

BETTER TOGETHER

CELEBRATING PARTNERSHIPS FROM
MICRO TO MACRO



Entomological Society of British Columbia
2025 Conference and AGM



UFV Land Acknowledgement

Long before Canada was formed, the Stó:lō (people of the river) occupied the land on which UFV is located. They lived in the Fraser Valley and lower Fraser Canyon of British Columbia and they spoke Halq'eméylem, also known as the upriver dialect. We recognize and honour the contributions that Aboriginal people have made, and continue to make, to our community.

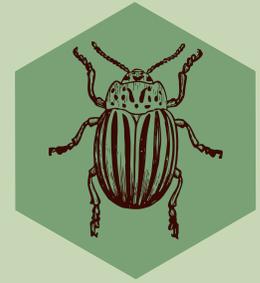
Meeting Location (UFV)

33844 King Rd Room S1109,
Abbotsford, BC V2S 7M8





ESBC Conference 2025: BETTER TOGETHER



Friday, November 21st

9:00 AM - Welcome & Opening Remarks - Dr. Michelle Franklin, ESBC President

Plenary 1 (9:10 AM - 9:40 AM)

Moderator: Michelle Franklin

Filling in (some of) British Columbia's biodiversity data gaps

Dr. Dezene Huber, Professor, Faculty of Environment, University of Northern British Columbia

Abstract: British Columbia contains many dozens of habitats ranging from its coasts to its mountains, its mainland to its islands, its rainforests to its deserts, and its north to its south. Those habitats are each amazingly diverse, teeming with arthropod life. It is important to know what organisms are living around us to be able to conserve them for their intrinsic value and for the ecosystem services that they provide. But despite decades of research, we are only barely scratching the surface of insect biodiversity in the province. Thankfully new (and new-ish) tools such as DNA barcoding and digitized databases can help to accelerate that work. I will discuss recent work by UNBC graduate students with a large Odonata dataset, as well as other examples from our research program, to demonstrate some possibilities and to encourage further work in some of BC's less-surveyed ecosystems.



BIO: Dezene Huber is a professor in the Faculty of Environment at the University of Northern British Columbia. He and his students and collaborators spend time in a variety of habitats and contexts to understand insect ecology in BC's central interior and beyond.

ESBC Special Projects Presentations

(9:40 AM - 10:16 AM)

Moderator: Michelle Franklin

1. Dytiscus Larvae of Metro Vancouver

Quinlan Wu, University of British Columbia

2. Wasps Rule - A Journey Into The Paper Nest

Karen Ashby, ESBC

3. Making Insect Identification Accessible - Educational materials of the Native Bee Society of BC.

Bonnie Zand (On Behalf of Jade Lee), Native Bee Society of BC special project



Student Presentations - Ph.D.



(10:16 AM - 11:05 AM)

Moderator: Michelle Franklin

1. Environmental filtering structures web building spider communities along an elevational gradient

Andrea Haberkern, University of British Columbia

2. It's raining bugs! Arthropod rain in a tropical forest

Andrew Seiler, University of Louisville

3. Stable flies preferentially oviposit on sites offering conspecific eggs with egg-derived bacterial semiochemicals

Emmanuel Hung, Simon Fraser University

4. Old specimens, new platforms: uniting museums and iNaturalist for better insect diversity data in BC

Nathan Earley, University of Victoria

MORNING BREAK & SNACKS: 11:05 AM - 11:25 AM

Student Presentations - Masters

(11:25 AM - 1:05 PM)

Moderator: Michelle Tseng

1. Untangling drivers of bumblebee activity in spatially-patterned Arctic tundra landscapes

Alexandre Beauchemin, University of British Columbia

2. Are You My Mummy? Investigating Aphid Parasitism Trends in Lower Mainland Highbush Blueberries

Eva Burghardt, University of British Columbia; Agriculture and Agri-Food Canada

3. “Wormplex: Development of novel qPCR multiplex assays for species-specific identification for in-field monitoring of major click beetle (Coleoptera: Elateridae) pests in British Columbia”

Kathleen Furtado, University of British Columbia

4. Beetles and Biodiversity: Exploring Carabidae Communities Across Vineyard and Semi-Natural Habitats

Hannah Friesen, Agriculture and Agri-Food Canada; University of British Columbia-Okanagan

5. Evaluating Blueberry Host Plant Resistance to Aphids via In Situ Monitoring and Ex-Situ Preference Assays

James Pickett, Simon Fraser University; Agriculture and Agri-Food Canada

6. Geo-climatic conditions impact St. John’s wort (*Hypericum perforatum* L.) phenology, abundance and chemistry under biological control

Andres Mancera Barreto, University of British Columbia-Okanagan; Agriculture and Agri-Food Canada

7. Modelling elevational trends in *D. suzukii* infestation of Indigenous crops

Nicholas Hivon, Agriculture and Agri-Food Canada

8. Habitat fragmentation and parasitism of leafroller caterpillars on blueberry farms

Paul Fisher, University of British Columbia





LUNCH BREAK: 1:05 PM - 2:05 PM

Plenary 2 (2:05 PM - 2:35 PM)

Moderator: Juli Carrillo

Long-term monitoring on a shoestring: Leveraging the power of undergraduates and research partnerships for science

Dr. Sandra Gillespie, Associate Professor, Faculty of Biology, University of the Fraser Valley

Maintaining a high quality, consistent and relevant research program is challenging, even more so when you work at an institution that is teaching focused, and lacks the support of start up funding, and graduate students. However, this presents an opportunity to pursue projects that aren't tied to the need to quickly publish and acquire grants, and to build a program that engages undergraduates in meaningful research experiences. To this end I've created a long-term monitoring project that is designed to be low cost and feasible with students that may only be able to work part time for a single summer. My students and I have monitored bumblebee populations across seven locations since 2018, documenting community composition and prevalence of two common bumblebee pathogens. This data provides unique insights into how bumblebee communities and their pathogens have changed over time and has created opportunities for further partnerships and research. Long term data is not easily generated by publication focused research – making this a valuable contribution to research, that also has given 16 students an opportunity to fully engage with entomological research. This illustrates the value of building partnerships and research programs that don't align with the traditional model of academic research.



BIO: Dr. Gillespie is currently an Associate Professor in the Biology department at U.F.V. Her research focuses on pollination ecology, with an eye to understanding both basic and applied aspects of pollination. She works specifically on bumblebees and their pathogens, interactions between invasive species and pollinators, and issues in crop pollination.



Student Presentations - Undergraduate 10-minute

(2:35 PM - 4:15 PM)

Moderator: Juli Carrillo

- 1. Collective effects of stimulus intensity, background contrast, and ambient light on sexually-dimorphic attraction of stable flies**
Ahmed Sabih, Simon Fraser University

- 2. Trust your gut: Bacteria identified in stable fly feces inform foraging decisions of conspecific flies.**
Augustus Negraeff, Simon Fraser University

- 3. Management of blackheaded fireworm populations using a baculovirus based pesticide**
Daniel Lee, University of British Columbia

- 4. The mysterious life history of mealybugs in the South Okanagan**
Jay Nelson, University of British Columbia-Okanagan; Agriculture and Agri-Food Canada; University of British Columbia

- 5. Showy milkweed (*Asclepias speciosa*) distribution and insect community composition at the northern range of the western monarch butterfly (*Danaus plexippus*)**
Julie Sieg, University of British Columbia

- 6. Sizzle or Settle? Realistic high temperatures could cause an egg parasitoid to abandon its hosts**
Madison Khashan, Agriculture and Agri-Food Canada

- 7. Leafhopper Phenology: Insights for Pest Management**
Michelle Ma, University of British Columbia; Agriculture and Agri-Food Canada



Student Presentations - Undergraduate 10-minute Cont.

8. Who is who: Identification and interactions of *Larinus minutus* and *Bangasternus fausti* within diffuse knapweed

Rachel Wong, Simon Fraser University; Agriculture and Agri-Food Canada

AFTERNOON BREAK: 4:15 PM - 4:35 PM

Student Presentations - Undergraduate 5-minute

(4:35 PM - 5:15 PM)

Moderator: Sandra Gillespie

1. Testing the accuracy of morphologically-based identification methods for discerning among two species of weed biocontrol agents

Ian Polard, University of British Columbia-Okanagan; Agriculture and Agri-Food Canada

2. Phenology of Hemlock Woolly Adelgids (*Adelges tsugae*) in the Lower Mainland

Joanna Tate, University of the Fraser Valley

3. Webs and Wines: Spider diversity and non-native range expansion in Okanagan vineyards

Bennett Klinger, University of British Columbia-Okanagan

4. Developing a fungal tree band for management of the invasive spotted lanternfly (*Lycorma delicatula*)

Ryan Lam, Agriculture and Agri-Food Canada; Simon Fraser University

5. Histological Comparison of Eastern and Western Hemlocks and the impact on Adelgid Infestation

Shayla Dao, University of the Fraser Valley



Post-Symposium Mixer



Join us after the first day of presentations for an evening of entomological trivia and pizza!

WHERE: Mixer will take place in the same venue, no need to relocate.

WHEN: Friday, November 21st, 5:30 PM - 7:30 PM

- Pizza will be provided for all attendees, and beverages (alcoholic and non-alcoholic) will be available for purchase in the venue.
- We encourage attendees participating in the trivia to form teams of **no more than 6**, and to incorporate a wide range of experience levels.



ESBC Conference 2025: BETTER TOGETHER: DAY 2

Saturday, November 22nd



9:00 AM - Preserving the history of the ESBC - Yonathan Uriel, ESBC Treasurer

Professional Presentations

(9:10 AM - 11:15 AM)

Moderator: Kathleen Furtado

- 1. Introduction to the Grape and Tree Fruit Entomology Program at the Summerland Research and Development Center. (5 min talk)**
Asim Renyard, Agriculture and Agri-Food Canada

- 2. The BC Bee Atlas – leveraging the power of volunteers to inventory native bee biodiversity**
Bonnie Zand, Native Bee Society of British Columbia

- 3. Using historical data to predict the introduction and growth of spongy moth populations in Western Canada**
Brian Van Hezewijk, Canadian Forest Service

- 4. Floral alleys may support pollinators and parasitoid wasps in blueberry crops**
Carly McGregor, University of British Columbia

- 5. Update on federal research to proactively reduce the risk spotted lanternfly poses to Canada**
Chandra Moffat, Agriculture and Agri-Food Canada



Professional Presentations Cont.

6. Habitat Amendments in Agriculture Support Diverse and Abundant Beneficial Insect Communities

Juli Carrillo, University of British Columbia

7. A non-native parasitoid facilitates a resident parasitoid's development in an invasive pest

Paul Abram, Agriculture and Agri-Food Canada

8. Responses of ground beetles (Coleoptera: Carabidae) to ground-based light traps in southwestern British Columbia

Rob McGregor, Douglas College

9. Investigating potential cryptic speciation of blueberry gall midge (*Dasineura oxycoccana*) from cultivated highbush blueberries (*Vaccinium corymbosum*) in the Pacific Northwest

Tamryn Kennedy, Kwantlen Polytechnic University

10. Soft Scale Killers: Natural Enemies of Cottony Vine Scale

Andrea Brauner, Agriculture and Agri-Food Canada

SYMPOSIUM END & MORNING BREAK: 11:15 AM - 11:35 AM

ANNUAL GENERAL MEETING: 11:35 AM - 12:35 PM

END: 12:40 PM





STUDENT ORAL PRESENTATION AWARDS

The Entomological Society of British Columbia presents awards for the best student (BSc, MSc, or PhD) oral presentations. For consideration, students must be registered at a post-secondary institution and give a presentation at the Annual General Meeting (AGM). Prizes are awarded at the AGM. The MSc presentation award is known as the James Grant Award. This award is sponsored by the [North Okanagan Naturalist Club](#) and memorializes their founder and first president.

GRADUATE STUDENT SCHOLARSHIP COMPETITION

The Entomological Society of British Columbia awards annually a scholarship of \$1000 to up to two postgraduate students to encourage students engaged in entomological research in BC. For more information on eligibility and how to apply, visit entsocbc.ca/awards-scholarships.

DEXTER JOHNSON AWARD IN INSECT SCIENCE

This is a \$1000 annual award recognizes the best manuscript submitted in any peer-reviewed journal by a student in the field of insect ecology. The award is open to all students (membership in the ESBC is not necessary).

EQUITY, DIVERSITY & INCLUSION AWARD

The Entomological Society of British Columbia annually awards a scholarship of \$1000 to support the participation of one graduate student from a group currently underrepresented within the ESBC. Funds may be used at the student's discretion.





BETTER TOGETHER: CELEBRATING PARTNERSHIPS FROM MICRO TO MACRO



List of presenters, coauthors, and abstracts

PLENARY SPEAKERS

Dr. Dezene Huber, Professor, Faculty of Environment, University of Northern British Columbia

Title: Filling in (some of) British Columbia's biodiversity data gaps

Abstract: British Columbia contains many dozens of habitats ranging from its coasts to its mountains, its mainland to its islands, its rainforests to its deserts, and its north to its south. Those habitats are each amazingly diverse, teeming with arthropod life. It is important to know what organisms are living around us to be able to conserve them for their intrinsic value and for the ecosystem services that they provide. But despite decades of research, we are only barely scratching the surface of insect biodiversity in the province. Thankfully new (and new-ish) tools such as DNA barcoding and digitized databases can help to accelerate that work. I will discuss recent work by UNBC graduate students with a large Odonata dataset, as well as other examples from our research program, to demonstrate some possibilities and to encourage further work in some of BC's less-surveyed ecosystems.

Dr. Sandra Gillespie, Associate Professor, Faculty of Biology, University of Northern British Columbia

Title: Long-term monitoring on a shoestring: Leveraging the power of undergraduates and research partnerships for science

Abstract: Maintaining a high quality, consistent and relevant research program is challenging, even more so when you work at an institution that is teaching focused, and lacks the support of start up funding, and graduate students. However, this presents an opportunity to pursue projects that aren't tied to the need to quickly publish and acquire grants, and to build a program that engages undergraduates in meaningful research experiences. To this end I've created a long-term monitoring project that is designed to be low cost and feasible with students that may only be able to work part time for a single summer. My students and I have monitored bumblebee populations across seven locations since 2018, documenting community composition and prevalence of two common bumblebee pathogens. This data provides unique insights into how bumblebee communities and their pathogens have changed over time and has created opportunities for further partnerships and research. Long term data is not easily generated by publication focused research – making this a valuable contribution to research, that also has given 16 students an opportunity to fully engage with entomological research. This illustrates the value of building partnerships and research programs that don't align with the traditional model of academic research.

List of presenters, coauthors, and abstracts, cont.

ESBC SPECIAL PROJECTS

Quinlan Wu, University of British Columbia

Title: Dytiscus Larvae of Metro Vancouver

Abstract: In British Columbia there are 8 recorded species of predaceous diving beetles (Dytiscidae) in the genus *Dytiscus*—*D. alaskanus*, *D. circumcinctus*, *D. cordieri*, *D. dauricus*, *D. fasciventris*, *D. harrisii*, *D. hatchi*, and *D. marginicollis*. Of these species, six have been recorded within the Metro Vancouver Regional District (MVRD)—*D. dauricus*, *D. circumcinctus* (both of which are only known in the MVRD from single specimens in the Spencer Entomological Collection), *D. cordieri*, *D. harrisii*, *D. hatchi*, and *D. marginicollis*. While the larval morphology of *D. cordieri* and *D. dauricus* have been only briefly described, the other four species recorded in MVRD lack larval descriptions altogether. Through this project under the ESBC's Special Projects Grant, breeding populations of four of these species were located within Metro Vancouver. From these populations, larvae were successfully collected and reared to adulthood to confirm their species, during which their morphology was described and their behaviour was observed both in-situ and in a laboratory setting. Through these descriptions, a dichotomous key was created for identification of the larvae of these four species.

Karen Ashby, ESBC

Title: Wasps Rule - A Journey Into The Paper Nest

Abstract: Entomology is often treated as something that only happens in universities, yet some of the strongest voices shaping how British Columbians feel about insects come from outside academia. This talk shares the story of The Paper Nest, the pesticide-free wasp removal and education service I founded after working as an exterminator. My early fascination with wasps collided with the reality of routinely destroying beneficial insects, and I grew increasingly troubled by the heavy reliance on broad-spectrum pesticides—so I chose a different path. Now, every wasp call begins with education. Before any removal, I walk clients through wasp behaviour, their ecological importance, and the many situations where a nest can safely stay. If they choose to leave it, the visit is completely free. When removal is truly necessary, it's done without pesticides, and the nest is transformed into my art and teaching tools—nothing wasted, everything honoured. Through collaborations with the Honeybee Centre, I share live nests, hands-on workshops, and reimagined narratives about “scary” insects with children and families. I've seen firsthand how curiosity spreads when fear dissolves. Community-rooted outreach can spark that shift—turning hesitation into appreciation and helping build a culture of insect conservation in BC. Wasps rule.

Jade Lee (Presented by Bonnie Zand),

Title: Making Insect Identification Accessible - Educational materials of the Native Bee Society of BC.

Abstract: The Native Bee Society of BC (NBSBC) is a non-profit organization dedicated to education and conservation for BC's more than 500 native bee species. Public education occurs through tabling events, public speaking, bee walks and talks, workshops and courses. With growing public interest in observing and identifying native bees in gardens and conservation areas, the NBSBC is producing free, high-quality resources to enhance understanding and identification of native bees. These include visual profiles of common bee genera with nesting, foraging and identification information. The NBSBC already has 12 profiles available for download, and the current ESBC special projects grant will allow the creation of three more.

List of presenters, coauthors, and abstracts, cont.

PHD PRESENTATIONS

Andrea M. Haberkern (UBC, Zoology), Jessica C. Boles (University of Belize, Environmental Research Institute) Antônio D. Brescovit (Zoological Collections, Instituto Butantan), Leticia Avilés (UBC, Zoology)

Title: Environmental filtering structures web building spider communities along an elevational gradient

Abstract: Elevational gradients provide powerful natural experiments for understanding how abiotic and biotic factors shape community structure. We examined how the composition of web-building spiders changes from lowland rainforest to páramo along an Andean elevational gradient in Ecuador. Using transect-level surveys combined with climate data, we found that rainfall intensity, predation rate, canopy cover, and leaf size all decline sharply with elevation. Structural equation models revealed that rainfall intensity was the dominant environmental driver of web-type composition, mediating the indirect effect of elevation on spider communities. In wetter lowland forests, frequent and intense rainfall suppressed the abundance of spiders with costly three-dimensional webs, favoring simpler tangle architectures. At higher, drier sites, sheet-and-tangle webs increased dramatically—becoming the predominant web form in the páramo—while orb webs remained largely consistent across elevations. Overall spider density did not vary significantly along the gradient, but web architecture shifted predictably in response to environmental filtering by rainfall. These findings demonstrate that environmental filtering, particularly through rainfall intensity, structures tropical spider communities along mountain gradients and highlight how differential selection on web architecture can mediate community responses to climatic variation.

Andrew R. Seiler (University of Louisville), Alyssa Y. Stark (Villanova University), Stephen P. Yanoviak (University of Louisville)

Title: It's raining bugs! Arthropod rain in a tropical forest

Abstract: In tropical forests, “arthropod rain” (i.e, the steady fall of insects and other invertebrates from the canopy) represents a potentially important terrestrial nutrient flux. I quantified this vertical flux on Barro Colorado Island, Panama, using paired pan traps (collecting fallen arthropods) and pole traps (sampling those climbing upward). The canopy delivers nearly ca. 27 kg per sq. km per month of arthropod biomass into the understory. Hymenoptera, especially ants, and Lepidoptera larvae dominated this flux. High wind events increased arthropod abundance in pan traps, but no relationship with rain was observed. Overlap between pan and pole trap contents suggests that some fallen arboreal arthropods regularly return to the canopy. Together these results reveal an overlooked linkage between canopy and litter food webs, highlighting arthropod rain as a small but steady connector within tropical forest nutrient cycles.

List of presenters, coauthors, and abstracts, cont.

Emmanuel Hung (SFU), Anya Gould (SFU), Stephanie Zaborniak (SFU), Caelen Watson (SFU), Regine Gries (SFU), Sukhmani Kaur (SFU), Kyra Stephens (SFU), Augustus Negraeff (SFU), Aryan Monfared (SFU), Ryan Lam (SFU), Tea Zamani (SFU), Gerhard Gries (SFU)

Title: Stable flies preferentially oviposit on sites offering conspecific eggs with egg-derived bacterial semiochemicals

Abstract: Selection of oviposition sites by gravid flies is often guided by the presence of cues from conspecifics. Working with blood-feeding stable flies, *Stomoxys calcitrans* (Diptera: Muscidae), we tested the hypotheses that (i) stable flies preferentially oviposit on sites offering conspecific eggs with egg-derived airborne semiochemicals, (ii) egg-borne bacteria elicit oviposition, and (iii) egg- or egg bacteria-derived semiochemicals attract flies. Two-choice laboratory experiments revealed that flies were attracted to, and preferentially oviposited on, sites with conspecific eggs. Both attraction of flies and oviposition were mediated by semiochemical gases and volatiles emitted from bacteria on stable fly eggs. Of the identified bacterial symbionts, *Serratia marcescens* and *Sporosarcina* sp. were most attractive to gravid females. Analysis of headspace volatile extracts of *S. marcescens* by gas chromatography-mass spectrometry revealed 13 volatile organic compounds, and gas meters measured elevated levels of two gases: carbon dioxide (CO₂) and ammonia (NH₃). CO₂ and NH₃, in binary combination, attracted flies and prompted oviposition. Altogether, our data suggest that stable flies engage in conspecific cueing to select suitable sites for oviposition and development of larval offspring. Improving our understanding of the factors influencing stable fly oviposition site selection may aid in the development of more effective fly management tactics.

Nathan G. Earley (UVIC), Joel F. Gibson (RBCM), John D. Reynolds (SFU), Brian M. Starzomski (UVIC)

Title: Old specimens, new platforms: uniting museums and iNaturalist for better insect diversity data in BC

Abstract: As biodiversity research increasingly relies on large-scale species-occurrence data, understanding the relative strengths and limitations of these datasets is crucial for their effective mobilization and integration. The ongoing digitization of natural history collections (NHCs) and the rise of community (i.e. citizen) science have greatly increased the volume, accessibility, and geographic coverage of species-occurrence data. Despite broad consensus in the literature about the complementarity of these datasets, questions about the quality and usefulness of community science data persist. In this study, we used gall-forming Cynipoidea (Hymenoptera) in BC as a case study to compare species-occurrence data from the community science platform iNaturalist with data from the province's three main entomological collections. Our comparison focused on the number of records, species richness, and geographic coverage captured in each dataset. We found that iNaturalist had more records, more species, and broader geographic coverage than NHCs, while NHCs contributed additional species and important historical context. Our results highlight the value of community science datasets for understanding species diversity and distribution, while underscoring the critical role of NHCs for producing quality data. Furthermore, our findings emphasize the enhanced value of community science when taxonomic experts are actively involved in curating community science data for underrepresented taxa.

List of presenters, coauthors, and abstracts, cont.

MASTERS PRESENTATIONS

Alexandre Beauchemin (Department of Forest and Conservation Sciences, The University of British Columbia), Isla Myers-Smith (Department of Forest and Conservation Sciences, The University of British Columbia), Cameron Eckert (Yukon Parks, Yukon Government)

Title: Untangling drivers of bumblebee activity in spatially-patterned Arctic tundra landscapes

Abstract: Climate change is altering the timing of flowering and pollinator activity in Arctic tundra, yet these shifts might not occur in synchrony. We analyzed environmental drivers of bumblebee activity across the 2024 and 2025 growing seasons and tested the occurrence of phenological mismatch using passive monitoring methods, analyzing 8000 hours of soundscape recordings to detect bumblebee (*Uummarmiutun*: Igutchaq) flight buzzes and 1000 cumulative days of time-lapse photography of flowering across ten sites on Qikiqtaruk–Herschel Island, Yukon.

Our preliminary results support a marginal mismatch along a microclimatic gradient, with bumblebee activity increasingly lagging behind flowering. Across sites, microclimate differences comparable to a decade of regional warming (~1.6°C) were linked to a four-day delay of peak bumblebee activity relative to flowering. Local weather and seasonal patterns better explained daily bumblebee activity than floral rewards. Our results suggest that the window for bumblebee activity is not expanding as rapidly as the growing season under climate change.

Together, these findings suggest that a decoupling of plant and pollinator phenology could be driven by greater sensitivity of plants compared with bumblebees to a climate gradient. As Arctic regions continue to experience warming faster than the global average, this mismatch could increasingly disrupt tundra ecosystems.

Eva Burghart (University of British Columbia), Michelle Franklin (Agriculture and Agri-Food Canada), Bryan Brunet (Agriculture and Agri-Food Canada), Juli Carrillo (University of British Columbia)

Title: Are You My Mummy? Investigating Aphid Parasitism Trends in Lower Mainland Highbush Blueberries

Abstract: In the last two decades, highbush blueberry production in the lower mainland of British Columbia has seen many developments; with a new profile of pesticides being applied in response to increased presence of invasives, investigation is needed on the changing biodiversity and abundance of parasitoids in agroecosystems. In order to ascertain information on the communities of aphid-parasitoids in highbush blueberry fields, we collected blueberry plant tips infested with live aphids and aphid mummies from five sites over the course of the 2024 and 2025 growing season. Sample sites included two organic fields, two conventional fields, and one conventional field with no-spray rows. Blueberry tips were kept for a month in a controlled laboratory setting in order to rear parasitoids, which were collected and will be identified to species level. Current analysis focuses on temporal emergence trends and differences between organic and conventionally managed fields, as well comparing current genera present in blueberry fields to populations sampled twenty years ago in a similar study. Data analysis and species identification is ongoing, but biodiversity trends and differences are addressed at the genus level.

List of presenters, coauthors, and abstracts, cont.

Kathleen Furtado (University of British Columbia), Carol Ritland (The University of British Columbia), Michelle Franklin (Agriculture and Agri-Food Canada), Wim van Herk (Agriculture and Agri-Food Canada), Richard Hamelin (The University of British Columbia)

Title: “Wormplex: Development of novel qPCR multiplex assays for species-specific identification for in-field monitoring of major click beetle (Coleoptera: Elateridae) pests in British Columbia”

Abstract: Wireworms, the larval stage of click beetles (Coleoptera: Elateridae), are pests of staple agricultural crops. Accurately distinguishing between pest and non-pest species is challenging, lengthy, and requires expertise. This can result in overuse of pesticides, as a crop “insurance”, regardless of the presence and/or low levels of pest species. Our study aimed to design Wormplex, novel real-time PCR multiplex assays using species-specific primers and probes. Three multiplex assays (*Agriotes lineatus* and *A. obscurus* in a single reaction), Wormplex-Limonius-1 (*Limonius canus* and *L. infuscatus* in a single reaction), and Wormplex-Limonius-2 (*L. californicus* and *L. infuscatus* in a single reaction) were tested on 186-204 samples and yielded 100% accuracy, specificity, sensitivity and precision for detection of target species. Wormplex has the potential to be deployed in the field with field-ready DNA extraction methods and use of a portable qPCR instrument. Using Wormplex for reliable and accurate identification of these pests in the field can provide substantial economic and environmental benefits.

Hannah Friesen (AAFC/ UBC-O), Dr. Kirsten Hannam (AAFC), Dr. Dave Ensing (AAFC), Bennett Klinger (UBC-O), Dr. Jason Pither (UBC-O), Dr. Lael Parrott (UBC-O)

Title: Beetles and Biodiversity: Exploring Carabidae Communities Across Vineyard and Semi-Natural Habitats

Abstract: The expansion of viticulture across the Okanagan Valley (BC) presents both challenges and opportunities for biodiversity conservation and sustainable pest management. While the intensification of winegrape production can reduce habitat, these perennial agroecosystems also have potential to support beneficial arthropods by managing vegetation in inter-rows and retaining semi-natural vegetation in the surrounding landscape. This study represents the first region-wide assessment of how vineyard vegetation management and surrounding landscapes influence biodiversity in this region. Focusing on carabid beetles (Carabidae) as biodiversity indicators, I examine how communities differ between vineyard habitats and adjacent semi-natural areas across 31 sites spanning Osoyoos to Lake Country. Over two years (2024–2025), pitfall traps were deployed in vine rows, inter-rows, and nearby semi-natural habitats during early (June) and late (September) growing seasons to evaluate patterns in species composition and functional traits using multivariate community analyses. Preliminary results indicate that overall carabid abundance was higher in vineyards, but this was driven largely by introduced species, whereas semi-natural habitats supported a higher proportion of native and low-dispersal taxa. These contrasting species assemblages suggest that vineyards can provide habitat for carabid beetles, but semi-natural habitats remain important for conserving rare taxa and maintaining functional diversity in viticultural landscapes.

List of presenters, coauthors, and abstracts, cont.

James Pickett (Simon Fraser University, Agriculture and Agri-Food Canada), Michelle Franklin (Agriculture and Agri-Food Canada), Yonathan Uriel (Agriculture and Agri-Food Canada), Jacob McPherson (University of British Columbia)

Title: Evaluating Blueberry Host Plant Resistance to Aphids via In Situ Monitoring and Ex-Situ Preference Assays

Abstract: Blueberry Scorch Virus (BIScV) is a significant threat to British Columbia's highbush blueberry production. Current Integrated Pest Management (IPM) strategies have not explored host plant resistance to BIScV's primary aphid vector, as a potential alternative for the sustainable management and prevention of virus transmission. Over three years we evaluated unique blueberry varieties from the BC Blueberry Breeding Program for aphid density in-situ to screen for aphid resistant cultivars. Six low aphid density cultivars were tested for *E. fimbriata* resistance via non-preference and host plant suitability assays, from which several cultivars showed significant levels of resistance. Future work includes expanding the tests to other aphid species and determining mechanisms of resistance. These results will be used to inform the breeding program with the goal of improving aphid management to combat the spread of BIScV.

Andres M. Mancera Barreto (UBC-O, Agriculture and Agri-Food Canada), Christine Cock (Agriculture and Agri-Food Canada), Caley B. Craven (Agriculture and Agri-Food Canada), David J. Ensing (Agriculture and Agri-Food Canada), Jason Pither (UBC-O), Chandra E. Moffat (Agriculture and Agri-Food Canada)

Title: Geo-climatic conditions impact St. John's wort (*Hypericum perforatum* L.) phenology, abundance and chemistry under biological control

Abstract: St. John's wort (*Hypericum perforatum* L.) has been a problematic invader of British Columbia's grasslands for centuries. Seventy years ago, the introduction of specialized herbivorous insects effectively reduced the plant's impact province-wide, initiating biocontrol of invasive plants in Canada. Now, under changing climates, the long-term biocontrol effectiveness of *H. perforatum* is less certain, as reports indicate possible plant expansion into high elevations and persistent infestations. To investigate factors possibly driving variation in the effectiveness of Canada's oldest weed biocontrol program, we quantified the phenology, height, coverage/abundance and secondary metabolites of *H. perforatum* from April to December 2024 at 17 sites within BC's Southern Interior. We explored trait associations with growing season length, geography, biocontrol abundance, and herbivory. We found that (i) shorter growing season length correlates with faster plant phenology; (ii) biocontrol abundance negatively correlates with toxicity and time to sexual reproduction; (iii) increased herbivory correlates with accelerated stem death, and (iv) moderate levels of herbivory are associated with reductions in plant abundance. For biological control to be more effective, our findings suggest that insects would need to adapt to earlier plant phenologies observed at higher elevations while compensating for faster toxin accumulation in plant material encountered in later phenological stages.

List of presenters, coauthors, and abstracts, cont.

Nicholas Hivon (Agriculture and Agri-Food Canada), Robert Lalonde (University of British Columbia), Jason Pither (University of British Columbia), Chandra Moffat (Agriculture and Agri-Food Canada, University of British Columbia); Westbank First Nation and Ntityix Resources LP

Title: Modelling elevational trends in *D. suzukii* infestation of Indigenous crops

Abstract: *Drosophila suzukii* (spotted wing drosophila) is an agricultural pest that oviposits in the flesh of ripe, high-quality fruit. In commercial agriculture, spotted wing is managed with insecticides. Outside of the commercial agriculture setting spotted wing populations infest native ecosystems and can move from a native non-crop environment back to commercial crops. Infestation relies on a phenological match between host plant ripeness and mated female fly activity. Identifying phenological mismatches can inform management action for native plants. In the Okanagan Valley spotted wing infests many native fruits, including *Vaccinium membranaceum* (black huckleberry). This is a culturally important plant to the Syilx People of the Okanagan Nation and Indigenous People throughout western North America, providing communities with food sovereignty and an opportunity for generational knowledge transfer. We monitored spotted wing within huckleberry patches along an elevation gradient in the Okanagan Valley and have observed a phenological mismatch. We hypothesize that there exists an elevational refugia where huckleberry is subject to reduced pest pressure by spotted wing. We are modelling the infestation rate of huckleberry by spotted wing using fine-grain environmental data and field-collected data to further understand the effect of elevation on the infestation dynamics between these two organisms.

Paul Fisher (University of British Columbia), Dr. Juli Carrillo, Dr. Paul Abram

Title: Habitat fragmentation and parasitism of leafroller caterpillars on blueberry farms

Abstract: The simplification of agricultural landscapes is a key driver of the loss of insect biodiversity. This can lead to decreased ecosystem stability and less effective delivery of services that insects provide, such as pest control. Parasitoid wasps are small wasps that lay eggs in or on other insects, killing them as the larvae develop, and are among these important ecosystem service providers. Parasitoid diversity and parasitism rates on farms generally respond positively to the amount of natural and seminatural habitat in the surrounding landscape, but we do not know how the configuration – or fragmentation – of patches of natural habitat affects them. This research aims to disentangle the effects of fragmentation from habitat amount by measuring parasitoid diversity and parasitism rates in Tortricid caterpillars on blueberry farms across a range of fragmentation levels in the surrounding landscape. I collected Leafrollers weekly at 16 blueberry farms from mid-May to mid-June and reared them in the lab until either moths or parasitoids emerged. I then identified the parasitoids to morphospecies using available keys and added them to a reference collection. Data analysis is ongoing, and I will repeat the collections at more farms next summer.

List of presenters, coauthors, and abstracts, cont.

UNDERGRADUATE PRESENTATIONS - LONG-FORM

Ahmed Sabih (Simon Fraser University), Hamody Sabih (Simon Fraser University)

Title: Collective effects of stimulus intensity, background contrast, and ambient light on sexually dimorphic attraction of stable flies

Abstract: Stable flies, *Stomoxys calcitrans*, are attracted to traps with specific visual characteristics. However, the mechanisms underlying fly attraction to these traps, such as trap-background contrast, are poorly understood. In two-choice arena bioassays with innovative experimental design, I investigated the effects of (i) relative intensity of paired visual stimuli, (ii) their contrast against background, and (iii) ambient light level on attraction of female and male stable flies to these stimuli. Under both relatively high and low ambient light levels (80–89% and 2–4%, respectively), female and male flies landed first more often on the low-intensity stimulus than on the high-intensity stimulus. However, altering the contrast between the paired stimuli and their background, and/or the ambient light level, shifted the flies' preferential orientation toward and landing on test stimuli, inducing sex-specific behavioural responses. Low-intensity visual stimuli under both low and high ambient light were attractive to both sexes as long as the paired high-intensity visual stimulus did not strongly contrast against background (small Weber fraction). High-intensity visual stimuli with a high contrast against the background (large Weber fraction) attract male but not female flies. This behaviour may be linked to the mate-location strategy of males awaiting females on high-intensity perches.

Augustus Negraeff (Simon Fraser University [SFU]), Emmanuel Hung (SFU), Caelen Watson (SFU), Regine Gries (SFU), Aryan Monfared (SFU), Gerhard Gries (SFU).

Title: Trust your gut: Bacteria identified in stable fly feces inform foraging decisions of conspecific flies.

Abstract: Blood-feeding stable flies, *Stomoxys calcitrans*, are reportedly attracted to conspecific feces. We tested the hypotheses that (1) stable flies are attracted to semiochemicals of feces-derived bacteria, (2) attraction to bacterial semiochemicals varies with composition of bacterial strains and growth substrate, and (3) attraction to bacterial semiochemicals varies with fly sex and physiological status. We isolated and identified seven bacterial strains in stable fly feces. Two-choice bioassays with paired traps baited with sterile agar or agar inoculated with one or more isolates revealed that two isolates, *Serratia marcescens* and *S. surfactantfaciens*, attracted flies. Analyses of fly-attracting isolates' headspace volatiles by gas chromatography-mass spectrometry revealed near-identical odor profiles, explaining their comparable attractiveness to flies. Bacterial attractiveness to foraging flies was dependent upon growth medium. Attraction to bacterial semiochemicals was also contingent upon elevated CO₂ levels activating foraging behaviours. Our interpretation that semiochemicals of feces-dwelling bacteria function in the context of foraging was further supported by data showing that *S. marcescens* attracted flies regardless of sex or physiological status.

List of presenters, coauthors, and abstracts, cont.

Daniel Lee (University of British Columbia), Jennelle Breen (Simon Fraser University; Agriculture and Agri-Food Canada), David Theilmann (Agriculture and Agri-Food Canada), Yonathan Uriel (Agriculture and Agri-Food Canada), Michelle Franklin (Agriculture and Agri-Food Canada).

Title: Management of blackheaded fireworm populations using a baculovirus based pesticide

Abstract: We created a biopesticide formulant for management of blackheaded fireworm using a baculovirus identified by David Theilmann and Sheila Fitzpatrick in 1995. In 2024 and 2025 we tested this formulant on plots in the BC cranberry research farm. For both years we observed that the populations of fireworm decreased when sprayed with the product compared to our control. We also saw less cranberry fruit being consumed by fireworm after application, suggesting that this product could be effective in managing fireworm populations and increasing harvest yield.

Jay Nelson (University of British Columbia-Okanagan; Agriculture and Agri-Food Canada; University of British Columbia), Asim Renyard (Agriculture and Agri-Food Canada, Andrea Brauner (Agriculture and Agri-Food Canada), Tyler Nelson (Agriculture and Agri-Food Canada)

Title: The mysterious life history of mealybugs in the South Okanagan

Abstract: Mealybugs (Hemiptera: Pseudococcidae spp.) are cryptic phloem-feeding pests that reside underneath the bark on grapevines. Mealybug vector plant pathogens, including sooty mold and leaf-roll viruses, causing significant yield losses and altering flavour compounds in wine grapes. To provide more efficient and effective pest control options greater knowledge of mealybug phenology would aid vineyard managers. Recent observations indicate that multiple species of mealybugs may be present in Okanagan vineyards This study aims to better understand MB phenology and species composition in vineyards in the South Okanagan. Bark was stripped from randomly selected grapevines in two infested blocks, MBs were observed, and PCR and barcoding were done in the lab. Genetic, phenological, and morphological characters supported a higher diversity of MBs than previously described, with at least three distinct groups. The presence of multiple MB species in vineyards provides a possible explanation for challenges in detection and treatment of mealybug infestations.

List of presenters, coauthors, and abstracts, cont.

Julie Sieg (University of British Columbia), Cori Dixon (Community Volunteer), Sue Elwell (Community Volunteer), Shirley Morrison (Community Volunteer), Kathryn Poole (Community Volunteer), Ellen Scott (Community Volunteer), Dennis St. John (Community Volunteer), and Michelle Tseng (UBC)

Title: Showy milkweed (*Asclepias speciosa*) distribution and insect community composition at the northern range of the western monarch butterfly (*Danaus plexippus*)

Abstract: The monarch butterfly (*Danaus plexippus*) is one of the most iconic butterflies worldwide. Alarming, the North American population has declined steadily over the last three decades. The western population in particular has fallen substantially from overwintering numbers in the millions to less than 10,000. Most research on monarch butterfly ecology has focused on the eastern population. Much less is known about the western population and in particular, almost no studies have investigated monarch ecology in BC, the northern most breeding region. We address this knowledge gap by repeating a 2014 BC Government survey of 149 sites of *Asclepias speciosa*, the only native monarch host plant in this region. For 18 focal milkweed sites, we also quantified the associated insect and spider community. Overall, we document little change in milkweed patch number in smaller sites, but all larger sites now contain fewer milkweed patches. Additionally, we found a statistically significant association between the insect community and the likelihood of adult monarch visitation. However, we observed very few adult monarchs throughout the sampling period and thus these results should be interpreted with caution. Our study provides much-needed ecological information on the northern breeding areas of the western monarch.

Madison Khashan (Agriculture and Agri-Food Canada), Paul Abram (Agriculture and Agri-Food Canada)

Title: Sizzle or Settle? Realistic high temperatures could cause an egg parasitoid to abandon its hosts

Abstract: High temperature can influence insect behaviour and their reproductive performance. Many insects rely on behavioural responses (e.g., moving to cooler microclimates) to cope with heat stress, but these adjustments could trade off with short-term reproductive success. Some parasitoid wasps must endure the thermal environment selected by their hosts when the life stage they attack is stationary (e.g., eggs and pupae). We tested whether realistic high temperatures could cause the egg parasitoid, *Trissolcus japonicus*, to abandon parasitizing its host egg patches, *Halyomorpha halys*, in favor of cooler microclimates. In the field, egg patches could exceed air temperature by more than 10°C and reach temperatures that caused parasitoids to abandon patches in our laboratory trials. Females exposed to higher temperatures during bouts of parasitism left host egg patches sooner regardless of the number of eggs in a patch. When presented with lower quality hosts, the parasitoid abandoned patches even faster at high temperatures. If heat stress causes parasitoids to abandon hosts more frequently, it could reduce parasitism rates and make biological control less effective during the more frequent heat waves that are predicted as climate warming progresses.

List of presenters, coauthors, and abstracts, cont.

Michelle Ma (University of British Columbia; Agriculture and Agri-Food Canada), Asim Renyard (Agriculture and Agri-Food Canada), Andrea Brauner (Agriculture and Agri-Food Canada)

Title: Leafhopper Phenology: Insights for Pest Management

Abstract: Pesticide use can have harmful impacts to the environment and beneficial insects when over used or incorrectly applied, highlighting the importance of targeted pest management strategies. Understanding pest phenology can allow strategically timed sprays to target population peaks and vulnerable life stages. Tracking an organism's phenological development in growing degree days (GDD) is a standardized and reliable way to predict life history events. *Erythroneura ziczac* (Virginia Creeper leafhopper) (Hemiptera: Cicadellidae) is a common pest in the Okanagan that feeds on grape leaves, causing leaf damage, delays in grape development, vector diseases, and weakened vines. No known phenological models for *E. ziczac* exist currently, but identifying when vulnerable life stages occur is key to effective population control. Life stages were tracked based on GDD to predict trends for peak nymph stages and 80% egg hatch. Data across 2022-2025 determined two peaks in all development stages which occurred at consistent GDD across years early in the season, but were more variable as the season progressed. 80% egg hatch occurred shortly after the first peak of early nymphs. Due to the variability later in the season, predictive models should target *E. ziczac* earlier in the season to reduce unnecessary pesticide applications.

Rachel Wong (SFU), Tyler Nelson (AAFC), Gerhard Gries (SFU) and Chandra Moffat (AAFC)

Title: Who is who: Identification and interactions of *Larinus minutus* and *Bangasternus fausti* within diffuse knapweed

Abstract: Biological control re-unites invasive species with their specialist natural enemies to provide top-down population regulation. Diffuse knapweed has been controlled in North America since the 1990s using the seed-head weevil *Larinus minutus*. However, since 2020, *Bangasternus fausti* has been found in British Columbia, potentially competing for seed heads or enhancing control through synergy with *L. minutus*. To effectively evaluate the interactions and timing of these two weevils occupying the same niche requires identifying them during the larval stage, however, identifying weevil larvae is impossible using morphology alone. In this study, we developed species-specific primers to track larval phenology by extracting and amplifying DNA from dissected seed heads. We identified the primers Lm150 and Bf1_9extra to effectively identify larval stages of both *L. minutus* and *B. fausti*. *L. minutus* was ten times more abundant than *B. fausti*. *B. fausti* larvae appeared in early July and mid-August for dissections, and most *B. fausti* emerged in August through rearing. *L. minutus* larvae were present from July to September in dissections and rearing.

List of presenters, coauthors, and abstracts, cont.

UNDERGRADUATE PRESENTATIONS - SHORT-FORM

Ian Polard (University of British Columbia-Okanagan; Agriculture and Agri-Food Canada), Chase Mason (University of British Columbia Okanagan), Tyler Nelson (Agriculture and Agri-Food Canada), Christine Cock (Agriculture and Agri-Food Canada), Hume Douglas (Agriculture and Agri-Food Canada) Andres Mancera Barreto (Agriculture and Agri-Food Canada, University of British Columbia Okanagan), and Chandra E. Moffat (Agriculture and Agri-Food Canada)

Title: Testing the accuracy of morphologically-based identification methods for discerning among two species of weed biocontrol agents

Abstract: Identifying insects to the species level can be difficult in a lab, let alone while taking samples in the field. Yet, correct insect identification is essential for accurately describing biodiversity and for managing pest infestations. Two closely related species of Chrysolina beetles (Coleoptera: Chrysomelidae) were released for biological control of invasive weed St. John's wort (SJW, *Hypericum perforatum* L.) in Canada in the 1950s. Discerning these two species, and their sexes, is an ongoing challenge impacting biocontrol effectiveness. Distinguishing among Chrysolina beetles are morphological characteristics that have led to inconsistent identification results and unreproducible data. To re-assess which characters reliably differentiate *Chrysolina hyperisi* Forst. and *Chrysolina quadragemina* Suffr.; we collected 49 Chrysolina beetles in the Okanagan Valley of British Columbia and assessed their colour, elytra length, abdominal indentation status, and tarsi width, all traits which can be assessed in the field. We dissected each specimen to assess their aedeagus length and if their aedeagus was horned or not, which would be difficult to do in the field. Samples were then taken to obtain genetic sequences, further identifying their species. Through our results, we aim to increase the ease and reliability of identification in the field.

Joanna Tate (University of the Fraser Valley), Alida Janmaat (University of the Fraser Valley)

Title: Phenology of Hemlock Woolly Adelgids (*Adelges tsugae*) in the Lower Mainland

Abstract: The Hemlock Woolly Adelgid (HWA), an invasive pest from Japan, poses a significant threat to hemlock trees, particularly in the eastern United States. However, it has a much lower impact on western hemlock (*Tsuga heterophylla*) in the Pacific Northwest, likely due to natural tree resistance and the presence of predators that keep HWA populations in check. In light of these differences, the current study aimed to monitor HWA populations specifically on western hemlock in British Columbia. The phenology of the hemlock woolly adelgid sistens and progrediens generations was monitored by collecting branch samples from infested hemlock trees across size sites in the Lower Mainland between February and October 2025. These samples were analyzed for mortality, density, timing of oviposition, emergence of nymphs, synchronicity with bud break, and the end of aestivation. The findings will be discussed in light of phenological patterns observed in eastern populations and compared with earlier studies conducted in the Pacific Northwest.

List of presenters, coauthors, and abstracts, cont.

Bennett Klinger (University of British Columbia-Okanagan), Lael Parrott (University of British Columbia Okanagan), Hannah Friesen (Agriculture and Agri-Food Canada; University of British Columbia Okanagan)

Title: Webs and Wines: Spider diversity and non-native range expansion in Okanagan vineyards

Abstract: The expansion of the viticultural industry in the Okanagan Valley has potential to cause fundamental shifts in the native ecosystem; spiders, being effective bioindicators, posit a mode of measuring these changes. Across 2024 and 2025, we conducted the first large-scale sampling of spiders in vineyards and adjacent semi-natural habitats across the Okanagan Valley. Over 11000 spiders were collected and identified, representing over 20 families. Family distribution across vineyard types and habitats is consistent with feeding strategy, pointing to functional guild as a potential touchstone for persistence in vineyards. This study also resulted in the discovery of established populations of *Zodarion rubidum* (Araneae: Zodariidae), a non-native species that made up over a third of the samples across both years. This observed range expansion marks the first record of *Z. rubidum* in the Okanagan, the northern-most record in North America, and the largest sampling yield worldwide. The intensity and spread of the discovered populations indicate a high capacity for survival and reproduction in the Okanagan, raising concerns over the potential impacts of *Z. rubidum* on native spiders and trophic cascades.

Ryan Lam (Agriculture and Agri-Food Canada; Simon Fraser University), Yonathan Uriel (Agriculture and Agri-Food Canada - Agassiz Research and Development Centre), Ikkei Shikano (University of Hawaii), Tara Gariepy (Agriculture and Agri-Food Canada - London Research and Development Centre), Michelle Franklin (Agriculture and Agri-Food Canada - Agassiz Research and Development Centre)

Title: Developing a fungal tree band for management of the invasive spotted lanternfly (*Lycorma delicutula*)

Abstract: Entomopathogenic fungi, such as *Beauveria bassiana* are widely used microbial control agents for insect pest management. Entomopathogenic fungi have the benefit of infecting a wide-range of host insects through contact with fungal spores, which allows for exploration of non-conventional modes of applications such as tree bands, and vectoring systems to target insect pests. The invasive spotted lanternfly (SLF), *Lycorma delicutula* is an imminent threat to Canada, with populations of SLF established in the eastern USA and reported individual sightings across the Canadian border in Ontario. Here, we aim to develop a fungal tree band using an oil-formulation containing the biological insecticide, Botanigard formulated with *B. bassiana*. As a first step, we tested the long-term viability of *B. bassiana* spores when used in a tree band formulation outdoors in shade and direct sun. We measured the percentage of viable spores every 7 days over the course of one month. Under direct sunlight, the percentage of germinated spores declined rapidly after a week, however under shade conditions, viable *B. bassiana* spores persisted for up to three weeks. The next step will be to test the efficacy of the *B. bassiana* tree band formulation on SLF under laboratory conditions.

List of presenters, coauthors, and abstracts, cont.

Shayla Dao (University of the Fraser Valley), Harley Gordon (UFV)

Title: Histological Comparison of Eastern and Western Hemlocks and the impact on Adelgid Infestation

Abstract: This study investigated the histological and biochemical differences between Eastern Hemlock (*Tsuga canadensis*) and Western Hemlock (*Tsuga heterophylla*) to determine potential structural deterrents against Hemlock Woolly Adelgid (HWA; *Adelges tsugae*). HWA is a sap-feeding insect that severely impacts *T. canadensis*, while *T. heterophylla* shows resistance. The hypothesis proposed that morphological features such as epidermis thickness, xylem and parenchyma ratios, and trichome density may contribute to resistance. Samples from both species were collected and processed using paraffin embedding, sectioned via microtome, and stained with Toluidine Blue and Phloroglucinol. Microscopic analysis revealed no significant differences in tissue ratios or trichome density between the species. Surprisingly, *T. canadensis* exhibited higher trichome counts despite being more susceptible to HWA. These findings suggest that structural morphology does not account for resistance in *T. heterophylla*. Metabolite analysis revealed significant differences in the volatile chemistry of Eastern and Western Hemlock Trees.

Asim Renyard (Agriculture and Agri-Food Canada), Andrea Brauner (Agriculture and Agri-Food Canada), Jay Nelson (Agriculture and Agri-Food Canada), Hamody Sabih (Agriculture and Agri-Food Canada)

Title: Introduction to the Grape and Tree Fruit Entomology Program at the Summerland Research and Development Center.

Abstract: British Columbia's Okanagan valley is a major agricultural hub in Canada for tree fruits and winegrapes. In the face of rapid urban and agricultural development as well as anthropogenic climate change, the region faces numerous challenges to production while conserving biodiversity. The grape and tree fruit entomology program at the Summerland Research and Development Center seeks to identify sustainable management practices for insect pests and insect-vectored plant diseases while supporting beneficial insect populations. In vineyards, growers manage several insect pests, including scale insects, mealybugs, and leafhoppers. These insects cause damage directly through feeding and/or vectoring viruses to grapevines. Our program currently studies pest insect phenology, dynamics of insect vectors of plant diseases, and new spray and cultural control tactics for these pests. We also explore how vegetation within and surrounding vineyards affect beneficial insect populations.

List of presenters, coauthors, and abstracts, cont.

PROFESSIONAL PRESENTATIONS

Bonnie Zand (Native Bee Society of British Columbia), Lincoln Best (Oregon State University), Jen Larsen (Oregon State University)

Title: The BC Bee Atlas – leveraging the power of volunteers to inventory native bee biodiversity

Abstract: The Native Bee Society of BC is a non-profit organization dedicated to education and conservation for BC's more than 500 native bee species. Our flagship project, the BC Bee Atlas trains community scientists through the online Master Melittologist program to document flowering plants and their wild bee fauna. The project leverages automated data production and management hosted by Oregon State University to support volunteer collections and specimen curation. Volunteers are trained in survey methods, pinning, labeling, taxonomy, and floral host vouchering using iNaturalist. During the 2024 season, volunteers collected 2617 bee specimens during 681 sampling events, from 200 species of plants. With 80% of the 2024 specimens IDed to species, thus far the project has documented bees from all six families present in BC, as well as 36 genera and 165 species, one third of all bee species recorded from BC. In addition to native bee survey, program volunteers also support the Native Bee Society of BC's education programs through speaking engagements, bee walks and tabling events.

Brian Van Hezewijk (Canadian Forest Service), Lara Payne (Canadian Forest Service), Vince Waring (Canadian Forest Service)

Title: Using historical data to predict the introduction and growth of spongy moth populations in Western Canada

Abstract: Since the widespread establishment of spongy moth in Eastern Canada in the 1970s and 80s, an intensive monitoring and eradication program has been in place to prevent the spread of this invasive pest into Western Canada. Over the past four decades, more than 200,000 pheromone traps have been deployed in British Columbia alone, capturing approximately 3,700 moths. We used this extensive dataset to examine spatial and temporal patterns of introduced populations and their subsequent growth. From 1986-2023, 376 unique introductions were identified. The annual rate was strongly correlated with periods of widespread defoliation in Ontario and was spatially correlated with human population density in British Columbia. Only 20% of introduced populations exhibited positive growth rates, and most of the others disappeared after a single year. The locations of populations that grew quickly and subsequently required eradication were predicted well by an existing climatic suitability model. The implications for refining the existing detection and eradication strategies for this important pest will be discussed.

List of presenters, coauthors, and abstracts, cont.

Carly McGregor (University of British Columbia), Juli Carrillo (University of British Columbia)

Title: Floral alleys may support pollinators and parasitoid wasps in blueberry crops

Abstract: Insect species such as pollinators and natural pest predators can support crop growth; however, they are especially impacted by habitat loss due to agricultural intensification. Alleyway cover-cropping is an emergent habitat amendment technique that can support these beneficial insects on farms by providing floral and/or nesting resources through the addition of functional plant species between crop rows. Blueberry is an important crop in BC, and it benefits particularly from ecosystem services provided by wild insects. Specifically, bumble bees are more effective than honey bees at blueberry pollination, and parasitoid wasps help control the Spotted-Wing Drosophila, a berry pest of concern in our region. In 2023, we trialed a selection of functional flowering plants for establishment success and feasibility for use in floral alleys. Based on trial results, we piloted floral alleys at the UBC Farm's blueberry crops to investigate their potential for supporting pollinators and parasitoid wasps compared to business-as-usual alleys. In both 2024 and 2025, we measured plant establishment, pollinator visits to flowers, and parasitoid abundance in our study plots. Preliminary analyses suggest the establishment of floral alleys increases beneficial insect activity near blueberry crops.

Chandra Moffat (Agriculture & Agri-Food Canada), Hester Williams (BSI-MWLR), Sonja Stutz (CABI Switzerland), Phil Weyl (CABI Switzerland), and Francesca Marini (Biotechnology and Biological Control Agency, Rome)

Title: Update on federal research to proactively reduce the risk spotted lanternfly poses to Canada

Abstract: Biological control programs typically target invasive species directly, but indirect biocontrol - reducing the abundance of a species that a target invader depends on - may also be effective. The spotted lanternfly (*Lycorma delicatula*, SLF), invasive in the U.S. since 2014, poses major threats to horticulture, forestry, and natural ecosystems, and is now approaching Canada. No host-specific biocontrol agents have yet been identified for SLF, and current management relies heavily on insecticides. However, SLF has a strong association with the invasive Tree of Heaven (*Ailanthus altissima*, ToH), a preferred host that supports its development and reproduction, though SLF can survive without it. ToH is widespread in parts of the U.S. and Canada, often overlapping with grape-growing regions. We began investigating ToH in 2019 due to its own severe environmental impacts and are now assessing the feasibility of a biocontrol program in Canada. Two candidate agents are under consideration for release. If approved and effective in reducing ToH abundance, this program could serve as an indirect biocontrol strategy for SLF by limiting its preferred host and reducing its potential for establishment and spread, particularly in Canada.

List of presenters, coauthors, and abstracts, cont.

Juli Carrillo (University of British Columbia)

Title:Habitat Amendments in Agriculture Support Diverse and Abundant Beneficial Insect Communities

Abstract: Habitat restoration and other agricultural diversification practices may harness the benefits of vegetationally diverse habitats on insect communities to increase beneficial insect populations and diversity. We investigated how the arthropod community, and more specific beneficial insect taxa, responded to agricultural habitat amendments in terms of abundance, diversity, and community structure across multiple years and sites in the lower mainland of British Columbia Canada. We found that grassland-set asides supported higher abundances of both predatory and phytophagous insects compared to conventional cropped fields. More specifically, grassland-set asides supported more diverse and abundant communities of two important insect taxa, ground beetles (Family: Carabidae) and parasitoid wasps (Order: Hymenoptera). In addition, grassland set-asides supported significantly different communities of both taxa compared to crop fields. These results suggest that semi-natural agricultural habitat amendments provide support for an abundant and diverse community of both beneficial and phytophagous arthropods.

Jessie Moon (Agriculture and Agri-Food Canada, Simon Fraser University), Jessica Fraser (Agriculture and Agri-Food Canada, Université de Montréal), **Paul Abram (Agriculture and Agri-Food Canada; presenting author)**

Title: A non-native parasitoid facilitates a resident parasitoid's development in an invasive pest

Abstract: Some insect parasitoid species can facilitate the development of other parasitoid species on a shared host. *Asobara* cf. *rufescens*, a resident (i.e. possibly native or previously introduced) parasitoid of drosophilid fly larvae in North America, has very low developmental success on the invasive fruit pest *Drosophila suzukii* in the laboratory, but often emerges from field-collected *D. suzukii*. We hypothesized that the successful development of *A. cf. rufescens* in *D. suzukii* in the field may be facilitated by *Leptopilina japonica*, a recently introduced non-native parasitoid of *D. suzukii*. Indeed, in laboratory experiments, we found that *A. cf. rufescens* has greatly increased developmental success on *D. suzukii* larvae in the presence of *L. japonica*. Most instances of successful *A. cf. rufescens* parasitism occurred when it laid eggs in *D. suzukii* larvae after they were exposed to *L. japonica*. We hypothesize that *A. cf. rufescens* is likely acting as a kleptoparasitoid, and that the starting point for this new ecological interaction was *A. cf. rufescens* unsuccessfully attacking *D. suzukii* in the absence of *L. japonica*. The recent arrival of *L. japonica* may have partially 'rescued' *A. cf. rufescens* from an evolutionary trap and resulted in an expansion of its host range.

List of presenters, coauthors, and abstracts, cont.

Rob McGregor (Douglas College), Wim van Herk (Agriculture & Agri-Food Canada), Gabrielle Bourassa-Tait (Agriculture & Agri-Food Canada)

Title: Responses of ground beetles (Coleoptera: Carabidae) to ground-based light traps in southwestern British Columbia

Abstract: Pitfall traps fitted with white, blue, or green LED lights captured 3 – 5× more *Agriotes lineatus* and *Agriotes obscurus* click beetles (Elateridae) in the field compared to traps fitted with red LEDs or traps without lights. The same traps, deployed in Agassiz BC in 2022, also collected a large number of carabid beetles. The majority of carabids captured early in the trapping period (late April – end May) were *Nebria brevicollis*, a species recently introduced in BC. Mean trap captures of *N. brevicollis* in traps with white, blue or green lights were significantly higher than those in traps without lights. Many fewer *N. brevicollis* were collected in traps in June presumably because beetles of this species had entered summer aestivation. Carabid beetles collected in June were predominated by *Pterostichus melanarius* and *Calathus fuscipes*. Trap captures of *P. melanarius* did not vary by colour of light but captures of *C. fuscipes* were also higher in traps with white, blue or green lights than in traps without lights. Responses of carabid beetles to light and some implications for using light traps to monitor carabid beetles are discussed.

Tamryn Kennedy (Kwantlen Polytechnic University), Michelle Franklin (AAFC), Lydia Tymon (Washington State University-NWREC), Lyndsey Baillie (KPU), Tracy Hueppelsheuser (BCMAF), Paul J. Adams (KPU)

Title: Investigating potential cryptic speciation of blueberry gall midge (*Dasineura oxycoccana*) from cultivated highbush blueberries (*Vaccinium corymbosum*) in the Pacific Northwest

Abstract: A new species can arise without any visible differences, known as cryptic speciation. An insect that damages highbush blueberries (*Vaccinium corymbosum*), the blueberry gall midge (*Dasineura oxycoccana*), was hypothesized to have formed a new cryptic species that is more harmful to this economically important crop. An observed increase in tip-dieback in *V. corymbosum* was investigated through sequencing the CO1 mitochondrial gene of *D. oxycoccana*, generating a phylogenetic tree, and performing fragment length analysis (FLA) to identify both SNP and microsatellite variations, potentially revealing distinct populations. The CO1 sequences had near perfect alignment expect for three SNPs present in four sequenced samples and six NCBI database samples. PCoAs and Bayesian clustering analysis of the FLA data showed no distinct population clustering, and individuals from each of the six collection sites do not possess a unique ancestry; thus, supporting that these sites are not genetically isolated and there is evidence of gene flow between populations. These results suggest that a cryptic speciation event has not occurred.

List of presenters, coauthors, and abstracts, cont.

Andrea Brauner (Agriculture and Agri-Food Canada), Tyler Nelson (Agriculture and Agri-Food Canada) and Tom Lowery (Agriculture and Agri-Food Canada)

Title: Soft Scale Killers: Natural Enemies of Cottony Vine Scale

Abstract: Cottony vine scale (CVS), *Pulvinaria vitis* (Hemiptera: Coccidae) is a significant pest of grape vines. While direct losses due to feeding is rare, CVS vector viruses which reduce yield and alter wine flavour. The Okanagan valley is a major wine grape growing area in Canada, yet little is known about the biodiversity of CVS natural enemies in this region. Surveys were conducted at the Summerland Research and Development Centre experimental vineyard from 2019 to 2024 to determine the natural enemy composition of CVS. Parasitoids from nymph and adult females were reared from both on-vine collected CVS and from CVS infested sentinel potted grape plants placed in the vineyard. Through taxonomic and molecular identifications, it has been determined that at least 6 different parasitoid species from two different families (Hymenoptera: Aphelinidae and Encyrtidae) have been reared. The dominant parasitoid species reared was *Coccophagus scutellaris* (Hymenoptera: Aphelinidae) accounting for at least 90% of all reared parasitoids. Two species of silver flies, *Leucopis* (*Leucopmyia*) *pulvinaria* and *L. ocellaris* group (Diptera: Chamaemyiidae), egg/larval predators, were reared from 93% of CVS ovisacs collected in 2019. Knowledge from this research could be used to enhance biocontrol of CVS through conservation or augmentative biological control.

ESBC 2025 AGM

LINKS & FEEDBACK

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A thank you to the organizing committee!

Michelle Franklin, Juli Carrillo, Michelle Tseng, Sandra Gillespie, Adam Blake, Yonathan Uriel, Matthew Tsuruda, Kathleen Furtado and Jacob McPherson.

ESBC 2025 COMMUNICATION SURVEY

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