a result of climate change? Are there many ant species restricted to higher altitudes?

Despite a progressive drop in ant species along the gradient, particularly between the 900 and 1100 m plots, at least some species appear confined to, or at least more abundant at, the highest elevations. A small, pale, almost eyeless species of *Monomorium* (Figure 4a), a tree trunk-inhabiting species of *Discothyrea* (Figure 4b) and an arboreal species of *Myrmecorhynchus* (Figure 4c) were among some of the high altitude species collected only from plots at 900 and 1100 m, and which may be threatened by rising temperatures in the short-term. However, the distribution of these species is unknown at this stage, and it may be that they occur more widely in southern Australia. For example, *Notoncus spinisquamus* (Figure 4d), a yellowish, nocturnal species, was also confined to plots at 900 and 1100 m. It also occurs at high elevation in the Bunya Mountains near Oakey on the Darling Downs. However, this species is widely distributed in southern Australia where it is known to occur almost at sea level. Consequently, if climate change were to cause its local extirpation in the Border Ranges, it would be unlikely to result in the extinction of the species in the near future.

Might we be able to use ants as indicators of the impacts of climate change? Are there some ant species that are characteristic of particular ranges of altitude?

One the main objectives of the IBISCA Queensland project was to come up with a

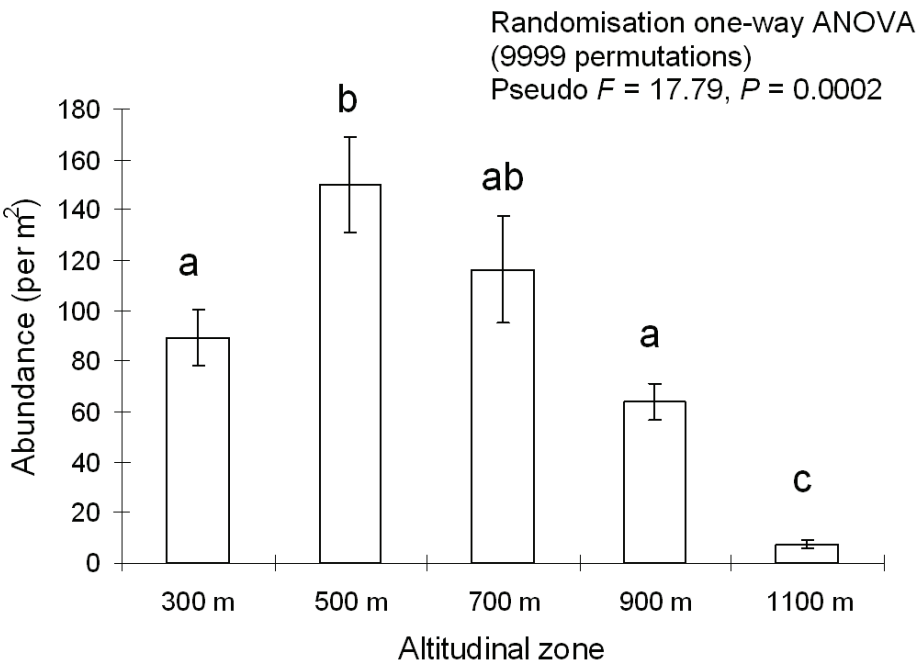

Figure 3. Relationship between the average abundance of ants extracted from leaf litter (expressed per square metre of litter) and altitude. Data from all sampling occasions pooled. Elevations with different letters are significantly different from each other.

set of indicator species (across a variety of taxa) that could be used in long-term monitoring programs to detect the impacts of climate change. Consequently, we used the Indicator Value Protocol (IndVal) of Dufrene and Legendre (1997) to rigorously identify ant species that were indicative of particular altitudes (e.g. 300 m a.s.l) or meaningful ranges of altitudes (e.g. 300-500 m or 700-1100 m). This method takes two factors into account when calculating indicator values, the specificity of a species for the altitude (or range of altitudes) of interest and its fidelity within that altitude. A species has high specificity when it mostly occurs within the altitude of interest and rarely occurs at other altitudes. A species has high fidelity when it occurs at the majority of the plots within the altitude or range of altitudes of interest. If we were interested in finding species indicative of say 300-500 m a.s.l., a particular ant species will have an indicator value of 100% (maximum value) if it occurs only at 300 and 500 m and nowhere else along the transect (maximum specificity) *and* is found at all the plots at 300 and 500 m (8 in total) (maximum fidelity). The fidelty and specificity of ant species were also statistically tested using a randomisation procedure. We used a somewhat conservative approach and concluded that a species was a significant indicator only if it had a *P*-value of <0.05 and an indicator value of >75%.

We found that around a third of the total ant species sampled along the transect (47 of 143 species) were significant indicators. Given that there is a significant decline in the number of ant species with increasing

Figure 4. High altitude ant species that were restricted to the 900 and 1100 m a.s.l. plots of the IBISCA Queensland transect. A, a small almost eyeless species of *Monomorium* belonging to the *hildebrandti* species-group; B, a tree-trunk inhabiting species of *Discothyrea*; C, an arboreal species of *Myrmecorhynchus*; D, *Notoncus spinisquamis*, a nocturnal species.

altitude, it is not surprising that there were many significant indicators of low or low to medium altitudes, fewer indicators of medium and medium to high altitudes and very few indicators of high altitudes. Nevertheless, there is a large number of ant species that could be used to monitor impacts of climate change along the entire length of the IBISCA transect.

Issues confounding the interpretation of IBISCA Queensland results

One problem with the experimental design of the IBISCA project is that we have a single transect. Although the design incorporates replication, the plots within each elevation are spatially clustered and the observed patterns of ant richness and assemblage structure may be driven by the close proximity of plots within each elevation. Consequently, we were keen to determine whether the ant species we identified as significant indicators from the IBISCA transect consistently responded to altitude elsewhere in Lamington National Park. We visited the Binna Burra side of the park in March 2009 and, using the same collecting methods, sampled the ants from 12 new plots (Figure 1) ranging in altitude from around 450 to 1100 m in elevation. The new Binna Burra transect was located about 4 km to the east of the IBISCA Qld transect.

Using canonical analysis of principal coordinates (CAP), we modelled the relationship between ant assemblages and altitude along the original IBISCA transect, based on the distributions of significant indicator species collected in January 2008 and the actual elevations of the plots. We then incorporated data from the Binna Burra transect into the model and predicted the elevations of the 12 new plots based on their assemblages of indicators. If the species we identified as indicators consistently respond to altitude on the new transect then there should be a more-or-less one to one correspondence between the predicted elevations of the new Binna Burra plots and their actual elevations. When we plotted predicted against actual elevation for the 12 Binna Burra plots we indeed found a basically 1 to 1 relationship with a trendline through the plots having a slope of 1.008. Most of the predicted elevations of the plots were close to their actual values, although a few were out by a factor of almost 100 m. Despite this, it seems that the ant species we identified as indicators respond consistently to altitude across wider spatial scales and are suitable for inclusion within long-term monitoring programs.

Another possible confounding issue with the IBISCA Qld study design is that the 300 m and 500 m plots are riparian, located within the valley of West Canungra Creek, while the higher elevation plots are located along the ridge to the west. We were interested in what effect being in close to proximity to the creek might have on ant assemblages. So in January 2008, while sampling the IBISCA Qld plots, we also sampled ants from eight new plots located higher up along West Canungra Creek, 4 plots at around 700 m a.s.l. and four plots at around 900 m a.s.l. (Figure 1). Using the methods described above, we predicted the elevations of the new creek plots from the composition of their ant assemblages, and compared the predicted values with their actual elevations.

To our surprise, the plots along the creek at around 700 m a.s.l. were, on average, predicted to be about 150 m higher in elevation and the creek plots at 900 m a.s.l were predicted to be about 100 metres higher. So it appears that ant assemblages along the creek are more like those from higher elevations along the ridge. There may be several explanations for this, but we strongly suspect that it is due to relatively lower temperatures along the creek resulting from the down-slope flow of cooler air from higher elevations. Regardless of the reasons, this result suggests that creek lines have the potential to act as thermal refugia for species restricted to high altitudes as they may be able to persist for longer along creeks in the face of rising temperatures.

Why is the ant fauna at the 1100 m plots so different from the rest of the transect?
As pointed out earlier, the ant fauna at the highest elevation (1100 m) is dramatically different from that at other elevations, being characterised by low numbers of species and individuals as well a number of high altitude specialists. What factors might be responsible for the distinctiveness of the 1100 m ants, especially when compared to the ants at 900 m? Environmental data collected from all of the IBISCA plots show that the drop in temperature between the 900 and 1100 m plots is in the same order as the drop between the 700 and 900 m plots, so temperature alone doesn't appear to explain the pattern. We suspect that the low numbers of ants at the 1100 m plots is due to high soil moisture levels which may inhibit ground- and litter-nesting ant species. Soil moisture measurements taken in March 2008 showed an increase in soil moisture with increasing altitude with a dramatic jump in moisture levels between the 900 and 1100 m plots, mirroring the pattern of ant assemblages. Recent soil moisture measurements taken at the 700, 900 and 1100 m plots by Sarah Maunsell as part of her honours thesis on springtails confirm that soil moisture at the 1100 m plots is not only higher than at 900 m but relatively stable through time.

The high soil moisture levels at the 1100 m plots are most probably maintained by high levels of cloud cover occurring at the highest elevations at Lamington. This cloud cover not only increases rainfall and reduces evaporation but contributes to higher soil moisture through cloud-stripping, the condensation of moisture onto vegetation which then drops to the forest floor. The end result is a consistently wet soil and leaf-litter layer. The litter layer at the 1100 m plots is so moist that terrestrial ostracod crustaceans and chironomid fly larvae were frequently found in their leaf litter extracts. The distinctive *Nothofagus* dominated forest found at the highest elevations at Lamington National Park is basically a cloud forest. In contrast to the ants, the stable and high moisture regime at the 1100 m plots favours a variety of invertebrate taxa, including a number of regional endemics.

What might the future hold for ants at Lamington?
Increasing temperatures are likely to cause ant species to shift their distributions upslope. However, given that relatively few species appear confined to the highest elevations, the short-term impacts on ant diversity may be small. However, the 'flow-on' effects may be of more concern. One predicted consequence of higher temperatures is that the elevation at which clouds commonly condense is likely to rise, which may reduce the amount of cloud-stripping occurring at the highest elevations. This may result in the progressive drying of the soil and litter allowing a suite of litter-inhabiting ant species, present at lower elevations, to invade the cloud forest. Consequently, the distinctive assemblages of other invertebrate groups found at the highest elevations, already affected by drier and warmer conditions, may also have to cope with an influx of new ants, although this is purely speculative.

Acknowledgements
Roger Kitching (project leader), David Putland, Heather Christensen and all other IBISCA support staff and volunteers are thanked for their assistance during the project. Susan Wright, Geoff Thompson and Anna Marcora (Queensland Museum) are thanked for their huge efforts in conducting the ant sampling. Thanks to Sarah Maunsell for access to her soil moisture data and Sarah Boulter for commenting on an earlier draft. Financial assistance was provided by a Queensland Government Smart State Grant, Griffith University, the Queensland Museum, Queensland Herbarium, SEQ Catchments Network and the Global Canopy Programme.

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Questions and Answers

Question: Could there be a shift to nocturnal activity?
Chris Burwell: Some species are both day and night active, and may be capable of becoming purely nocturnal.

Don Sands: Do you have any idea of how the species assemblage at the lowest elevation compares with that in coastal rainforest?
Chris Burwell: The coastal strip was not included because of lack of suitable habitat. Tallebudgera and Burleigh were suggested by members, but considered too isolated and small. Boombana at 400m in Brisbane Forest Park was included in the QM Terrestrial Invertebrates Survey, and had a similar species assemblage to that at the IBISCA lowest elevation.

Geoff Monteith: Elevations of sites at IBISCA ranged from the true elevation by quite a bit. Did the analyses take that into account?
Chris Burwell: Yes in most analyses, and in all analytical predictions of species assemblages.

Noel Starick: Does the presence or closeness of water at a site affect the temperature and thus the ant species present?
Chris Burwell: Steve Williams work indicated that there was a predicted relationship between species assemblages and temperature profiles, but data loggers showed a 15% error, and creek lines a 5% error.

Justin Bartlett: Do the ant indicator species show any direct relationships with plant species?
Chris Burwell: Not that are known; some ants have prey preferences, but none of the indicator species have any direct relationships with plants.

Vote of thanks was given by Don Sands.

Chairman's closing statement:
The next meeting will be held at this venue on Monday, 14th December, 2009 at 5.00pm with **Notes and Exhibits** followed by the **end of year BBQ**. Cost will be $5 per head with drinks able to be purchased from the fridge.

Notice of Next Meeting

MONDAY 14th DECEMBER

5pm **NOTES AND EXHIBITS**

6pm **end of year BBQ**

CSIRO
Long Pocket Laboratories
Large Conference Room
120 Meiers Road
Indooroopilly

BBQ costs $5/person

drinks will be available for purchase

ALL WELCOME
please sign in at Entomology reception

People and Projects

News from USDA ARS Australian Biological Control Laboratory

Anne-Marie McKinnon and **Celine Clech-Goods** were welcomed into the team in October as casuals to cope with the increased workload of several new projects. **Bradley Brown** and **Ryan Zonneveld** have started and exploration program on an interesting new target, the tree fern *Cyathea cooperi*, which is becoming a significant weed in Hawaii. **Matthew Purcell** recently visited China and met with collaborators from the Chinese Academy of Sciences and USDA ARS in Wuhan, Hubei Province. He then travelled throughout Hunan and Guangxi Provinces searching for biological control agents of several important weed species, both terrestrial and aquatic, and then joined **Jeff Makinson** in Hong Kong to conduct further surveys.

ENTOMOLOGISTS IN ACTION

In this edition …….

Queensland Museum Entomology

Queensland Museum will celebrate 150 years in 2012. We currently have about 1.5 million insects in our collection, with specimens dating back until at least the 1870s. The collection grows at the rate of about 20,000 new pinned specimens every year. Entomology has four permanent staff, two curators and two collection managers, who work with a large team of part-time staff, volunteers, honoraries and research associates.

Sarah Boulter
Sarah is a final year PhD student from Griffith University. She has collaborated closely with members of the Queensland Museum entomology team on the IBISCA Qld project, including many hours at the museum helping sort flies into family groups. Her PhD project has looked at the natural variability of flower visiting and pollinator insects in Lamington National Park, with many more hours spent at the museum using the collection to help identify beetles.

Chris Burwell
Chris has worked in the insect section of the Queensland Museum since mid 1995 and has climbed the corporate ladder to the heady level of Senior Curator. He also did work experience at the Queensland Museum in year 10 of high school, way back in 1982. For the last three years Chris has also had a 20% co-appointment with the Griffith University School of Environment. Chris's main research interests are in the Hymenoptera (bees, wasps and ants). His PhD thesis was on the taxonomy and biology of small parasitic wasps in the family Eulophidae. However, in the last 5 years or so his focus has shifted towards ants and he has an increasing interest in their biology and ecology, thanks largely to the efforts of Aki Nakamura. Recent projects include investigating the potential of ants as bio-indicators of climate change, as part of the IBISCA Queensland project (see the article in this issue) and examining the impacts of invasive ants on coral cays in the southern Great Barrier Reef. Chris also pursues research in to the feeding ecology of insectivorous vertebrates with long-time collaborator Chris Pavey.

Bryan Cantrell
Bryan is a QM Honorary Associate and is normally "in" each Thursday. His interests lie in muscoid flies, particularly Tachinidae and to a lesser extent the muscids, calliphorids and sarcophagids. He looks after this part of the collection as well as identifying relevant survey material such as the IBISCA research program in Lamington National Park and the more recent survey of the Capricornia Cays off the central Queensland coast. Bryan is collaborating with Chris Burwell in targeted research projects in tachinid taxonomy, carrying on his research interest from the time he worked in the DPIF Insect Collection some years ago. He is willing to identify tachinids for fellow entomologists, especially reared specimens with host data.

Tony Ewart
Tony is a retired Professor, Department of Earth Sciences, UQ. He has a long term interest in cicada taxonomy and behaviour; having published many papers describing new species. Tony has worked in the Entomology section for many years building up

our cicada collection. His main aim has been to not only document our Queensland cicada fauna, but to aurally record and analyse their species specific songs, an invaluable tool in recognising the many species complexes.

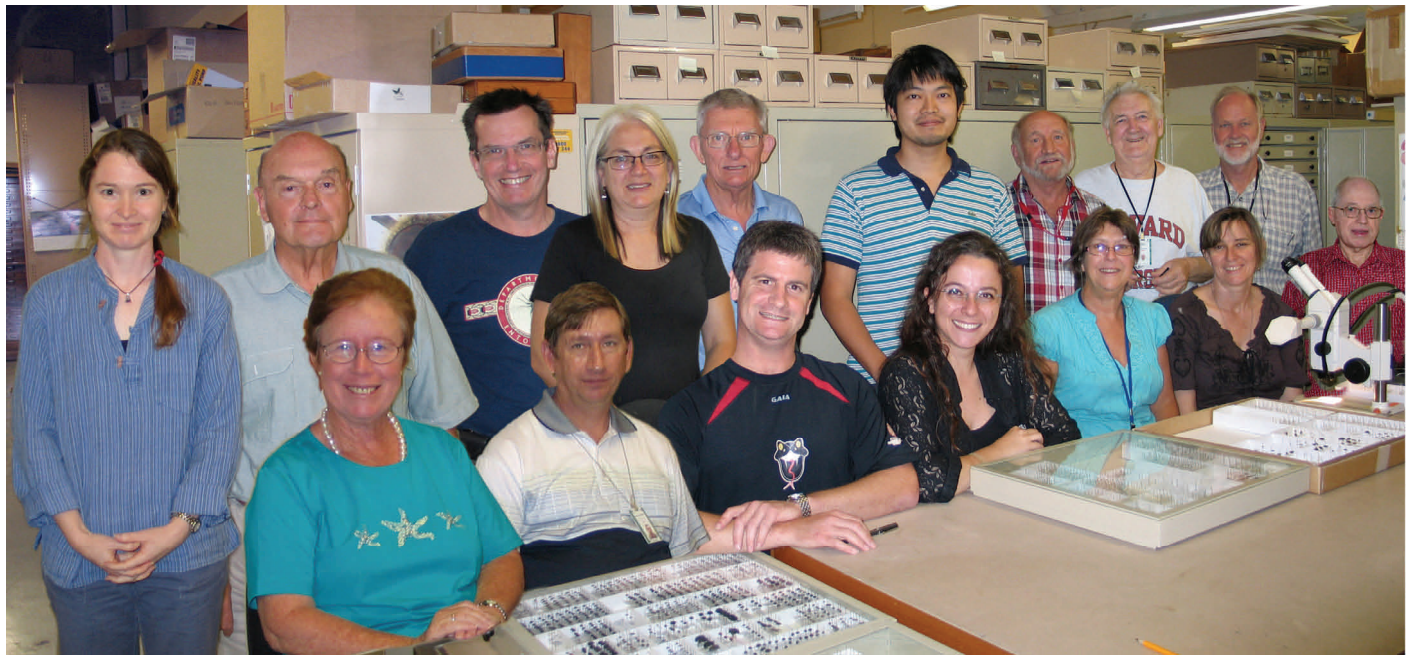
Gail Irwin
Another one of our invaluable volunteers, Gail's background is as a Teacher aid. Now retired, she comes in once a week and helps with databasing, registration, pinning and other general tasks to do with collection maintenance.

Karin Koch
Karin started at the museum in 1993, as a volunteer working for Geoff Monteith until she let it slip that she knew how to use R-base and has since been working as a casual mostly with our databases. Prior to starting at the museum she worked for approximately 10 years at DPI Long Pocket in the stored grains lab in Entomology working mostly on pesticide testing for use on stored products. She has had a large hand in databasing all of our dung beetles, carabids and is now in the throes of databasing all of our ants.

Rudy Kohout
Rudy was born in former Czechoslovakia in 1933. He came to Australia in 1968 and soon joined ANIC in Canberra. He worked there as a Taxonomic Illustrator and later as an assistant to Bob Taylor. There he become interested in the Australian *Polyrhachis* ants and actively continued taxonomic work on the genus after he joined the Queensland Museum in Brisbane in 1974. Following his retirement in 1994, Rudy was appointed to the position of Honorary Research Fellow and his interest widened to cover the whole world fauna of the genus. He joined the ANeT (International Network for the Study of Asian Ants) and collected widely throughout Australia, New Guinea and south-east Asia. With the help of several travel grants from Harvard University, Smithsonian and the Australian Entomological Society, Rudy travelled to Europe and USA to study the type material lodged in the numerous museums and institutions. His taxonomic support to workers on ecology and behaviour of these interesting ants was acknowledged at the recent International Conference in India, where he was honoured for contribution to the field of Asian Myrmecology. Rudy published a number of papers on the taxonomy of *Polyrhachis*, with the reviews of the Australian fauna presently in progress.

Chris Lambkin
Chris has been a Curator of Entomology at the QM since 2006 and is responsible for the collections of flies, beetles, grasshoppers, bugs, stick insects, and other 'Lower' insect orders. While at the QM Chris has included flies in biodiversity assessments such as the IBISCA Queensland project in Lamington NP, Pest-Off in the Capricornia Cays, Hilliards Creek of Redlands City Council, Great Basalt Wall NP in north Qld, and the Biodiversity Blitz project in WA, NSW and Qld. Her main research interest is the systematics, evolution, and biodiversity of Diptera, specialising in combined molecular and morphological analyses and monographic revisions of bee flies and stiletto flies. Chris is also completing work on the large international initiative, FLYTREE, in the American NSF Assembling the Tree of Life program, analysing the first comprehensive morphological character set for fly families to provide a framework for testing evolutionary hypotheses critical in comparative studies of dipteran development, behaviour, genomics, and neurobiology.

Geoff Monteith
Geoff was a curator of insects at the Queensland Museum for 30 years until his retirement in 2008. He still haunts the corridors in the capacity of Honorary Research Associate and he continues his long-term interest in dung beetles, carabid beetles, aradid bugs and in rainforest insects generally. He is enjoying a fair bit of fieldwork in retirement somewhat unhindered by the full constraints of bureaucratic processes.



Back Row, left to right: Susan Wright, Tony Ewart, Geoff Thompson, Karin Koch, Bryan Cantrell, Aki Nakamura, Noel Starick, Rudy Kohout, Geoff Monteith

Front Row: Gail Irwin, Darryl Robinson, Chris Burwell, Federica Turco, Chris Lambkin, Sarah Boulter, John Purdie.

Akihiro Nakamura
Aki recently graduated with a PhD from Griffith University under the supervision of Carla Catterall, Roger Kitching and Alan House. He has been working for Chris Burwell as a research assistant since he finalised his PhD thesis in 2007. During the last two years he has been working on a number of research project including IBISCA Queensland altitudinal transect study in Lamington National Park and invertebrate surveys of coral cays in the Capricornia Cays National Park. Aki's interests span a wide range of ecological issues including community ecology, restoration ecology and invertebrate ecology with particular interest in ants. Aki grew up in Japan but left his country, after completing his high school degree, for more adventurous life in Australia!

John Purdie
John began volunteering with the QM in November 2000 at the Museum of Tropical Queensland, Townsville, and from October 2002 has continued in this capacity at the Queensland Museum, South Brisbane. In Townsville John worked replacing pins in the Harris Butterfly and Moth collection, and while we have yet to use these talents he has been invaluable in the general collection maintenance here in Brisbane. John has a wealth of experience as a ranger with Northern Territory Parks and Wildlife services and, since retirement, as a volunteer in the entomology section of the Museum and Art Gallery of the Northern Territory. He has a special interest in tiphiid wasps.

Darryl Robinson
Darryl is one of our long-term volunteers and is equally important in keeping the ento collection running smoothly. An endlessly cheery chap, Darryl is stuck with many of our thankless, but none–the-less essential, jobs such as cutting up labels, creating tags for minute insects, topping up alcohol, preparing field gear and preparing drawers to house the ever expanding collection.

Noel Starick
After 28 years with CSIRO Entomology in Canberra, Noel retired and is now a volunteer at the Queensland Museum, where he is heavily involved in fieldwork and uses his vast entomological knowledge to sort material from biodiversity assessments.

Geoff Thompson
Geoff has worked at Queensland Museum for nearly 28 years, originally as a technician but now as a collection manager. Half his time is still designated to assisting with research and other projects. His special interest is insect image making, as an illustrator since 1975 but now mostly producing edited, high-depth-of-field photographs. Geoff is currently photographing ants for the Capricorn Cays survey. He is also curating the re-display of the Dodd Collection (opening 13th February at Qld Museum South Bank). He is also attempting to master using Vernon (software) for loans and registrations, in addition to writing a few web pages.

Federica Turco
Federica has been working on beetles since her degree in Rome in 2001. Her main entomological interest has been blister beetles (Meloidae), and secondarily ripiphorids (www.faunaeur.org) and carabids. In collaboration with Christine Lambkin (QM) and Adam Slipinski (CSIRO), Fede is currently working on an ABRS funded project on the taxonomy of Australian Zopheridae (including Colydiidae); this also involves work on the phylogeny and biogeography of four Southern distributed genera. Other projects include a revision of Australian blister beetle genera with Marco Bologna (Italy) and John Pinto (USA), as well as a revision of Australian *Macrosiagon* (Ripiphoridae) with Jan Batelka (Czech Republic).

Susan Wright
Beginning as a technical assistant, Susan has worked with the museum's insect collection for the last 13 years. Her position has since changed to a Collection

Management role, and she is now in charge of the 'Higher' insect section of the collection, i.e., most of the groups that fly (except for Diptera as they are obviously Christine's first choice). Prior to starting at the museum Susan completed a Bachelor of Science, majoring in Entomology, through the University of Queensland; after which she went on to do an honours project on the taxonomy and biology of Syrphini: Syrphidae (hoverflies). It was during this time that her interest in insect collections and taxonomy was initially sparked while working part-time at the University of Queensland Insect Collection (UQIC), with Margaret Schneider, during her degree. She is currently working on QM's new web pages, creating expansion room for large parts of the collection and getting our new database and loans system into order.

Notices

Expression of interest: offer of timber insect cabinets in exchange for volunteer hours

The Queensland Primary Industries & Fisheries (QPIF; formerly DPI) Entomology Collection is relocating to Boggo Road, South Brisbane, in early 2011, and needs to find homes for a large number of solid cedar insect cabinets. The cedar cabinets (measuring 59cmW x 132cmH x 53cmD) have a lockable door and 14 timber drawers, each with a naphthalene moat (see photo). QPIF cannot sell the cabinets, but are offering suitably experienced volunteers the opportunity to work a predetermined number of hours in exchange for one or more cabinets. The work will involve assistance with the following tasks: transfer of unit trays (containing specimens) from old, to new, draws; and, removal of naphthalene from steel cabinet draws.

The length of volunteer time required in return for a cabinet has not been determined at this stage as it will likely be based on the number of volunteers available to us. It is clear though that it will be reasonable and will be based on a diminishing scale for multiple cabinets (i.e. significantly decreased number of hours required to get additional cabinets after the first one). The timeline for the move of the collection from the old cabinets to new drawers will be approximately 14 months from January 2010, so there is plenty of time to accumulate the hours required for one or more timber cabinets. **Steel cabinets are NOT being offered** to volunteers as these will be reused by QPIF at the new Boggo road facility. **Entomological specimens are NOT being offered** (only empty timber cabinets).

The opportunity is open to anyone with suitable experience handling insect and/or delicate museum specimens, although the right of refusal is reserved. Current Queensland Government employees should declare there employment status and must accumulate any volunteer hours outside their regular working hours.

An expression of interest is required with the following details (by letter or email):

- Name and contact details.
- Short note describing your previous specimen handling experience (official or unofficial).
- Any societal affiliations.
- Number of cabinets wanted (tentatively).
- Name and contact details of a referee who can confirm your previous experience handling insect specimens.

Please register your interest with the Collection Manager, Desley Tree
desley.tree@deedi.qld.gov.au
QPIF Entomology
80 Meiers Rd
Indooroopilly
Qld 4068

NOTE: the QPI&F Entomology Collection will be closed for loans from early 2010 until completion of the relocation to Boggo Rd in early 2011.

One example of a 14-drawer timber cabinet at the QPIF Entomology Collection (the cabinets in the collection vary in style and timber colour).

Nominations for 2010 Office Bearers of the Entomological Society of Queensland

Members are invited to use the following form to nominate office bearers for the Entomological Society of Queensland Inc. for 2010

Nominations should be sent via email, fax or post and be referred to the:

Secretary, Entomological Society of Queensland

PO Box 537, Indooroopilly QLD 4068

Please return forms by the end of January 2010.

A list of nominations received will be circulated in Issue 10 of the News Bulletin, and an election held at the Annual General Meeting in March 2010. In the absence of a nomination for any particular office, the president may receive nominations at the Annual General Meeting.

Positions to be filled are as follows:

- Senior Vice President
- Honorary Secretary
- Honorary Treasurer
- News Bulletin Editor
- Councillors (3 positions)

The Entomological Society of Queensland functions effectively because members play an active part in the Society. All members are encouraged to nominate for positions on the Council of the Society. If you want to know more about any of the Council positions, please contact one of the existing Council members listed on the back cover of the News Bulletin.

Office Bearer Nomination Form 2010

I nominate (name)

……...……

For the position of

- Senior Vice President
- Honorary Secretary
- Honorary Treasurer
- News Bulletin Editor
- Councillor

on the Council of the Entomological Society of Queensland Inc.

Nominated by

……...……

Seconded by

……...……

I accept the nomination

……...……
(nominee signature)

Entomological Society of Queensland 2010
$250 Student Award

This is an award by the Society to encourage entomological research. Entries are judged by a panel of 3 entomologists appointed by the President of the Society. The winner will be announced at the May General Meeting and is then invited to present a summary of their research at the June Notes and Exhibits meeting of the Society.

Honours, Diploma and 4th year Degree students who received their qualification from any Queensland tertiary education institution in 2008 or 2009 may submit their entomology based thesis or report for consideration.

Entrants need not be Society members.

These reports can be directed to the Society's Senior Vice President at the address listed on the entry form. However, please note that a hard copy of your thesis/report does not need to be submitted, and the submission of a PDF version is encouraged. This should be emailed together with a signed copy of the completed entry form to Christine Lambkin at christine.lambkin@qm.qld.gov.au

Closing date for submissions is Friday 9th April 2010

Student Award Sponsors:

Tropical Fruit Fly Research Group, Griffith University

Entomological Society of Queensland
2010 Student Award Entry Form

Name

_____

Title of thesis or report

_____

_____

_____

Degree

_____

Supervisor

_____

Date of Examiners report or grading

_____

Return address for thesis/report (if applicable)

_____

_____

Signature_____ Date_____

Send in your thesis/report with a signed and completed entry form to:
Christine Lambkin
President of the Entomological Society of Queensland
Queensland Museum
PO Box 3300,
South Brisbane, QLD 4101
Fax: 07 38461226

Nomination for membership of the Entomological Society of Queensland

Title____ Initials_____Preferred name _____

Surname_____

Address_____

_____

_____ Postcode _____

email_____@_____

Nominated by_____

Seconded by_____

☐My cheque/money order is enclosed

☐Please charge my credit card
☐ Bankcard ☐ Visa ☐ Mastercard

Name on card_____

Expiry date___/___signature_____

☐ I would like a receipt

☐ general membership $30.00
☐ joint membership $36.00 ☐ student membership $18.00

I would like to receive the bulletin by
☐ normal mail (Australia Post) ☐ e-mail as a PDF file

Return to
Honorary Secretary,
Entomological Society of Queensland
P.O. Box 537
Indooroopilly 4068
Queensland

DIARY DATES 2009

Meetings held 2nd Monday of the month
(or Tuesday if Monday is a public holiday)

MAR—Monday 9th	Dr Mike Furlong (UQ)	AGM & Presidential Address
APR—Tuesday 14th	Nate Hardy (QPIF)	Mealybug Classification
MAY—Monday 11th	Mary Whitehouse (CSIRO Narrabri)	From Lynx Spider to Cotton
JUN—Tuesday 9th	Student Award and Notes & Exhibits	Notes and Exhibits session
AUG—Monday 10th	Perkins Memorial Lecture: Professor Gerry Cassis (UNSW) and BBQ	Planetary Biodiversity Inventory and Systematics of Australia's True Bugs
SEP—Monday 14th	Trevor Lambkin (QPIF)	The Butterflies of Torres Strait
OCT—Monday 12th	Myron Zalucki (UQ)	Pest Population Dynamics
NOV—Monday 9th	Chris Burwell (QM)	Ants as bioindicators of climate change
DEC—Monday 14th	Notes & Exhibits and BBQ	

SOCIETY SUBSCRIPTION RATES

GENERAL:	Person who has full membership privileges	**$30pa**
JOINT:	Residents in the same household who share a copy of the *News Bulletin*, but each otherwise have full membership privileges.	**$36pa**
STUDENT:	Students and others at the discretion of the Society Council	**$18pa**

Student membership conveys full membership privileges at a reduced rate.

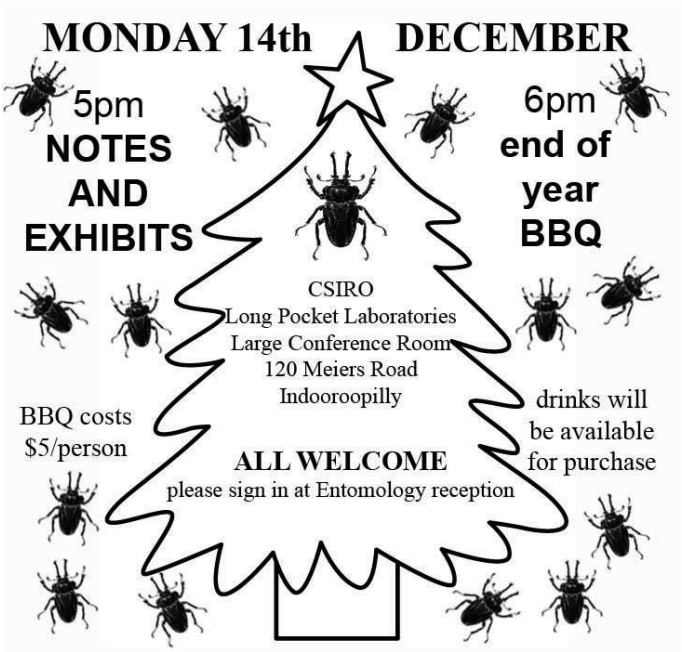
THE *AUSTRALIAN ENTOMOLOGIST* SUBCRIPTION RATES

AUSTRALIA:	Individuals	**A$25pa**
	Institutions	**A$30pa**
ELSEWHERE:	Individuals	**A$35pa**
	Institutions	**A$40pa**

Subscriptions should be sent to the Business Manager,
The Australian Entomologist PO Box 537, Indooroopilly QLD 4068.

THE ENTOMOLOGICAL SOCIETY OF QUEENSLAND

NEXT MEETING



NEXT NEWS BULLETIN

Volume 37, Issue 9, December 2009
due early January

CONTRIBUTIONS WELCOME

Send your news/stories/notices to the editor
(justin.bartlett@deedi.qld.gov.au)
by Friday 18th December