

The Entomological Society of Manitoba

Newsletter



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About the ESM Newsletter

The Entomological Society of Manitoba Newsletter is published three times per year. It is a forum whereby information can be disseminated to Society members. As such, all members are encouraged to contribute often. The Newsletter is interested in opinions, short articles, news of research projects, meeting announcements, workshops, courses and other events, requests for materials or information, news of personnel or visiting scientists, literature reviews or announcements and anything that may be of interest to ESM members.

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Editors Comment

Happy 2023!

I am writing this newsletter in late 2022 but I imagine it will be 2023 by the time it is distributed.

2022 was a year to remember – a lot of “firsts” happened. First time meeting in-person again for our ESM AGM since the pandemic. First time in 3 years that classes were held in person again. First time ESC was able to meet together again – and with ESA too! First time we were able to sit in the Animal Science building to watch the Entomology Seminar Series together.

A lot has changed since 2020 – some positives, some negatives, but overall we have persevered through these trying times. 2023 be another year of finding our way to our “new normal” which hopefully is a mix of some of the positives from both the pre-pandemic and pandemic eras.

Happy reading,

Kelsey Jones
ESM Newsletter Co-Editor

President's Report

By Kateryn Rochon

One last message from me, now as Past President. As the year ends, we start to reflect on the year that has passed and make plans for the year to come.

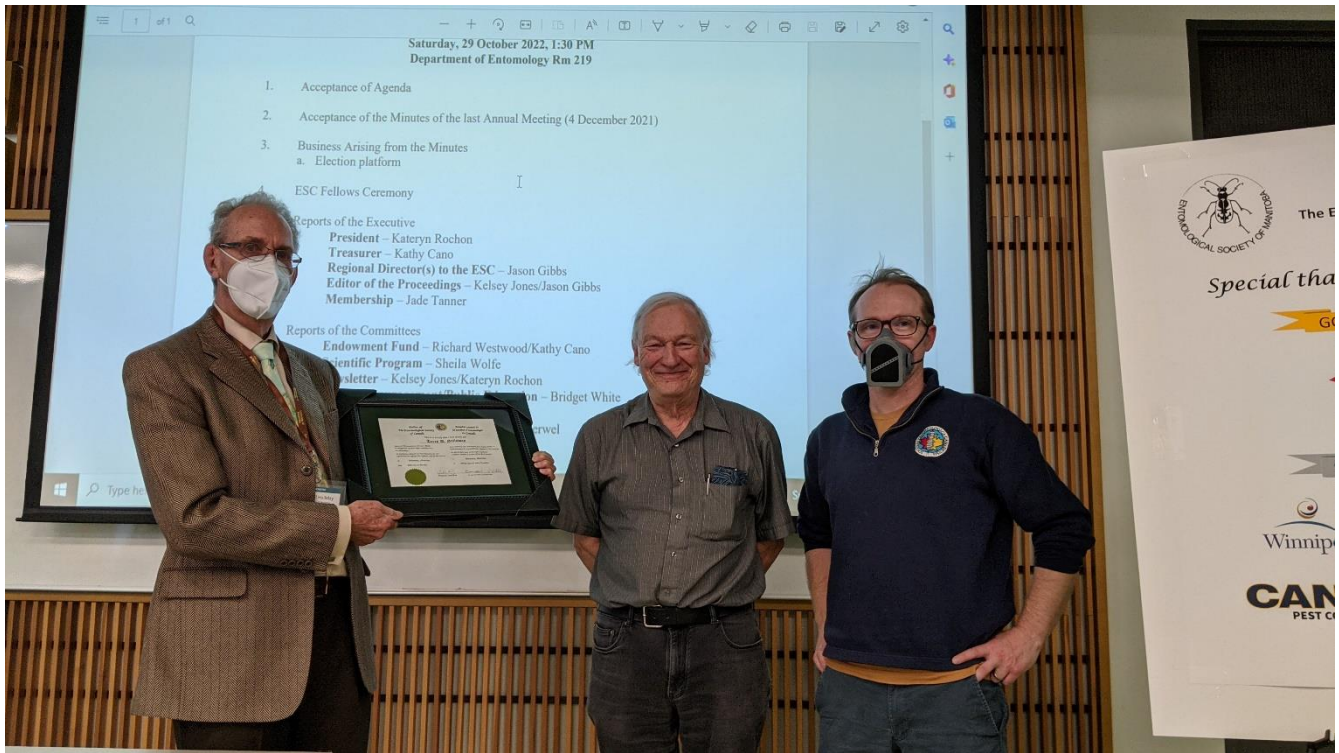
For many of us, this year was a return to familiarity in many aspects of life, whether reconnecting with colleagues or wearing proper shoes and structured clothing again (I know it's not just me). After two years of online meetings and presentations, it was lovely to gather for our annual meeting in person. The Executive continues to meet online, as it remains a convenient way to meet without having to commit extra time and resources to travel to a specific location in Winnipeg. However, when it comes to discussing science, sharing results and making real connections, nothing beats meeting in person. Based on the full house at the mixer at Trans-Canada Brewery, I can say ESM members were eager to reunite. I believe you will find, in this edition, the details of the Awards ceremony, which took place at the mixer, including scholarships and student competition winners.

Another ESM highlight this year is the recognition by the Entomological Society of Canada of two ESM members, Dr. Terry Galloway and Dr. Bob Lamb, for their major contribution to the field of entomology. Terry and Bob became Fellows of the Entomological Society of Canada this year, and their awards were presented to them during the business meeting portion of this year's AGM.

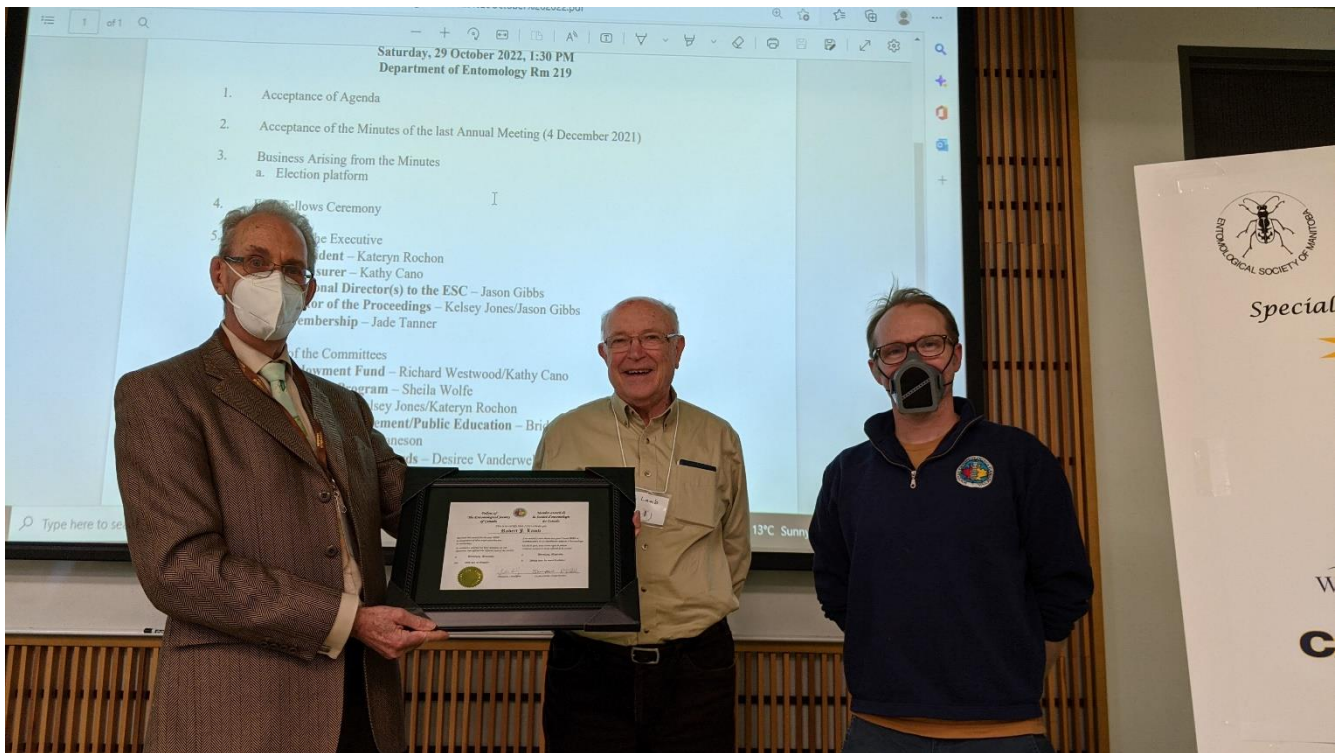
As we plan for the year to come, I would once again encourage you to get involved in the Society. We have not had opportunities to host events for a few years, and we need some of your fresh ideas to prevent rust from setting in! So as the snow covers Manitoba for a few months, why not start pondering ideas for National Insect Appreciation Day (June 8) and use the ESM network to find like-minded people to help you realize your project?

Kateryn
ESM Past President

Dr. Terry Galloway, a Fellow of the Entomological Society of Canada



Dr. Bob Lamb, a Fellow of the Entomological Society of Canada



Notable Manitobans on the Awards Hall of Fame: Donna Giberson (completed her MSc and PhD in Manitoba), Terry Galloway (professor emeritus at the University of Manitoba), and Bob Lamb (adjunct professor with the University of Manitoba and retired entomologist with Agriculture and Agri-food Canada in Winnipeg).



From the Regional Director
By Jason Gibbs, Regional Director to the ESC

November saw a successful Joint Annual Meeting of the Entomological Societies of America, Canada, and British Columbia in Vancouver. A new addition to the JAM was programming in support of LGBTQIA2S+, which included a mixer and insect-theme drag show, which was supported by funds from the ESC. In association with the JAM, the ESC Board of Directors met twice to discuss societal business and to appoint executive council and officers. The next joint annual meeting will be hosted by ESC and the Entomological Society of Saskatchewan in Saskatoon 15-18 Oct 2023. For those seeking more information, the meeting website is active: <http://entsocsask.ca/esc/esc-ess.html>

ESM members not currently active members of the ESC are encouraged to join. There are many opportunities to contribute to the entomological community at a national level. Students, in particular, are reminded of several awards available from the ESC. There is no obligation for students to be a member of the ESC in order to apply for awards.

I would also remind those looking to publish papers that the Canadian Entomologist is now entirely online and free open access is available for many of those with institutional associations.

ESM Newsletter Co-Editor Intro

By Justis Henault



Hi! I (he/him) am Justis and will join Kelsey as a Co-Editor of the Newsletter. I completed a Master of Science degree in February of 2022 (University of Winnipeg) where I researched the caterpillar foraging and critical habitat attributes of the endangered Poweshiek skipperling (*Oarisma poweshiek*) butterfly in Manitoba. Currently, I am searching for a PhD opportunity.

From 2015-2020 at the University of Winnipeg, I researched the ecology and monitored the populations of several other Lepidopterans-at-risk with Richard Westwood. Our reports contributed to recovery efforts of local and international communities as well as specialists in academia, non-profits (including Nature Conservancy of Canada) and multiple levels of government (Manitoba Conservation Data Centre; Canadian Wildlife Service, Environment and Climate Change Canada). Since 2021, I have continued to produce reports as an Independent Researcher, including my current preparation of the status report on the leadplant flower moth (*Schinia lucens*) for the Committee on the Status of Endangered Wildlife in Canada. Recent collaborations have generated a couple of journal articles, with more on the way!

I enjoy helping out where I can. As a member of the Steering committee for the Poweshiek skipperling International Partnership, I guide the partnership in order to maintain suitable habitat and prevent the extinction of *O. poweshiek*. I hope to accurately represent our ESM membership to help to make our society even better as the recently elected Member-at-Large.

As you might have guessed I spend a lot of time outside! Gardening or trail cycling inevitably turns into “What is that insect doing?!” Hopefully, I can help to capture and share this curiosity amongst us for our collective enjoyment in the Newsletter.



Pseudothyris sepulchralis slurping mammal poop.

Incredible Creatures:

Summit Disease: A behaviour modifying, grasshopper killing fungus

By John Gavloski

One of my more interesting insect encounters this summer was witnessing a canola field where lots of dead grasshoppers were at the tops of the plants with their legs grabbing tightly around the stems. The corpses of the grasshoppers were so thick that in some areas of the field everywhere you looked the field seemed covered with them, and at times there were dead grasshoppers clinging to other dead grasshoppers. This phenomenon is called summit disease and caused by a fungal pathogen specific to grasshoppers. It occurs when grasshopper populations are high and the right environmental conditions are present. This article explores this pathogen, and how it alters grasshopper behaviour to help it spread.



Grasshoppers infected with summit disease.

Summit Symptoms

Summit disease is caused by a naturally-occurring fungal pathogen called *Entomophaga grylli*. The genus name *Entomophaga* describes the focus of these fungi: "entomo" refers to insects and "phaga" means "to eat". Different species of *Entomophaga* are pathogens of aphids, grasshopper and moths. Grasshoppers infected with *Entomophaga grylli* exhibit a peculiar behavior of climbing to the top of the plant canopy and firmly holding the plant before they die, giving the name summit disease to this infection. This ensures widespread dispersal of the fungal spores.

Grasshoppers become infected from spores, which stick to the bodies as they seek food. These spores germinate and penetrate the insect cuticle. The fungus then multiplies in the blood and grows on internal organs.

Disease symptoms normally do not appear until the disease is in its advanced stages. Prior to death there may be a general restlessness, feeding may stop, and coordination may be reduced. Infected individuals tend to climb upwards on vegetation just before death and die with their heads pointing upward and with their legs wrapped tightly around the plant. At about the time the grasshopper dies, its body is full of several million resting spores.

Following death there may be a swelling of the abdomen to almost twice its original size. The grasshopper body becomes soft and pulpy and is easily broken up if disturbed. At this time the abdomen often curls upwards and forwards to the extent that it almost touches the thorax (middle segment in insects). About one hour after death there may appear a white, furry growth covering the insect's body. The corpse remains attached to the plants for several days until their bodies dry out and fall apart after having been digested and consumed by the fungus. As the grasshopper disintegrates, millions of fungal spores are spread on the ground, germinate, and produce more sticky spores, thus spreading the disease.



Brown specks on plants are all dead grasshoppers.

Different Summits for Different Grasshoppers

Not all species of grasshoppers are equally susceptible to *Entomophaga grylli*, and different groups of this species of fungus, called pathotypes, are known. One of these pathotypes infects grasshoppers belonging to a group called the band-winged grasshoppers. Another specifically infects grasshoppers belonging to a genus of grasshoppers called *Melanoplus*, which includes many of our pest species of

grasshoppers. A third pathotype was introduced from Australia into North America and infects both groups of grasshoppers. The pathotype that infects *Melanoplus* species only has one cycle of summit disease per year. The other two pathotypes can have multiple summit disease cycles per year. With all pathotypes, overwintering resting spores are produced at the end of the season.

Summit disease can help control grasshoppers under warm, humid conditions. It is capable of causing high mortality in grasshopper populations, but these outbreaks of the disease are usually sporadic and localized and generally occur late in the season after economic damage from grasshoppers has occurred. Regardless, the reduced grasshoppers, and reduced grasshopper egg laying caused by summit disease can be an important component reducing high populations of grasshoppers.

You may wonder, could this fungal pathogen of grasshoppers be mass produced and used as a biological insecticide. Unfortunately, it cannot be mass produced, and it is weather-dependent. But nature has its way of regulating outbreaks of grasshoppers and other animals when populations get too high.

Ed's. note: John Gavloski is an entomologist living in Carman, Manitoba. He writes a monthly article called "Incredible Creatures" for several rural newspapers in Manitoba. They are written at a basic level to introduce people to some of the common yet often not well known creatures in Manitoba, and hopefully enhance appreciation for wildlife.

ESM Student Presentation Awards Recap

First Place Oral Presentation:

Bridget White

THE ROLE OF AWNS AND HAIRY GLUMES IN SPRING WHEAT LINES AS PHYSICAL DETERRENTS TO ORANGE WHEAT BLOSSOM MIDGE, *SITODIPLOSI MOSSELLANA* (GÉHIN) (DIPTERA: CECIDOMYIIDAE) OVIPOSITION

B.A. White, C. D. S. Weeraddana, S. Wolfe, C. A. McCartney, R. J. Lamb, T. Wist, and A.C. Costamagna

The wheat midge, *Sitodiplosis mosellana* (Géhin) (Diptera: Cecidomyiidae) poses a substantial threat to spring wheat in Canada. Larvae feed on the developing kernels and cause decreased grain quality and yield loss. Currently, this pest is primarily managed using resistant wheat varieties that contain the *Sml* gene, a single, naturally occurring gene that kills the larvae. It is important not to rely on only one form of resistance, especially a single gene, as virulent biotypes may evolve over time, leading to future outbreaks and economic losses. To this end, a group of spring wheat lines with different combinations of awns and hairy glumes were developed to assess if these mechanical barriers deter wheat midge oviposition. To determine egg laying preference between the traits, adult wheat midge were introduced to choice cages containing twelve wheat spikes divided evenly between four combinations of awns or no awns with either hairy or smooth glumes, under laboratory conditions. In addition, five lines per trait class, including those tested in the laboratory, were exposed to wheat midge under field conditions to determine seed damage from wheat midge larvae. Results from both the laboratory and preliminary field trials indicate that there is no effect of hairy glumes or awns in reducing wheat midge oviposition. Within each trait class, there was high variation among lines, indicating that some of these lines may be promising in reducing egg laying but not because of the presence of hairy glumes or awns.



Second Place Oral Presentation:

Charu Sharma

TESTING IF OA AFFECTS THE REPLICATION OF VIRUSES IN HONEYBEES IN THE ABSENCE OF VARROA MITES

C. Sharma, R. Currie, and Z. Rempel

Honey bees face heavy colony losses and *Varroa destructor* is considered a major reason for this loss. This ectoparasitic mite is a vector for the deformed wing viruses (DWV) which is also deadly for honey bees. Oxalic acid is used to control varroa mites, but we don't know if it affects the virus replication in honey bees. To fill this knowledge gap, we did a cage experiment by treating varroa-free honey bees with OA. Varroa mites could alter the level of viral titers, so we used Australian honey bees which lack varroa infestation due to geographical isolation. For the experiment, we treated honey bees in 10 cages with OA and 10 cages were left untreated as a control. Half of the treated cages and control cages were inoculated with unpurified viruses and the other half were not inoculated but had natural virus infestation. Unpurified viruses in the inoculum were predominantly DWV. The level of viruses in bees was measured by qPCR. The results did not show any significant difference in the level of viral titers in the OA-treated cages and untreated cages. We will be testing the viral titers in the live bees samples that were collected before and after the experiment.



First Place (tied) Poster Presentation:

Madeline Dupuis

ASSOCIATION BETWEEN INFESTATION PARAMETERS OF NASAL MITES (ACARI: RHINONYSSIDAE: *TINAMINYSSUS* SPP.) AND HOST BODY CONDITION IN ROCK PIGEONS (AVES: COLUMBIDAE: *COLUMBA LIVIA*) IN MANITOBA.

M. Dupuis, M. Krul, T. Galloway, and K. Rochon.

Rock pigeons (*Columba livia*) are host to a variety of parasites including nasal mites (Rhinonyssidae: *Rhinonyssus* spp.). While distribution and host association have been studied through surveys in Canada, there are gaps in the ecological relationships of these parasites. We salvaged pigeons to determine nasal mite prevalence and mean intensity as well as to examine the relationship between host body condition and the determined infestation parameters. Forty-four pigeons salvaged from Manitoba Wildlife Haven were given a body condition score (BCS) from 1-5, with 1 being emaciated and 5 being obese. Their respiratory passages were flushed with a curved 12 ml Monojet™ 412 syringe with soapy water so that it ran out of the mouth onto a 90 µm sieve. The sample was preserved in 95% ethanol until the mites were counted. Data were analyzed using Quantitative Parasitology (QPWeb). Pigeons were infested with nasal mites, *Tinaminyssus* spp. Prevalence and mean intensity were 56.8% and 16.9 mites per bird respectively. Prevalence of infestation was significantly higher in pigeons with poor body condition scores. There were no significant differences between intensity and body condition. Additional research is required to understand the host-parasite relationships between birds and nasal mites.

First Place (tied) Poster Presentation:

Merrille Krul

THE EFFECTS OF BODY CONDITION SCORE AND COLOUR MORPH OF ROCK PIGEONS (*COLUMBA LIVIA*) ON CHEWING LOUSE (PSOCODEA: PHTHIRAPTERA) INFESTATIONS IN MANITOBA

M. Krul, M. Dupuis, T.D. Galloway, and K. Rochon

Taxonomy and infestation parameters of chewing lice have been well documented in Manitoba. The objectives of this research were to determine if there were relationships between body condition score or colour morph of rock pigeons (*Columba livia*) and the prevalence or mean intensity of their chewing louse infestations. Forty-four pigeons were used for this research. Euthanized pigeons were obtained from Manitoba Haven Rehabilitation Hospital and washed in a bucket of hot water, twice with and once without liquid dish detergent. The water was drained through a 90 µm sieve, and the collected chewing lice were identified and counted. Pigeons were body condition scored on a scale of 1-5 using a chart; these body condition scores were divided into three categories for data analysis. Pigeons were divided into five categories based on colour morph, ranging from light-coloured to melanistic. Data were analyzed using Quantitative Parasitology (QPWeb). Total chewing louse prevalence was 97.7%, and mean intensity was 174.3. There were no significant differences in prevalence or mean intensity of chewing lice between categories of either body condition score or colour morph. Information concerning the relationship between louse infestations and bird body condition is sparse; this research provides new information.

ESM Student Achievement Award: Awarded to a student who is in or recently completed a Bachelor's degree program. This award recognizes students who have shown exceptional interest in entomology as evidenced by their insect collections, insect photography, published articles of entomological interest, insect experiments and/or outstanding contributions during summer employment.

This year's winner of the ESM Student Achievement Award is Denice Geverink (University of Manitoba). Denice is an outstanding student, and is working towards a B.Sc. in Environmental Science at the University of Manitoba, with a minor in Entomology. In the words of her nominator, Denice has been the "heart and soul" of the Costamanga lab (Department of Entomology, University of Manitoba) for the past five years, and has been involved in many entomology-related projects, both as a technician and as a researcher. Denice has also been an important contributor to the ESM Youth Encouragement program for many years, and has served as an undergraduate student representative for the Department of Entomology for the past four years. Denice has also assisted in the maintenance of various insect colonies at the Department of Entomology, used for teaching and extension activities.

Orkin Student Award: This award is designed to foster and encourage student interest in general Entomology including natural methods of insect pest control and the proper use of insecticides. Candidates must have a demonstrated interest in entomology, superior scholastic ability, high research potential, originality and industriousness in their university courses and/or summer work.

In an unusual development, this year's winner of the Orkin Award is a duo that was co-nominated in a joint nomination letter by two supervisors: the committee is pleased to announce that the winners this year are Madeleine Dupuis and Mireille Krul. Orkin Canada will graciously cover the full award for both students this year. Both Madeleine and Mireille have made the Dean's Honour List every year since beginning their degree programs. Both students show a keen interest in entomology, and plan to minor in entomology. Both students secured prestigious summer research awards, and were extremely industrious in their summer projects in veterinary entomology. Towards the end of the summer, Madeleine and Mireille collaborated on a project focusing on pigeon arthropod parasites. On their own initiative, they divided the project so that Mireille analyzed the data related to chewing lice, while Madeleine did the same for the nasal mites. They presented their work as posters at the scientific meeting. In their joint nomination, the two supervisors commented that they cannot "say enough about the collaboration and initiative of these two students, who were able to accomplish so much together in a remarkably short time."

ESM Student Leadership and Service Award: The name of this award was changed this year to better reflect the qualifications of the applicants/nominees. This award recognizes a student (at the graduate or undergraduate level) who has promoted the goals of the Entomological Society of Manitoba (i.e., to foster the exchange of information on entomology and to further the spread of entomological knowledge) through their volunteer activities.

This year's winner of the ESM Student Service Award is Megan Colwell (Department of Entomology, University of Manitoba), who recently defended her PhD on the topic "A Study on Novel Transmission Routes of Honey Bee (*Apis mellifera* L.) Viruses With a Focus on the Epidemiological Role of Wax Comb", co-supervised by Professor Robert Currie (UofM) and Dr. Steve Pernal (Agriculture Canada). Megan's list of contributions is too long to list here, but highlights include serving as the Department of Entomology councillor for the UofM Graduate Student Association (three years) and President of the Department of Entomology Graduate Student Association (four years), during which time Megan was

involved in many initiatives to promote entomology, within the Department of Entomology and beyond. Megan was also awarded the Canadian Association of Professional Apiculturists Student Award of Merit for her contributions to bee research and service to the industry.

The ESM Graduate Scholarship: This scholarship is awarded to students in a M.Sc. or Ph.D. program related to entomology at the University of Manitoba, University of Winnipeg or University of Brandon. Students must be enrolled in their graduate program for at least 12 months prior to Oct 1 of the award year. This award recognizes superior scholastic ability, high research potential, and excellent communication skills.

This year there is a tie for the winner of the ESM Graduate Scholarship: Daniel Heschuk and Michael Killewald. The ESM Executive has graciously agreed to fully fund both winners with the \$2,000 award.

Daniel Heschuk (Department of Biology, University of Manitoba), is working towards his MSc in the Department of Biological Sciences (University of Manitoba) under the supervision of Dr. Steve Whyard. The title of his thesis is “Elucidating female-specific differentiation genes in the mosquito, *Aedes aegypti*.” Daniel earned his BSc in Genetics (Honours) from the University of Manitoba in 2020, and already had extensive research experience before starting his graduate work, working on different projects with three different supervisors (including one stint as a field technician on a game research in South Africa, studying the ecology of cap ground squirrels). Daniel is an excellent student, and has earned multiple NSERC USRAs as well as an NSERC CGS-M award, amongst many other prestigious awards. Daniel is a talented and productive researcher, with contributions to four publications while still an undergraduate. According to one of his references, Daniel’s fundamental research has some exciting potential applications, and so is now participating in a Lab2Market West program.

Michael Killewald (Department of Entomology, University of Manitoba) is working towards his PhD in the Department of Entomology (University of Manitoba) under the supervision of Dr. Jason Gibbs. Michael is studying the ability of wildflower plantings near crops to increase the biological diversity of beneficial insects for improved pest management, pollination, and crop yield. Michael worked in the lab of Professor Rufus Isaacs at Michigan State University during his undergraduate degree, obtaining extensive experience on integrated pest management and pollination of small fruit crops. Michael co-authored three refereed publications during this time period (one first-authored). Since starting his graduate work in 2019, Michael has already co-authored two manuscripts (one has been accepted by the prestigious *Journal of Animal Ecology*, and a first-authored manuscript is still undergoing the review process). Michael has also coauthored 11 presentations. Michael is also active in outreach events, participating in citizen science activities, and serving as Treasurer for the Department of Entomology Graduate Students Association.

Description of an Entomologist...

The following description was found on bugguide.net by Dr. Robert Wrigley and is being shared with ESM members to give everyone a bit of a laugh during the months while we cannot be out collecting specimens ourselves.

Identification

Look for perpetual squint, sunburn, poison ivy, briar scratches, burrs, bee stings, and for ticks and chiggers actively feeding. Tarsal formula usually 5-5; antennae typically obsolete; head often with distinct setae. Sexual dimorphism obvious, once even considered different species (or from different planets).

You May Be an ENTOMOLOGIST If ...

you drive with a net sticking out your car window...
you've ever looked at insect genitalia on purpose...
you have more than a dozen plastic insects but no kids...
you collect insects with a vacuum cleaner...
you wear your flashlight on your head...
you plan your vacation based on the emergence of an unusual insect...
you have a personalized license plate with an insect name on it...
you keep a jug of malt, beer and yeast mixture in your refrigerator...
your clothes smell like moth balls year-round...
you carry a vial in your pocket at all times...
you swerve to avoid an insect crossing the road...
more than half of the Tupperware containers in your freezer are full of insects...
the buzzing in your ear turns out to be an *Aphodius* from last night's blacklighting...
your best table linen doubles as a blacklighting sheet...
you stop to inspect road kills for Silphids...
you refer to your kids as grubs...
you carry a BioQuip credit card...
you pick insects out of the radiator grill of your or someone else's car...
you hang out under the street lights at a highway rest area...
you buy 90 proof alcohol to pickle insects, not your liver...
your fish tank is filled with aquatic insects instead of fish...
you have an insect tattoo somewhere on your body...
you own more insect nets than pairs of underwear...
your end table is an insect cabinet...
a field of cow pies excites you...
you own chest waders but no fishing pole...
you've ever deliberately gone to Arizona in the summer...
you have more than \$1000 worth of camera equipment to take pictures of insects...
you've ever used a kitchen strainer and a broom handle to catch aquatic insects...
you think automotive antifreeze was invented as an insect preservative...
you've ever been told "come clean these insects off the kitchen table so we can eat dinner"...
the reading material in your bathroom features the American Entomologist...
you think that a flower is missing something if there is no insect on it...

Congratulations to our 2022 election winners! We thank everyone who took the time to vote using our new platform. And we look forward to seeing what the new board members and committee chairs bring to the Entomological Society of Manitoba.

2022-2023 Executive

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President	Alberto Civetta	entsocmanitobapres@gmail.com	(204) 786-9436
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