

## Presentation Abstracts

### Entomological Society of British Columbia Annual General Meeting, Pacific Forestry Centre, Victoria, B.C., Nov. 1-2, 2013

#### **Phylogenetics and natural history of the subfamily Tryphoninae (Hymenoptera: Ichneumonidae)**

A. Bennett, *Canadian National Collection of Insects, Agriculture & Agri-Food Canada, Ottawa, Ontario*

The Tryphoninae are a group of ectoparasitoid wasps that parasitize sawfly and Lepidoptera larvae. There are 1252 species in 59 genera worldwide. A morphological phylogenetic analysis was performed to examine their relationships. This analysis permits discussion of the evolution of adaptive characters and host associations.

#### **Bee talk: Do honeybees use the Earth magnetic field as a reference to align their waggle dance?**

V. Lambinet, M. Hayden, M. Bieri and G. Gries, *Departments of Biological Sciences and Physics, Simon Fraser University, Burnaby, B.C.*

Waggle-dancing honeybees recruit hive mates to a food source. Directional information is encoded in the angle between the waggle run line of the dancer and a reference line, predicted to be gravity or the geomagnetic field (GMF). Canceling the GMF around hives revealed no effect on the dancer's recruiting success.

#### **De novo transcriptome of *Megastigmus spermotrophus*: Hunting for mechanisms of host manipulation**

A. Paulson, S. Perlman, P. von Aderkas, *Department of Biology, University of Victoria, Victoria, B.C.*

*Megastigmus spermotrophus* (Hymenoptera: Torymidae) is a seed parasite of Douglas-fir, *Pseudotsuga menziesii*. Three highly expressed venom transcripts from females were identified in the transcriptome. One of these venoms, aspartylglucosaminidase, has been identified as a major venom constituent of two parasitoid wasps.

#### **Cyberbugs: Military and non-military research and applications**

A. Behennah, *1829 Laval Avenue, Victoria, B.C.*

Within the past 20 years, a series of experiments have attempted to hybridize insects with technology for military or security purposes. Hymenoptera were applied to the detection of explosives and land-mines, and electronics implanted into muscle and nerve tissues remade cockroaches, moths, and beetles into remote-controlled bio-robots.

#### ***Drosophila suzukii* in the *D. suzukii* world: Humidity decreases density-dependent competition**

C. Hodson, S. Dhanani, A. Hoi, A. Chubaty and F. Simon, *Department of Biological Sciences, Simon Fraser University, Burnaby, B.C.*

Humidity has been suggested to be important for *Drosophila suzukii* development; However, how it mediates competition has not been described previously. An examination of density-dependent competition under variation in humidity of *D. suzukii* suggests that high humidity reduces the consequences of competition at high densities.

#### **Transgenerational Effects on Disease Resistance in an Insect Herbivore**

G. Olson and J. Cory, *Department of Biological Sciences, Simon Fraser University, Burnaby, B.C.*

The western tent caterpillar undergoes dramatic population cycles that coincide with viral epizootics. Our research investigates how changes in dietary factors related to density altered disease resistance over two generations. Contrary to expectations, our findings indicate that dietary stressors may enhance disease resistance, leading to more disease-resistant populations.

**Web-reduction behaviour in black widows: A story of attraction, courtship, manipulation, and rivalry**

C. Scott, D. Kirk, S. McCann and G. Gries, *Department of Biological Sciences, Simon Fraser University, Burnaby, B.C.*

Western black widow females attract males with a silk-borne sex pheromone. During courtship, males often engage in ‘web-reduction’—dismantling and bundling up parts of the female’s web. We present data from a field experiment demonstrating that web-reduction functions to decrease web attractiveness, thereby limiting the arrival of male competitors.

**How to kill a parasite: Transcriptional responses in a *Drosophila* defensive symbiosis**

P. Hamilton, J. Leong, B. Koop and S. Perlman, *Department of Biology, University of Victoria, Victoria, B.C.*

Symbioses of insects can be critical to host defense. *Drosophila neotestacea* is defended against a nematode parasite by the bacterium *Spiroplasma*, but the mechanism of this defense is unknown. Transcriptome sequencing in this system shows that the production of toxins by *Spiroplasma* is the most likely cause of defense.

**Population dynamics of a tritrophic food chain in a warming world: A modeling approach**

M. Orobko, F. Simon and B. Roitberg, *Department of Biological Sciences, Simon Fraser University, Burnaby, B.C.*

We simulated varying levels of heat waves, along with predicted mean temperature increases, in a model of a tritrophic food chain with organisms whose performances were temperature-dependent. We found that heat waves could lead to an increased risk of extinction in these communities.

**Exploring the temporal and dose-dependent immune response to baculovirus in an insect**

J. Scholefield, I. Shikano, V. Fung, and J. Cory, *Department of Biological Sciences, Simon Fraser University, Burnaby, B.C.*

We exposed the cabbage looper, *Trichoplusia ni*, to different doses of a baculovirus, and measured the haemocyte

response at different time periods following exposure. Changes in haemocyte type and density could affect within-host competition with other pathogens. The changes have important evolutionary consequences for the evolution of virulence and insect population management.

**How do entomopathogenic fungi and parasitoids interact over a long term to control aphids in greenhouses?**

Y. Norouzi, J. Cory and D. Gillespie, *Department of Biological Sciences, Simon Fraser University, Burnaby, B.C., and Agriculture & Agri-Food Canada, Agassiz, B.C.*

*Beauveria bassiana* (strain GHA) in the commercialized form, BotaniGard, had a positive interaction with a parasitoid *Aphidius matricariae*. In the six-week period, the use of both biocontrol agents together resulted in fewer aphids and more parasitoid mummies on the plants than any of those biocontrol agents alone.

**A social raptor exploits the absconding response of Neotropical social wasps in order to prey on their nests**

S. McCann, O. Moeri, T. Jones, C. Scott, G. Khaskin, R. Gries, S. O’Donnell and G. Gries, *Department of Biological Sciences, Simon Fraser University, Burnaby, B.C. and Department of Biodiversity, Earth and Environmental Science, Drexel University, Philadelphia, PA, USA.*

Red-throated Caracaras are falconid raptors that specialize in the brood of social wasps. We tested the hypothesis that they use repellents to fend off wasps by chemically analyzing the birds’ feather and feet and video-recording nest attacks. We conclude that caracaras use behavioural manipulation to subdue their prey.

***Anopheles gambiae* alters blood-feeding behavior in response to a host protected with the new repellent 3c(3,6)**

C. Hodson and B. Roitberg, *Department of Biological Sciences, Simon Fraser University, Burnaby, B.C.*

*Anopheles gambiae* is a vector of *Plasmodium* spp., which cause malaria. We evaluated bloodhost-seeking behaviour of *A. gambiae* when the host is protected by the

chemical 3c(3,6). We compared our results with DEET and found that 3c(3,6) may be an effective new chemical to repel *A. gambiae*.

**We can't be friends: Interspecific aggressive competitive behaviour of *Drosophila suzukii* and *Drosophila melanogaster* females when forced to share a common resource**

T. Dancau, T.L.M. Stemberger, B. Roitberg, *Department of Biological Sciences, Simon Fraser University, Burnaby, B.C.*

*Drosophila suzukii* differs from all other *Drosophila* by ovipositing in fresh rather than rotting fruits (Hauser 2011). When forced to utilize the same resources as *D. melanogaster*, *D. suzukii* performs poorly (Stemberger, pers comm). This study explores one aspect of competitive behaviours between these two species.

**Insect community dynamics in a high-Arctic ecosystem**

S. Robinson and G. Henry, *University of British Columbia, Vancouver, B.C.*

Climate change is expected to alter the dynamics of high-Arctic ecosystems. Plant communities have been studied in many high-Arctic ecosystems, but there are relatively few studies of insect communities, and even fewer on how these communities change throughout the short snow-free season. Having this information is important in the context of pollination services to flowering plants. During the summer of 2012, we conducted bowl trapping and hand-netting every two days, in order to survey the overall insect community as well as important floral visitors, at Alexandra Fiord, Ellesmere Island, Nunavut. The dominant floral visitors were primarily dipterans: *Syrphidae* of the genus *Eupeodes*, *Muscidae* of the genera *Phaonia* and *Drymeia*. Arctic bumblebees (*Bombus polaris*) were also found, but at nowhere near the frequency of the dipterans. Both families of dipterans were also found to visit during distinctly different times of the snow-free season. We present some of our preliminary findings on how this community changes throughout the season, and what changes in visitation may mean for a warming arctic.

**Pheromone-mediated defensive behaviour of *Dolichovespula maculata*.**

S. Ibarra, S. McCann, R. Gries, H. Zhai, and G. Gries, *Department of Biological Sciences, Simon Fraser University, Burnaby, B.C.*

We tested pheromone-mediated defensive behavior by *Dolichovespula maculata* hornets in response to venom-gland extracts from conspecifics. In venom-gland extracts of *D. maculata*, we identified seven components that, when tested as a synthetic blend, induced defensive behavior similar to venom-gland extracts.

**Patch-size and temperature-interaction effects on the predation of pea aphids (*Acrythosiphon pisum*) by the Asian Ladybird beetle, *Harmonia axyridis***

D. Quach, J. McKenzie and D. Gillespie, *Department of Biological Sciences, Simon Fraser University, Burnaby, B.C. and Agriculture & Agri-Food Canada, Agassiz, B.C.*

In order to study the combined effects of rearing temperature, foraging patch size, and foraging temperature on the predation rate of pea aphids by the Asian Ladybird beetle, a 2x2x2 factorial design experiment was done using rearing temperature, foraging temperature, and arena size as variables. Exposure temperature had the strongest effect on predation rate, whereas a strong interaction between exposure temperature and arena size was observed.

**Effects of poplar phenolics on the fitness and behaviour of *Chaitophorus* aphids**

A. Wong, P. Constabel and S. Perlman, *Department of Biology, University of Victoria, Victoria, B.C.*

Effects of phenolic secondary metabolites on phloem feeders was investigated using transgenic poplar with high tannins and low phenolic glycosides in bioassays with specialist *Chaitophorus* aphids. Aphids had higher fecundity on transgenic plants, but preferred wild-type tissue. Phenolic glycosides were identified in aphid extracts providing support for their presence in phloem and ingestion during aphid feeding.