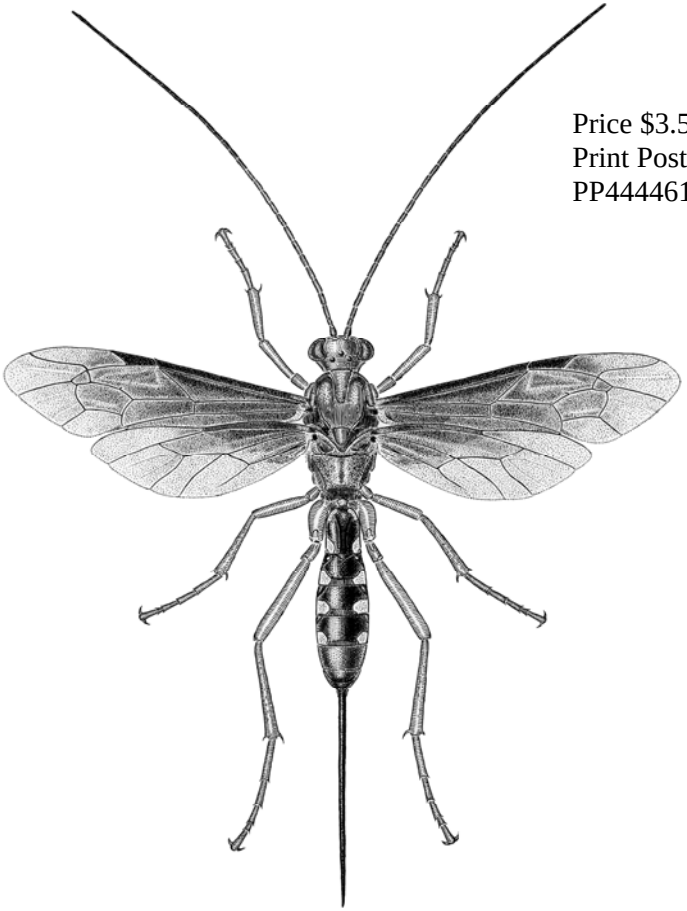
ENTOMOLOGICAL SOCIETY OF QUEENSLAND INC

NEWS BULLETIN



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THE ENTOMOLOGICAL SOCIETY OF QUEENSLAND

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Front Cover Illustration: Ink illustration by William Manley of a female *Lissopimpla excelsa* (Costa, 1864) (Hymenoptera: Ichneumonidae: Pimplinae), a parasitic wasp (image copyright Qld Department of Agriculture, Fisheries & Forestry).

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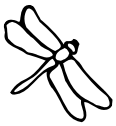


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The **ENTOMOLOGICAL SOCIETY OF QUEENSLAND INC.**, since its inception in 1923, has striven to promote the development of pure and applied entomological research in Australia, particularly in Queensland. The Society promotes liaison among entomologists 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 Tuesday of each month (March to June, August to December). 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.

Minutes of General Meeting

Held in the Seminar Room, Ecosciences Precinct, Boggo Rd, Dutton Park, Tuesday May 14th at 1.00pm.

Chair: Simon Lawson

Attendance: Kathy Ebert, Simon Lawson, Ross Kendall, Desmond Foley, Alexandra Glauerdt, Brenton Peters, Cate Paull, Andrew Hayes, Leon Hugo, Geoff Monteith, Trevor Lambkin, Matthew Purcell, Bradley Brown, Lance Maddock, Helen Schwencke, Kathy Thompson, Penny Mills, James McCarthy

Visitors: Barry Ale, Susan House, James Fish

Apologies: Judy King, Dave Merritt, Julianne Farrell, Morris McKee, Federica Turco, Geoff Thompson, Chris Moeseneder, Bill Palmer

Minutes: The minutes of the April Meeting were circulated in News Bulletin Vol. 41 Issue 2, May 2013.
Moved the minutes be accepted as a true record: Simon Lawson, *seconded:* Bradley Brown, carried: unanimously

Nominations for Membership:
The following nominations for Membership were received and approved by Council, and are put forward for election:

General Membership:
Susan House, Karana Downs 4306, *nominated by* Andrew Hayes, *seconded by* Simon Lawson.
Bernard Crow, Innisfail 4860, *nominated by* Geoff Monteith, *seconded by* Kathy Ebert
Cate Paull, West End 4104, *nominated by* Bradley Brown, *seconded by* Matthew Purcell.

All new members were elected unanimously

General Business

Winner of the Student Award: Andrew Maynard from the University of Queensland. Andrew will present his work and receive his award at the next meeting in June. His thesis was entitled "Understanding bioluminescence synchronisation displayed by larvae of *Arachnocampa tasmaniensis*: A behavioural and phylogenetic approach".

Main Business

Plant responses to herbivory: complex interactions between parasitoids, predators and prey

Mike Furlong, Rehan Silva and Gurion Ang, School of Biological Sciences, The University of Queensland, St Lucia

Plants respond biochemically to herbivore attack and these induced responses are widely considered to constitute a form of defence. For example, herbivore feeding can induce the production of plant volatiles (HIPVs) and reduced rates of attraction of herbivores to damaged plants have been cited as evidence of a defensive role for these compounds. However, the responses of herbivores to herbivore-induced plants are highly variable and recent work shows that herbivore induction reduced oviposition on damaged plants in only 54% of published studies (Silva *et al.*, 2013).

In order to investigate the generality of the responses of herbivores to herbivore- induced changes in plants we compared the responses of two species of congeneric thrips (*Frankliniella schultzei* Trybom and

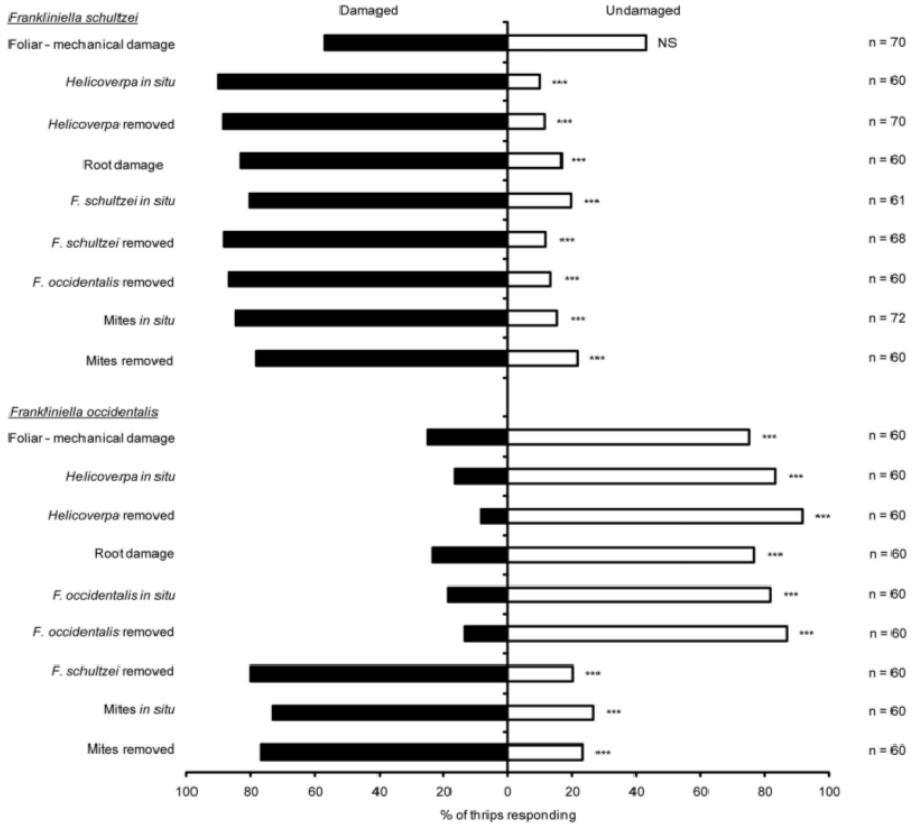

Figure 1. Responses of two congeneric thrips species, *F. schultzei* and *F. occidentalis*, to various forms of herbivory inflicted on cotton seedlings. NS – not significant, *P<0.05, **P<0.01, ***P<0.001. doi:10.1371/journal.pone.0063611.g001 (after Silva *et al*. 2013).

F. occidentalis Pergande) to undamaged cotton seedlings and cotton seedlings that were damaged by diverse insect herbivores from different feeding guilds. While *F. schultzei* was more attracted to cotton seedlings damaged by all herbivores tested (Fig. 1), *F. occidentalis* was more attracted to undamaged seedlings, except when seedlings were damaged by mites (Fig 1). Both thrips species are also predators of mite eggs and respond positively to plants damaged by their prey (Fig 1). Herbivore-induced plant interactions become more intricate when herbivore natural enemies are also considered and this work adds to the considerable body of evidence that indicates that predators and parasitoids exploit HIPVS to locate prey.

Indirect plant defences against herbivory rely on parasitoids exploiting HIPVs to locate their herbivore prey (Fig 2). The specificity of these volatile cues has long been debated and we studied the responses of *Diadegma semiclausum* (Hymenoptera: Ichneumonidae) to cabbage plants induced by caterpillars of its host, the crucifer specialist *Plutella xylostella* (Lepidoptera: Plu-

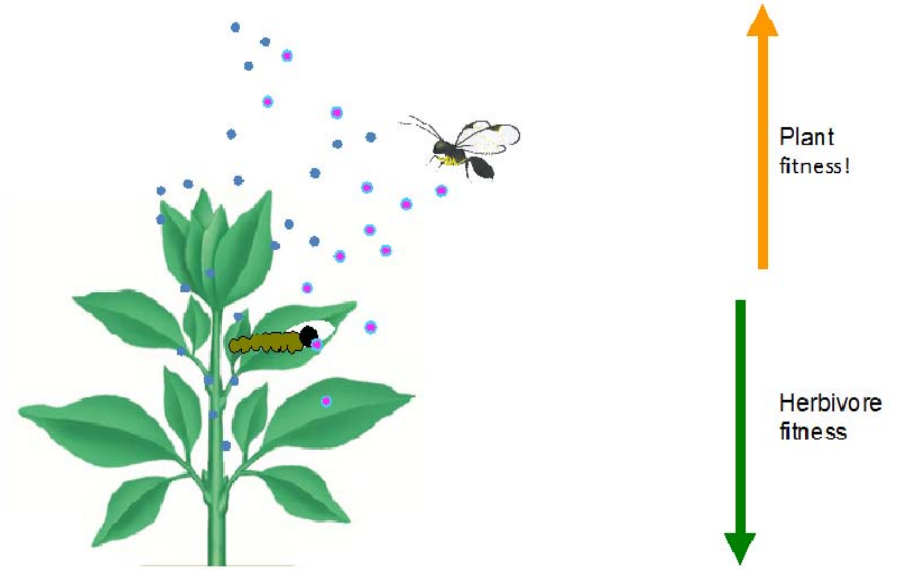

Figure 2. Tri-trophic interaction at the core of parasitoid mediated indirect plant defence. Parasitoids respond to blends of HIPVs emitted by plants following insect attack and use these cues to locate their prey.

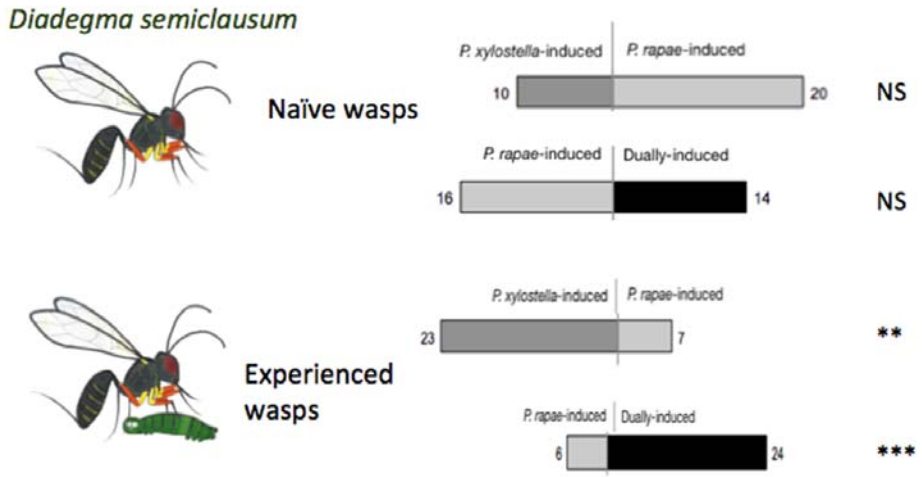

Figure 3. Responses of naïve and host-experienced *Diadegma semiclausum* (Hymenoptera: Ichneumonidae) to cabbage plants induced by host (*Plutella xylostella*) or non-host (*Pieris rapae*) larvae; NS P>0.05, **P<0.01, ***P<0.001. (Adapted from Ang, 2013).

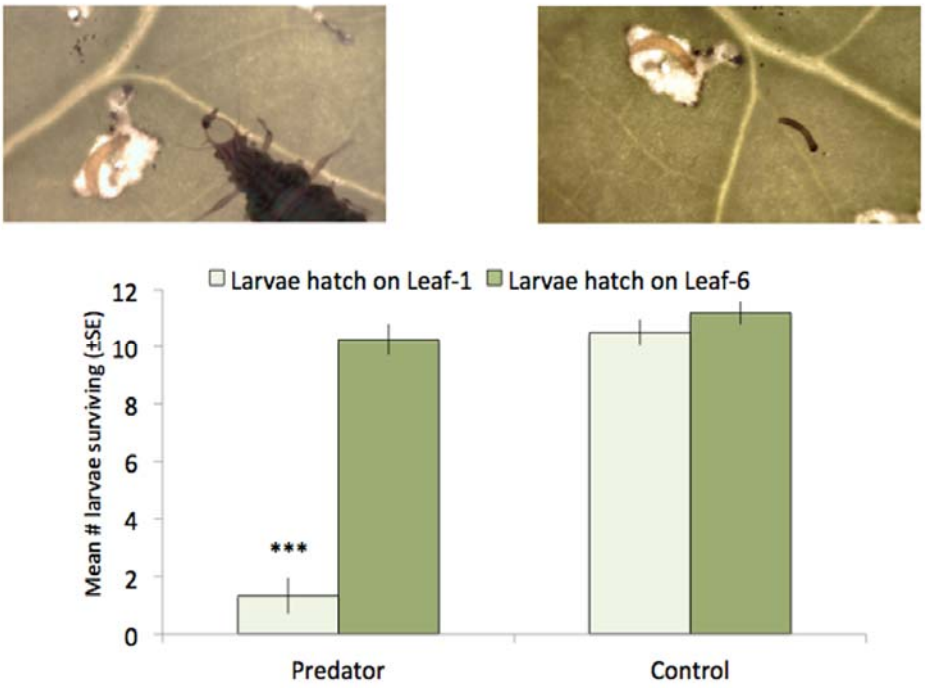

Figure 4. Survival of *Plutella xylostella* neonate larvae is significantly reduced when they hatch from eggs laid on lower leaves (leaf-1), the preferred oviposition site in intact (non-induced) cabbage plants, in the presence of predators (*Mallada signata* (Neuroptera: Chrysopidae) compared with when they hatch on upper leaves (leaf-6), the preferred oviposition site in herbivore attacked (induced) cabbage plants, *** P<0.001.

tellidae), and by caterpillars of a non-host, *Pieris rapae* (Lepidoptera: Pieridae).Naïve wasps that had not previously experienced *P. xylostella* larvae on cabbage plants did not discriminate between the volatile profiles emitted by plants infested with these herbivores (Ang 2013, Fig 3). However, following the experience of a single oviposition event into its host on a cabbage plant, *D. semiclausum* showed a significant preference for plants induced by its host caterpillar (Ang 2013, Fig 3.), demonstrating the importance of associative learning, rather than innate responses to specific volatiles, in this system.

The effects of HIPVs on herbivore and predator behaviour have been less extensively studied than their effects on parasitoid behaviour. *Plutella xylostella* typically lays its eggs on the lower leaves and stems of undamaged cabbage plants and neonate larvae must move considerable distances to reach the preferred feeding sites on leaves near the top of plants (Silva and Furlong 2012). Larval feeding induces the release of HIPVs from these upper leaves. These cues are exploited by female *P. xylostella* and eggs are laid near preferred feeding sites at the top of plants (Silva and Furlong 2012). This change in oviposition pattern results in

neonate larvae finding feeding sites and establishing protective leaf mines more rapidly than on intact, non-induced plant and results in significantly higher survival in the presence of predators (Fig. 4).

Plant-herbivore interactions are complex and unpredictable. Their complexity increases further at the third trophic level where chemical cues can be used by predators and parasitoids to locate prey or they can be exploited by herbivores to reduce the risk of predation.

References

Ang, G. C. K. 2013. Herbivore and parasitoid behavioral responses to herbivore-induced changes in host plants over time. Honours Thesis, The University of Queensland, St Lucia.

Silva R, Furlong MJ (2012) Diamondback moth oviposition: effects of host plant and herbivory. *Entomologia Experimentalis et Applicata* **143**: 218–230.

Silva R, Furlong MJ, Wilson LJ, Walter GH (2013) How Predictable Are the Behavioral Responses of Insects to Herbivore Induced Changes in Plants? Responses of Two Congeneric Thrips to Induced Cotton Plants. *PLoS ONE* **8(5)**: e63611. doi:10.1371/journal.pone.0063611

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Vote of thanks: Bradley Brown

Any other business:

Notes and Exhibits meeting, Tuesday, June 11. Please contact Simon Lawson if you would like to contribute – we welcome speakers.

People and Projects

Appeal for Lucanidae specimens for conservation display in The Netherlands

Hendrik Hoogeveen, co-ordinator of "Bio-Visie Natuureducatieve Projecten" is appealing for specimens of Australian Lucanidae for a display on the endangered European stag Beetle, *Lucanus cervus*. The group is trying to raise awareness of *Lucanus cervus,* whose existence in the Netherlands is uncertain. The Dutch government has granted the group permission to display specimens of endangered species.

Hendrik says "The exhibition will focus on the life and problems of Lucanus cervus, but in order to embed this species in the big picture it is necessary to show biodiversity. Therefore a lot of different specimens of Lucanidae species from all over the world are needed. And to show gender differences of each species a male and female specimen is necessary."

Hendrik has been made aware of Australia's wildlife export laws and has contacted Department of Sustainability, Environment, Water, Population and Communities.

He believes he will qualify for a permit but will need to know species names and numbers before a permit can be issued.

Members able to supply specimens should contact Hendrik direct at biovisie@ upcmail.nl. Hendrik will then arrange an export permit.

Entomological Society of Queensland 2013 $500 Student Award

This year's Student award winner, Andrew Maynard from University of Queensland, will receive his award from the president and give a short presentation on his winning thesis, entitled "Understanding bioluminescence synchronisation displayed by larvae of *Arachnocampa tasmaniensis*: A behavioural and phylogenetic approach".

NOTICE OF NEXT MEETING

Tuesday 11th June 2013, 1pm

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Notes and Exhibits
&
Student Award Presentation

Seminar Room 1
Ground Floor, Ecosciences Precinct
Boggo Road, DUTTON PARK

ALL WELCOME

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Nomination for Membership Form

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DIARY DATES 2013

Nine general meetings held per year on the 2nd Tuesday of the respective month

MAR—Tuesday 12th	Geoff Thompson	AGM and President's Address
APR—Tuesday 9th	Michael Ramsden	*Sirex* wood wasps in Queensland
MAY—Tuesday 14th	Dr Mike Furlong	Plant responses to herbivory: complex interactions between parasitoids, predators and prey
JUN—Tuesday 11th	Notes & Exhibits / Student Award Presentation	
AUG—Tuesday 13th	Dr. Doland Nichols	Bell Minor associated dieback of eucalypt forests
SEP—Tuesday 10th	Dr. Ken Walker	Perkins Memorial Lecture "Advancing Australian Biosecurity and Biodiversity through the web"
OCT—Tuesday 8th		
NOV—Tuesday 12th		
DEC—Tuesday 10th	Notes & Exhibits and Xmas 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. Student membership conveys full membership privileges at a reduced rate.	**$18pa**

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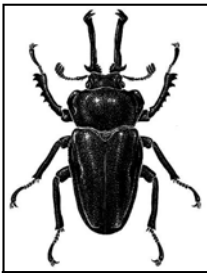

THE ENTOMOLOGICAL SOCIETY OF QUEENSLAND

NOTICE OF NEXT MEETING

Tuesday 11th June 2013, 1pm

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Notes and Exhibits
&
Student Award Presentation

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Seminar Room 1
Ground Floor, Ecosciences Precinct
Boggo Road, DUTTON PARK

More venue details available at
http://www.esq.org.au/meetings.html

ALL WELCOME

NEXT NEWS BULLETIN

Volume 41, Issue 4 (July 2013)

CONTRIBUTIONS WELCOME

DEADLINE - Wednesday July 24th, 2013
Send your news/stories/notices to the editor
(chris.moeseneder@csiro.au)