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# Entomological Society of Manitoba

*The Entomological Society of Manitoba* was formed in 1945 “to foster the advancement, exchange and dissemination of Entomological knowledge”. This is a professional society that invites any person interested in entomology to become a member by application in writing to the Secretary. The Society produces the Newsletter, the *Proceedings*, and hosts a variety of meetings, seminars and social activities.

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The Secretary

Entomological Society of Manitoba

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# Contents

## **Submitted Paper, Scientific Note:**

|  |   |
|--|---|
| First records of the brown marmorated stink bug, <i>Halyomorpha halys</i> (Stål)<br>in Manitoba (Hemiptera: Pentatomidae)..... | 5 |
|--|---|

|   |           |
|---|-----------|
| <b>Scientific Programme Abstracts for the 2018 Annual Meeting of the<br/>Entomological Society of Manitoba.....</b> | <b>10</b> |
|---|-----------|

|  |    |
|--|----|
| Acknowledgements.....  | 25 |
| Minutes of the 73 <sup>rd</sup> Annual Business Meeting of the Entomological<br>Society of Manitoba..... | 26 |

## **Appendices**

|  |    |
|--|----|
| Appendix A: Agenda of the Entomological Society of Manitoba 72 <sup>nd</sup><br>Annual Business Meeting..... | 35 |
| Appendix B: Report of the President.....   | 36 |
| Appendix C: Report of the Treasurer.....   | 37 |
| Appendix D: Report of the Regional Director of the Entomological<br>Society of Canada.....                   | 40 |
| Appendix E: Report of the <i>Proceedings</i> Editor.....   | 40 |
| Appendix F: Report on Membership by the Secretary.....   | 41 |
| Appendix G: Report of the Endowment Fund Board.....  | 42 |
| Appendix H: Report of the Newsletter Committee.....  | 44 |
| Appendix I: Report of the Youth Encouragement and Public Education<br>Committee.....                         | 44 |
| Appendix J: Report of the Student Awards and Scholarship Committee.....<br>.....                             | 46 |
| Appendix K: Report of the Fundraising Committee.....   | 48 |
| Appendix L: Report of the Website/Archivist.....   | 48 |
| Appendix M: Report of the Common Names of Insects Committee.....   | 49 |
| Appendix N: Report of the Scrutineer Committee.....  | 50 |



## Scientific Note

# First records of the brown marmorated stink bug, *Halyomorpha halys* (Stål) in Manitoba (Hemiptera: Pentatomidae)

**Jason Gibbs and Christopher G. Ratzlaff**

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The brown marmorated stink bug, *Halyomorpha halys* (Stål), is an invasive pest introduced from East Asia to North America and parts of Europe (Hoebeke and Carter 2003, Wermelinger et al. 2008, Vétek et al. 2014). The species was likely introduced from China to the United States and subsequently spread to Canada (Garipey et al. 2014b). It was first recorded in the United States from Allentown, Pennsylvania with collections dating back as far as 1996 (Hoebeke and Carter 2003). It has subsequently spread widely across the United States and into Canada (Fogain and Graff 2011, Zhu et al. 2012). It is capable of long distance flight (Wiman et al. 2015), but may also move great distances by inadvertent human transportation (Garipey et al. 2014b, 2014a). *Halyomorpha halys* is polyphagous (Lee et al. 2013, Bergmann et al. 2016) and is considered a serious crop pest in both its native range (Lee et al. 2013) and areas where it has become established (Nielsen and Hamilton 2009b, Leskey et al. 2012). In northern parts of its range, *H. halys* has one generation per year (Nielsen and Hamilton 2009a). Adult *H. halys* overwinter in buildings and is considered a nuisance pest in homes (Inkley 2012). In Canada, *H. halys* is known to occur in Alberta, British Columbia, Ontario and Quebec (Fogain and Graff 2011, Garipey et al. 2014a). Based on habitat niche models, Manitoba is not considered a suitable climate for this pest (Zhu et al. 2012). Here we provide the first records of *H. halys* in the province of Manitoba.

A stink bug was observed flying near a light fixture in a house in Winnipeg, Manitoba on 1 February, 2017. The species was recognized as *Halyomorpha halys* and was first

documented online via a low-quality image taken with an iPhone 7 that was submitted to iNaturalist (<http://www.inaturalist.org/observations/5040745>). The second specimen was collected outside a residence northeast of Winnipeg in Oakbank on 19 October, 2017. The identifications of both stink bugs were confirmed using keys in Paiero *et al.* (2013). Both specimens are deposited in the J.B. Wallis/R.E. Roughley Museum of Entomology, Department of Entomology, University of Manitoba.

New record

Pentatomidae: Pentatominae: Cappaeini

Genus *Halyomorpha* Mayr

*Halyomorpha halys* (Stål) (Fig. 1)

Material examined. Canada: Manitoba: Winnipeg, 49.869, -97.162, 1 February, 2017, coll. J. Gibbs; Oakbank, 49.97764, -96.93384, 19 October, 2017, coll. C.G. Ratzlaff.

*Halyomorpha halys* is a serious pest of numerous crop plants and a nuisance pest in homes (Inkley 2012, Leskey *et al.* 2012). Although records of this species in Manitoba are discouraging, there is reason to suspect it may not emerge as a serious problem for Manitoba agriculture or homeowners in the immediate future. Developmental time in *H. halys* is affected by temperature extremes (Nielsen *et al.* 2008) that are likely to slow its spread into the province. This is supported by results of niche modeling, which predict the suitable range for this insect ending in northern Minnesota (Zhu *et al.* 2012). The occurrence of two males alone is not indicative of a breeding population (Garipey *et al.* 2014a). It is likely that the Winnipeg specimen was transported from Michigan in December, 2016 with the personal effects of the lead author. The origins of the Oakbank specimen are uncertain. The habit of *H. halys* of entering and residing in buildings during winter months means it can be closely associated with human belongings. This may increase the likelihood of human-mediated long-distance dispersal, leading to repeated introductions to an area. Furthermore, it may avoid the extreme cold that would limit its establishment by moving indoors. The significance of the records reported here were only evident because the authors are entomologists. Most encounters with *H. halys* by Manitobans are likely to go unreported. The prevalence of *H. halys* in Manitoba might be much greater than currently appreciated. Given the potential pest status of this species, increased vigilance for this species is prudent. The mottled brown colour, pale bands on the antenna, smooth anterolateral margin of pronotum, and alternating bands on the connexivum (Fig. 1) distinguish *H. halys* from native species. The genera *Euschistus*, *Brochymena* and *Parabrochymena* look similar, but the former lacks antennal banding and the latter two have distinctly toothed anterolateral margins of the pronotum (Paiero *et al.* 2013).



Figure 1. Dorsolateral habitus of a male *Halyomorpha halys* (Stål) collected in Winnipeg, Manitoba.

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**74<sup>th</sup> Annual Meeting  
ENTOMOLOGICAL SOCIETY  
OF MANITOBA, Inc.**

**Friday, October 19, 2018  
Freshwater Institute  
501 University Crescent  
University of Manitoba Campus  
Winnipeg, Manitoba**

**and**

**Saturday, October 20, 2018  
Room 219; Animal Science/Entomology Building  
University of Manitoba  
Winnipeg, Manitoba**

**Abstracts**

***KEYNOTE ADDRESS***

**MANAGING INSECT INVASIONS: WHAT'S WORKED, WHAT  
HASN'T, AND SOME CONTROVERSIAL NEW PROSPECTS.**

**Daniel Simberloff**, University of Tennessee, Knoxville, TN.

Modern invasion biology is a very young field, beginning in the 1980s. Although both eradication and maintenance management of some introduced insects have longer histories, invasion biologists have tended until recently to downplay eradication programmes, probably because of notable earlier eradication campaigns with disastrous non-target impacts. However, incremental improvement of existing technologies plus occasional novel approaches have led to increasingly challenging targets and impressive successes. Many non-native insects and have been eradicated from islands, and invaders

on increasingly large islands are now feasible targets. Insect invaders on both continents and islands have been maintained at low densities by biological control, and some species have been controlled short of eradication by insecticides. Failures in both eradication and maintenance management often result from insufficient long-term commitment of resources. Biological control of phytophages, in particular, has seen incremental advances in efficacy and minimization of non-target impacts. Excitement abounds over the prospect that new techniques relying on molecular genetic tools – especially RNA interference and RNA-guided gene drives – may permit eradication or maintenance management of non-native invaders with no non-target impacts in situations that have previously appeared extremely difficult or infeasible. RNA interference has already been deployed for crop plant pests, and a well-funded gene drive project targeting mosquitoes appears promising. The prospect of releasing gene drives in the environment has elicited concern, but the rapidly growing accessibility of increasingly efficient CRISPR tools means gene drives will nevertheless be deployed.

## **SYMPOSIUM**

### **Invasive Species: Impacts on Forestry to Managed Pollinators**

#### **DAWN OF THE BLOODSUCKING INVADERS.**

**Kateryn Rochon**, Department of Entomology, University of Manitoba, Winnipeg, Manitoba.

An overview will be provided of the invasive arthropod species that have or may have an impact on animal and human health in western Canada. Emphasis will be placed on invasive and exotic ticks and mosquito species and the pathogens they can transmit.

#### **BEE-YOND BORDERS: EXOTIC BEES IN NORTH AMERICA AND NEW RECORDS OF NATIVE SPECIES FOR MANITOBA AND CANADA.**

**Jason Gibbs**, Department of Entomology, Curator J. B. Wallis / R. E. Roughley Museum of Entomology, University of Manitoba, Winnipeg, Manitoba.

#### **INVASIVE SPECIES IN PRAIRIE AGROECOSYSTEMS.**

**A. C. Costamagna**, Department of Entomology, University of Manitoba.

Some of the most important pest species in agroecosystems are invasive species. I use the soybean aphid, *Aphis glycines* (Hemiptera: Aphididae) invasion in North America as a case study to illustrate some of the impacts of invasive species in agricultural landscapes. First, I show the role of extant natural enemies, including exotic species of lady beetles, in the suppression of soybean aphid populations in soybean crops. Then I show how agricultural landscape structure and interchange of predators with neighboring habitats affect the population dynamics of aphids in soybean fields in Manitoba.

### **EMERALD ASH BORER AND OTHER URBAN FORESTRY PROBLEMS THAT MIGHT ARRIVE IN CANADA.**

**John Ball**, South Dakota State University, Agronomy, Horticulture & Plant Science, Brookings, SD, USA.

## **SUBMITTED PAPERS**

### **THE PARASITOID WASP COMPLEX OF ASH LEAF-CONE ROLLER (LEPIDOPTERA: GRACILLARIIDAE) AND THEIR RESPONSE TO METHYL SALICYLATE AND GREEN LEAF VOLATILES.**

**Matthew Russell**, University of Winnipeg, Manitoba, Canada, R3B 2E9 and Maya Evenden, University of Alberta, Alberta, Canada, T6G 2R3.

In 1999, *Caloptilia fraxinella* (Lepidoptera: Gracillariidae) was introduced to urban horticultural ash trees (*Fraxinus* sp.) in Edmonton, Alberta, becoming an urban pest due to the decreased aesthetic value of infested ash trees. Since parasitoid wasps have a strong response to the release of semiochemicals caused by Lepidoptera larvae, the use of chemical release lures provides a potential method to manage *C. fraxinella* populations. *Apanteles polychrosidis*, a natural parasitoid of *C. fraxinella*, was designated as a potential vector to manage the pest. The response of *A. polychrosidis* to semiochemicals induced by *C. fraxinella* feeding is well studied; however, the multitude of parasitoid wasps found parasitizing *C. fraxinella* lack any significant investigation. In this study, we examine how the most common Hymenoptera parasitoids associated with *C. fraxinella*, *A. polychrosidis*, *Diadegma* sp., *Sympiesis* spp., and Mesochorinae, respond to the semiochemicals induced by larval *C. fraxinella*. High release rate lures at sites throughout Edmonton in 2015 released methyl salicylate and 3-Z hexenyl acetate (a common green leaf volatile) to evaluate the response of the parasitoid community to two naturally induced semiochemicals. The first and second generation of parasitoid wasp capture was non-significant as a group indicating a similarity in response of *C. fraxinella*'s parasitoid community. A similar community response increases the value of using semiochemicals

as they will broadly attract parasitoid wasps that will decrease the population of *C. fraxinella*. Furthermore, high release rate lures are shown to have a negative effect on the overall attraction of parasitoids in comparison to lower release rates.

### **OPTIMIZATION OF A MULTIPLE-SPECIES SLAVE WORKFORCE BASED ON DIFFERENCES IN HOST MICROHABITAT OPTIMA, BY THE SLAVE-MAKING ANT, *TEMNOTHORAX AMERICANUS* (EMERY) (HYMENOPTERA: FORMICIDAE).**

**N.C. Novotny**, and J.F. Hare, Department of Biological Sciences, University of Manitoba, Winnipeg, Manitoba, Canada, R3T 2N2.

Slave-making ants raid nests of nearby host colonies, abscond with their brood, and raise slave workers that perform all the colony's domestic tasks. Ants, like other eusocial insects, are characterized by division of labour, including divisions of workers into sub-castes, which increases colony efficiency. In Canadian populations, *Temnothorax americanus* enslaves two host species, *Temnothorax ambiguus* and *T. longispinosus*, which can occur in the same slave-maker colony simultaneously. Workers of these host species may, in effect, act as different sub-castes, specializing in certain tasks or performing optimally in different contexts. Unenslaved *T. ambiguus* colonies are found in warm microhabitats while *T. longispinosus* colonies are prevalent in cooler microhabitats, presumably achieving optimal performance in species-typical microhabitat. Slave-makers may capitalize on species-specific optima of their host species by matching their slave workforce to the environmental conditions they experience. We acclimatized *T. americanus* colonies collected from field populations in the Halton, ON region to temperatures of 25°C and 15°C in environment chambers. We then offered scouting workers a simultaneous choice of pupae of their two host species derived from unenslaved colonies to determine if host species retrieval preference is affected by temperature. We also censused the demographic composition of the slave-maker colonies and tested for any effect of slave-maker colony composition on retrieval preference. There was no effect of temperature or existing slave-maker colony composition on pupal retrieval preference, suggesting that host-species worker pupae are retrieved without preference. Further investigation involving staged slave raids, however, are necessary to robustly test for slave workforce optimization.

**AN IMPROVED METHOD FOR REARING THE STRIPED FLEA BEETLE, *PHYLLOTRETA STRIOLATA* (COLEOPTERA: CHRYSOMELIDAE), IN THE LABORATORY.**

**T. Nagalingam**, and A.C. Costamagna, Department of Entomology, University of Manitoba, Canada, R3T 2N2.

The striped flea beetle, (*Phyllotreta striolata* (Fabricius) Coleoptera: Chrysomelidae) damages canola (*Brassica napus*, Brassicaceae) in the Canadian Prairies. Current methods developed to rear striped flea beetles in the laboratory are not efficient to maintain lab colonies over a sustained period of time. In this paper, we report two efficient methods to rear immature stages and adults of striped flea beetle in the laboratory at 24°C, 60% RH, 16:8 photoperiod. In the first method, both immature stages and adults of flea beetles were produced using Napa cabbage and canola as food sources. The number of eggs per beetle was 7 to 20 eggs depending on the insect generation, the longevity of the beetles varied between 17 to 53 days, average egg to adult period was 26 to 33 days, and the adult emergence rate from eggs were 67% to 90%. The second method was developed to produce adult beetles on canola plants. This method produced 6- to 9-fold increase in adult numbers after three generations. Developmental time from adult to adult ranged from 25 to 30 days. Our methods allowed rearing of striped flea beetles over 10 generations in the laboratory and showed that the striped flea beetles undergo several generations without hibernation in the laboratory.

**THE EFFECTS OF LIVESTOCK GRAZING ON VEGETATION AND LEPIDOPTERANS IN ENDANGERED ALVAR SITES IN MANITOBA'S INTERLAKE.**

**Jessica L. Rodgers**, Department of BioScience, Technology and Public Policy, University of Winnipeg, Winnipeg, Manitoba, Canada, R3B 2E9.

Alvar is a rare ecosystem characterized by open, flat terrain and incomplete vegetation with patches of exposed limestone. Alvars in Manitoba's Interlake support tall-grass prairie and boreal forest species that do not grow together in any other ecosystem and thus make a unique contribution to biodiversity. The dominant land uses in the Interlake region are mining and agriculture. Livestock grazing is prevalent in alvar areas with thin soils not suitable for crop agriculture. Disturbances, including grazing and removing shrubs and trees, may be necessary; however, livestock grazing may also have negative effects. Studies using bioindicator species to reflect the impacts of disturbance can signal future ecological changes, and indicate areas sensitive to disturbance. We examined the impacts of grazing on the diversity of plants, moths, and butterflies. Soils in grazed sites were significantly more compacted, and higher in nitrate and sodium than soils in ungrazed sites, while plant species richness was significantly higher in the ungrazed sites. Ungrazed sites supported a variety of shade-tolerant plant species, while the grazed sites were

associated with shade-intolerant and grazing-tolerant/unpalatable species. The butterflies appeared to be more closely associated to the presence of host plants for immature stages and flower sources for nectar while moths used plants in both alvars and surrounding forests for food resources. The best management strategy is for grazing to be maintained at a low intensity, beginning later in the season to maximize plant regeneration and butterfly access to flower resources.

### **EVALUATING THE EFFECTIVENESS OF A HABITAT CORRIDOR FOR RECONNECTING FRAGMENTED BUTTERFLY POPULATIONS.**

**Jeffrey M. Marcus**, Department of Biological Sciences, University of Manitoba, Winnipeg, MB, Canada, R3T 2N2.

Habitat corridor construction is an important conservation technique for re-establishing connections between fragmented habitats. Yet, corridor construction involves large, complicated, expensive, and potentially disruptive manipulation of the environment, while the effectiveness of habitat corridors to increase gene flow among fragmented populations is not well studied. In 2008 and 2009, a prairie habitat corridor was created in the Green River watershed of south central Kentucky, USA to protect water quality and encourage movement of native wildlife as part of the US Environmental Protection Agency Conservation Reserve Enhancement Program (CREP). In 2008, prior to the establishment of the habitat corridor, we documented the population genetic structure of 6 butterfly species (*Chlosyne nycteis*, *Cupido comyntas*, *Phoebis sennae*, *Phyciodes tharos*, *Pterourus glaucus*, and *Pterourus troilus*) from eight sites within the watershed using Randomly Amplified DNA Fingerprint (RAF) markers. These species have different habitat requirements, patterns of larval host plant use, and expected responses to corridor construction. STRUCTURE analysis of these markers subdivided each butterfly species into 2 to 8 subpopulations in the Green River watershed. By collecting data in the early stages of habitat restoration, we have established a baseline to compare with data obtained after the corridor has matured to determine the population genetic effects on previously isolated butterfly populations, and to provide information about the conservation value of habitat corridors in general. In 2018, the habitat corridor was resampled after 20-50 butterfly generations in order to evaluate the outcome of habitat corridor construction on population genetic structure and inform future conservation efforts.

### **ASSESSMENT OF OVIPOSITION BEHAVIOUR AND LARVAL MICROHABITAT LOCATION FOR POTENTIAL REINTRODUCTION OF**

## **ENDANGERED POWESHIEK SKIPPERLING (*OARISMA POWESHIEK*) IN MANITOBA.**

**Justis Henault** and Richard Westwood, Dept. of Biology, University of Winnipeg, Winnipeg, Manitoba, Canada, R3B 2E9.

The Poweshiek Skipperling (*Oarisma poweshiek*) (PS) is an endangered butterfly endemic to the tall grass prairie in North America. Historically occurring in Manitoba, Canada and in the northern mid United States, the PS is now only found in the Tall Grass Prairie Preserve (TGPP) in Manitoba and in Michigan at four small prairie fen sites. Habitat loss is the primary factor contributing to the decline of this species but biological and structural factors within PS habitat also regulate survival. Poweshiek Skipperling lay eggs in microhabitats in tall grass prairie with certain characteristics needed to provide food and shelter requirements for immature stages. Of special interest is the identity of larval host plants which are unknown in Manitoba. This information is critical to initiate a rearing program to re-introduce PS into sites where it has now disappeared. Female oviposition activities were observed to locate larvae and determine actual host plant species for PS in Manitoba. New behaviour of larvae on host plants in Manitoba is reported. This research will guide future management and reintroduction efforts for the long-term survival of PS in Manitoba, Canada.

## **INFLUENCE OF MANAGEMENT STRATEGY ON ECOLOGICAL SERVICE PROVIDING INSECTS IN THE TALL GRASS PRAIRIE ECOSYSTEM.**

**Reid Miller**, Department of Entomology, University of Manitoba, Winnipeg, Manitoba, Canada, R3T 2N2.

The tall grass prairie (TGP) ecosystem occupies less than 0.05% of its former range in Manitoba. Current management strategies designed to mimic historical disturbances include prescribed fires and cattle grazing. The effects that these strategies have on invertebrate communities that depend on TGP, along with the associated ecological functions that they provide, are insufficiently studied. For my study, the diversity and abundance of insect pollinators and decomposers will be analysed to elucidate the effects that current management policies are having on these beneficial insect guilds in the TGP ecosystem. To study the effect that fire and grazing are having on the diversity and abundance of pollinators and decomposers in a TGP ecosystem, sites were chosen representing three treatments: 1) burned, 2) grazed, and 3) no disturbance. Native bees were captured using bee bowls and blue vane traps and saprophagous beetles were captured using baited pitfall traps. The level of decomposition was measured in the three treatments by weighing dung before and after time exposed to insects in the field. Here I report on some preliminary bee and beetle abundance results, as well as landscape characteristic data.



## **RNAi-BASED STERILIZATION OF MALE QUEENSLAND FRUIT FLIES FOR SIT APPLICATIONS.**

**C. Cruz**, A. Tayler, and S. Whyard, Department of Biological Sciences, University of Manitoba, Winnipeg, Manitoba, Canada, R3T 2N2.

The Queensland fruit fly, *Bactrocera tryoni*, Australia's most important horticultural pest, has been controlled using the Sterile Insect Technique (SIT) for decades; however, the current radiation-based method of sterilization can potentially reduce the insects' ability to compete for mates. In this study, RNA interference (RNAi) techniques were used to sterilize males of *B. tryoni* without adversely affecting their fitness. Adults were injected or fed double-stranded RNAs targeting different spermatogenesis genes. Quantitative reverse-transcriptase PCR analyses confirmed a gene knockdown of 60–80% for all genes following injections; feeding produced a significant reduction in transcript levels for some targets after three days, but interestingly, two targets showed overexpression after 10 days of feeding. Despite this variation in transcript levels, all three dsRNAs negatively affected the fecundity of treated males. Mating competition assays demonstrated that dsRNA-treated males can actively compete with untreated males. These findings suggest that RNAi technology has incredible applications for SIT programmes, as an alternative species-specific sterilizing method.

## **EFFECT OF LANDSCAPE COMPLEXITY ON APHIS GLYCINES MATSUMURA (HEMIPTERA: APHIDIDAE) AND GENERALIST PREDATOR POPULATIONS IN SOYBEAN.**

**Crystal Almdal** and Alejandro C. Costamagna, Department of Entomology, University of Manitoba, Winnipeg, Manitoba, Canada, R3T 2N2.

The soybean aphid, *Aphis glycines* Matsumura (Hemiptera: Aphididae), is an invasive species and a major crop pest of soybean in North America. In Manitoba, *A. glycines* populations rarely reach outbreak levels; however, severe outbreaks have occurred, leading to widespread insecticide applications. To control future outbreaks, it is imperative we understand the factors that regulate *A. glycines*. Previous work has demonstrated *A. glycines* suppression is higher when there is a higher proportion of cereals and a lower proportion of canola in the landscape, during low aphid years in Manitoba. Our objective was to determine what proportion of crop and non-crop habitats in the landscape provide better suppression of *A. glycines* and produce larger populations of generalist predators in soybean. A predator exclusion experiment was conducted in 12 fields for a period of two weeks in July-August 2017, an outbreak year, to determine the

level of *A. glycines* pest suppression at varying landscape complexities. Weekly aphid counts were conducted on experimental plants and field plants. Generalist predators of *A. glycines* were collected by sweep net sampling. A 2 km radius from the study soybean field was mapped. Associations between landscape complexity and aphid abundance will be analyzed using linear models. Field plant counts revealed seven fields to be above the 250 aphids/plant threshold, averaging 1272 aphids per plant, and the five fields that did not reach outbreak levels during the study period averaged a total of 145 aphids per plant.

### **NUCLEASE ACTIVITY IN THE MOSQUITO GUT REDUCES EFFICIENCY OF RNA INTERFERENCE.**

**David Giesbrecht**<sup>1</sup>, Dave Boguski<sup>2</sup>, Ian Wiens<sup>1</sup>, Lisa Zhan<sup>1</sup>, Daniel Heschuk<sup>1</sup>, and Steve Whyard<sup>1</sup>, <sup>1</sup>Department of Biological Sciences, University of Manitoba, Winnipeg, Manitoba, Canada, R3T 2N2; <sup>2</sup>Fisheries and Oceans Canada, Winnipeg, Manitoba, Canada, R3T 2N6.

Sterile insect technique against pest mosquitoes may become a cost-effective control method with the implementation of RNA interference (RNAi) methods for sterilization. Before this goal can be realized, delivery of double stranded RNA (dsRNA) needs to be optimized. A major barrier to RNAi success in insects is degradation of dsRNA by endogenous nucleases. We report results of recent experiments that implicate two putative dsRNA nucleases in the gut of *Aedes aegypti* larvae and suggest methods of preventing degradation of dsRNA fed to mosquitoes. BLAST searches were used to identify 10 putative nuclease genes in *Ae. aegypti*. Two of these genes were selected for further investigation based on their expression in the larval gut. Nuclease knockdown experiments were conducted by feeding mosquito larvae *E. coli* expressing dsRNA against nuclease genes and a fluorescent reporter gene. After 5 days, fluorescence and mRNA of the reporter gene was measured. Nuclease activity in dissected guts was measured following dsRNA feeding by exposing dsRNA to dissected mosquito guts in PBS. We found that RNAi efficiency was improved when dsRNA against nuclease genes was co-delivered with a dsRNA against a reporter gene, and that nuclease activity *ex vivo* was reduced when nuclease genes were knocked down by RNAi. These results suggest that knocking down nuclease genes could improve dsRNA stability, enabling implementation of RNAi-based sterile insect technique. Finally, we discuss other approaches of dsRNA packaging and design for delivery to mosquitoes.

### **WHAT DRIVES THE SPATIAL DISTRIBUTION OF MOSQUITOES? MARK-RECAPTURE EXPERIMENTS AND LANDSCAPE-LEVEL MODELING IN WINNIPEG, MANITOBA.**

**M. E. Balcaen** and A. R. Westwood, Department of Biology, University of Winnipeg, Winnipeg, Manitoba, Canada, R3B 2E9.

Geographic Information Systems (GIS) models are being increasingly used as tools to target adult mosquito populations more efficiently in vector control applications to benefit public health and well-being. These models exploit the proximity relationship between mosquito populations and landscape-level or climatic variables to predict their future distributions. However, most of these models overlook the role of the dispersal capabilities of mosquitoes in determining where populations will aggregate. As these patterns of dispersal and aggregation are understudied and site-specific, we assessed these in Winnipeg (Manitoba, Canada) across several mark-release-recapture experiments. Wild adults were reared in the field, marked with ultraviolet fluorescent dusts and recaptured in unbaited light traps placed within 30 km of the release site and into the adjacent urban area. Dispersal data obtained from these experiments revealed that certain landscape features related to water and vegetation are important drivers of the spatial distribution of adult mosquito populations, with sex- and species-specific effects. Using landscape-level variables and local mosquito light trap surveillance data spanning a period of over 25 years, GIS models were also developed to predict the spatial distribution of adult mosquitoes in the Winnipeg area. Corroboration of the findings from the mark-release-recapture experiments and the GIS models are discussed within the context of local nuisance mosquito control operations and global integrated mosquito management.

### **PROTECTION OF dsRNA DEGRADATION FROM GUT-SPECIFIC NUCLEASES TO ENHANCE RNAI EFFICACY IN THE QUEENSLAND FRUIT FLY (*BACTROCERA TRYONI*).**

**A. Tayler**, D. Heschuk, D. Giesbrecht, C. Cruz, and S. Whyard, Department of Biological Sciences, University of Manitoba, Winnipeg, Manitoba, Canada, R3T 2N2.

The Queensland fruit fly (Q-fly), *Bactrocera tryoni* (Diptera: Tephritidae) is a crop pest insect endemic to eastern Australia, and the wide range of host plants it infests and its impacts on crop production and exportation makes it the most economically important horticultural pest species in the region. One of the preferred pest management strategies to control Q-flies is the Sterile Insect Technique (SIT), which has been implemented since the 1960s. Currently, the SIT programme releases large numbers of radiation-sterilized adult insects to compete with wild females for mates, ultimately resulting in a reduction of offspring produced. RNA interference (RNAi) has been proposed as an alternative method to radiation during the sterilization process, as it eliminates radiation's adverse effects on the insect's physiology and mating competitiveness. Some challenges with RNAi efficacy in various species have been recognized, primarily with oral delivery of the double-stranded RNAs (dsRNAs) used in this technology, as nucleases in the gut can degrade the dsRNA. Two gut-specific nucleases were identified in *B. tryoni* and exposure

of dsRNA to gut homogenates resulted in rapid degradation of the nucleic acids. RNAi-mediated knockdown of the nucleases as well as liposome-mediated dsRNA delivery resulted in protection of dsRNA against degradation in gut homogenates as well as vastly improved the efficiency of RNAi-mediated knockdown of other genes. These findings show that dsRNA degradation by gut nucleases reduces RNAi efficacy, and by minimizing their degradative capacity during oral delivery, RNAi effectiveness could be improved in many insect control technologies, including SIT.

### **ROLE OF THE SOUTHERN RED-BACKED VOLE, *MYODES GAPPERI*, IN THE ENZOONOTIC MAINTENANCE OF LYME DISEASE IN NORTHEASTERN NORTH DAKOTA.**

**Michael W. Dougherty**<sup>1,3</sup>, Nathan M. Russart<sup>1,4</sup>, Robert A. Gaultney<sup>2,5</sup>, Catherine A. Brissette<sup>2</sup>, and Jefferson A. Vaughan<sup>1</sup>, <sup>1</sup>Department of Biology, University of North Dakota, Grand Forks, North Dakota, USA; <sup>2</sup>Department of Basic Sciences, North Dakota School of Medicine and Health Sciences, University of North Dakota, Grand Forks, North Dakota, USA, 58202-9037; <sup>3</sup>Current address: Department of Medicine, University of Florida College of Medicine, University of Florida, Gainesville, Florida, USA, 32610; <sup>4</sup>Current address: Batelle Memorial Institute, Columbus, Ohio, USA, 43201; <sup>5</sup>Current address: Institut Pasteur, 75015 Paris, France.

North Dakota represents the westernmost range of Lyme disease and its tick vector, *Ixodes scapularis*, within the central United States. To investigate the ecology of *Ix. scapularis* in this region, 207 small mammals were live-trapped in two forested tracts in northeastern North Dakota during 2012 and 2013. *Peromyscus* sp. mice (57%) and southern red-backed voles, *Myodes gapperi* (38%) were the dominant rodent species at both sites. Overall, larval *Ix. scapularis* ectoparasitism was significantly higher on *Peromyscus* (81%, averaging 3.7 larvae per infested mouse) than on *M. gapperi* (47%, averaging 2.6 larvae per infested vole). To determine the reservoir competence of *M. gapperi* for *B. burgdorferi*, wild-caught voles were bred in the laboratory and F1 voles were injected with *B. burgdorferi* spirochetes. Pathogen-free *Ix. scapularis* larvae were fed on the voles at 10, 20, and 40 days after spirochete infection. Experimentally-infected voles infected 56%, 75% and 64% of the larval ticks fed on them at days 10, 20, and 40, respectively. Nymphs infected as larvae from voles successfully transmitted spirochetes to 13 of 18 (72%) mice. These values are similar to values reported in the literature for experimentally-infected *Peromyscus leucopus*. Thus, data from both laboratory and field indicate that *M. gapperi* contributes to the enzootic maintenance of Lyme disease in northeast North Dakota, USA. Since reservoir competence of *M. gapperi* and *Peromyscus* for *B. burgdorferi* are equivalent, the vole's role in maintaining Lyme disease depends largely on the degree to which larval *Ix. scapularis* ticks parasitize voles in nature.

## **ANTHROPOGENIC LANDSCAPE EFFECTS ON WILD BEE DIVERSITY IN SOUTHERN MANITOBA.**

**Emily J. Hanuschuk**, Department of Entomology, University of Manitoba, Winnipeg, Manitoba, Canada, R3T 2N2.

Wild bee diversity and the effects of anthropogenic change on bee communities remains poorly understood in southern Manitoba. I compared species richness, abundance, and diversity of wild bees between disturbed and semi-natural landscapes across southern Manitoba. Sixteen paired sites with high and low levels of anthropogenic disturbance were sampled for bees from May to August, 2018. Bees were collected using blue vane traps, coloured bee bowls, and aerial nets. Only specimens from net collections have been processed so far. Preliminary results with a focus on *Bombus* species and genus-level patterns will be presented. This study is being conducted in collaboration with Agriculture and Agri-Food Canada (AAFC) as part of a larger ongoing study on native pollinator potential in Manitoba.

## **LANDSCAPE STRUCTURE EFFECTS ON THE ABUNDANCE OF CEREAL LEAF BEETLE *OULEMA MELANOPUS* L. (COLEOPTERA: CHRYSOMELIDAE), AND ITS PARASITOID *TETRASTICHUS JULIS* (WALKER) (HYMENOPTERA: EULOPHIDAE).**

**Arash Kheirodin**<sup>1,2</sup>, Hector Carcamo<sup>2</sup>, and Alejandro Costamagna<sup>1</sup>, <sup>1</sup>Department of Entomology, University of Manitoba, Winnipeg, Manitoba, Canada, R3T 2N2; <sup>2</sup>Agriculture and Agri-Food Canada, Lethbridge Research Centre, Lethbridge, Alberta, Canada, T1J 4B1.

The cereal leaf beetle (CLB), *Oulema melanopus* L. (Coleoptera: Chrysomelidae), is an invasive pest of cereal crops currently expanding its range in the Canadian Prairies. This study was conducted in southern Alberta to determine landscape complexity effects on the abundance of CLB, and the parasitism levels by *Tetrastichus julis* (Walker) (Hymenoptera: Eulophidae). The abundance and percentage parasitism of cereal leaf beetle were assessed in 35 (14 spring and 21 winter wheat fields) and 41 (16 spring and 25 winter wheat fields), from May 10 to July 30, in 2014 and 2015. Landscapes represented a gradient of complexity from simple (less than 20% of non-crop areas) to complex (more than 70% of non-crop areas). The major non-crop habitats were pasture, grassy and wooded areas. The main cropland covers were cereals, canola, and potato. The average percentage parasitism was 55% and 34.59 % in 2014 and 2015, respectively. The average cereal leaf beetle abundance was 25 and 6 individuals per 50 sweeps in 2014 and 2015, respectively. Higher proportion of CLB major hosts (wheat and barley) had a positive association with CLB density and its parasitism at multiple scales (500 to 2000 m). The proportion of cereals in the previous year was also positively associated with

CLB density, suggesting that CLB hibernation adjacent to these fields plays an important role on the levels observed in the current year.

### **IMPACT OF ROLE OF LIVESTOCK GRAZING ON DIPTERA IN ICELAND.**

**Connor Watson-Savage**<sup>1</sup>, Tatiana Rossolimo<sup>2</sup>, and Isabel Barrio<sup>3</sup>, <sup>1</sup>University of Winnipeg, Department of Biology, Manitoba, Canada, R3T 2N2; <sup>2</sup>Dalhousie University, Nova Scotia, Canada, B3H 4R2<sup>3</sup>; University of Iceland, Reykjavík, Iceland.

This study focused on the effects of excluding livestock grazers on the insect communities from two habitats, gravel desert (*melur*) and dwarf heathlands, within the long-pastoralized highlands of Central Iceland. Order Diptera - the Flies - was used as a proxy for entomofauna communities, as they represent a broad taxonomic group which occupy many of the ecological niches available to local insects. Specimens were collected over two weeks in the summer of 2016 from pitfall traps placed in recently-erected plots, either with sheep fenced in with the traps, or in plots that excluded them. Over 1572 individual dipterans were collected from plots and identified to family, genus, and/or species-level. Species richness and abundance values for each plot were collected and diversity analyses were calculated for each treatment. Diversity and abundance were greater in fenced plots within the *melur*, but more variable in the highland sites when compared to grazed plots. The results indicated the possibility of significant and rapid effects on the diversity and abundance of at least some of Diptera between the two treatments, and provide reasonable grounds to warrant more in-depth research into the detrimental effects of sheep-grazing on Iceland's entomofauna.

## **POSTERS**

### **A FIELD TRIAL OF TWO COMMERCIAL LIVESTOCK PRODUCTS, ECTONIL® (1% FIPRONIL) AND LABIMECTIN® (1% IVERMECTIN) APPLIED TO CATTLE AS WAY TO KILL MALARIA VECTORS IN BELIZE.**

**Staci M. Dreyer**<sup>1</sup>, Donovan Leiva<sup>2</sup>, Marla Magaña<sup>2</sup>, Marie Pott<sup>2</sup>, Jonathan Kay<sup>2</sup>, Alvaro Cruz<sup>2</sup>, John P. Grieco<sup>3</sup>, Nicole L. Achee<sup>3</sup>, and Jefferson A. Vaughan<sup>1</sup>, <sup>1</sup> University of North Dakota, Grand Forks, North Dakota, USA, 58202-9037; <sup>2</sup> Belize Vector and Ecology Center, Orange Walk Town, Belize<sup>3</sup>; University of Notre Dame, South Bend, Indiana, USA, 46556.

Eradicating residual malaria in Central America will require novel tactics. We tested whether two commercially-available veterinary products, Ectonil® pour-on and Labimectin® injectable – normally used to treat cattle for worms and ticks – could also

kill *Anopheles albimanus* mosquitoes, a major malaria vector in Belize. Mosquitoes were collected from a rural village in northwestern Belize. Six heifers (Brahma + Brown Swiss mix, @ 800 pounds) were used. To conduct mosquito feeding safely, heifers were restrained in a squeeze chute with head gate. Two screen-top cages, each containing 20 to 40 mosquitoes, were secured onto shaved areas by plastic wrap. Mosquitoes were given 15 minutes to feed, after which cages were removed and the heifer was released. Fed mosquitoes were maintained for four days. Daily mortality was recorded. Surviving mosquitoes were dissected and ovaries scored for egg development. A total of 1,078 *A. albimanus* were tested. During the first week following treatment, significantly more mosquitoes died after feeding on Ectonil<sup>®</sup>- and Labimectin<sup>®</sup>-treated heifers versus untreated heifers. Mosquito death occurred rapidly in mosquitoes fed on Ectonil<sup>®</sup>-treated heifers, whereas death occurred more slowly in mosquitoes fed on the Labimectin<sup>®</sup>-treated heifers. By two weeks, the ability of drug-treated cattle to kill mosquitoes had declined. However, throughout the entire two-week trial period, both treatments significantly reduced egg development in mosquitoes fed on treated versus untreated heifers. Treating cattle with Ectonil<sup>®</sup> (1% fipronil) or Labimectin<sup>®</sup> (1% ivermectin) shows promise as a viable tactic to reduce populations of malaria vector mosquitoes in Belize.

#### **MINING BEES OF MINNESOTA (ANDRENIDAE: *ANDRENA*): CHECKLIST, KEY TO SUBGENERA, AND FUTURE DIRECTIONS.**

**Joel Gardner**, Department of Entomology, University of Manitoba, Winnipeg, Manitoba, Canada, R3T 2N2.

*Andrena* is one of the most diverse and abundant wild bee groups, especially in early spring, and usually makes up a large fraction of individuals in collections. High-quality keys to species exist, but are challenging to use, especially without a reliable reference collection, because of the large number of subgenera and species involved. Over the course of bee identification work at the University of Minnesota, I began to create a regional key to subgenera and accumulate reference photographs of diagnostic characters. A checklist of species is also provided. The purpose of this work is to simplify accurate subgenus-level identification within the state of Minnesota for a wide audience, at which point species identification with existing keys becomes much easier. Future work will expand the regional scope to include the neighboring states/provinces of Wisconsin, Michigan, and Manitoba, for which regional species checklists have been published or are being compiled. Already, the Minnesota key is accurate over much of this range.

#### **ADULT POPULATION DYNAMICS OF THE STABLE FLY (*STOMOXYS CALCITRANS*, L.) ON MANITOBA DAIRY FARMS.**

**Gina Karam** and Kateryn Rochon, Department of Entomology, University of Manitoba, Winnipeg, Manitoba, Canada, R3T 2N2.

The stable fly (*Stomoxys calcitrans* L.) is one of the most important livestock pests in North America. Fly bites are painful and host energy is diverted towards avoidance behaviours, which reduces weight gain and decreases milk yields in dairy cattle. Controlling stable fly populations has proven to be a difficult task. One generation of stable flies can complete their lifecycle in two to three weeks and they remain a severe pest for the entire duration of summer. Six Coroplast® sticky traps were deployed weekly at three dairy farms from June 17 to October 21 in 2017 (n=53,540 flies) and May 23 to October 3 in 2018 (n=42,585). Stable flies were first trapped on June 17 in 2017 and on June 6 in 2018. Population distribution was unimodal in 2017, with the highest population recorded between July 14-27, and bimodal in 2018, with peaks in July 24-August 2 and August 30-September 6. Studying seasonality provides critical information on the timing of life events linked to environmental conditions, such as migration, emergence, and reproduction. Temperature, precipitation, wind, and substrate suitability all vary throughout the course of the season, which can affect the number of stable flies that successfully emerge and reproduce in Manitoba.

**A QUANTITATIVE STUDY OF CHEWING LICE (PHTHIRAPTERA: AMBLYCERA, ISCHNOCERA) INFESTING BALD EAGLES, *HALIAEETUS LEUCOCEPHALUS* (ACCIPITRIFORMES: ACCIPITRIDAE), IN MANITOBA.**

**Christie D. Lavallée**, Terry D. Galloway, and Kateryn Rochon. Department of Entomology, University of Manitoba, Winnipeg, Manitoba, Canada, R3T 2N2.

Bald eagles (*Haliaeetus leucocephalus* (Linnaeus)) from 92 locations in Manitoba were examined for chewing lice from 1992–2017. Eagles were salvaged from rehabilitation hospitals and were examined using two methods, dry-ruffling (n = 108) and washing (n = 39). We collected 39,066 eagle lice of four genera and six species: *Colpocephalum flavescens* (De Haan), *C. napiforme* (Rudow), *C. turbinatum* (Denny) (total for all *Colpocephalum* spp. = 18,082), *Craspedorrhynchus halioti* (Osborn) (n = 49), *Degeeriella discocephalus* (Burmeister) (n = 20,912) and *Kurodaia fulvofasciata* (Piaget) (n = 23). Quantitative data were collected on all genera with the comparison of washed to dry-ruffled. Total prevalence and mean intensity for all species of lice were 70.9% and 372.06, respectively. Total prevalence for dry-ruffled birds was 63.0%, total mean intensity was 103.54. These parameters are significantly lower ( $p \leq 0.05$ ) than for washed birds, where prevalence was 92.3% with a mean intensity of 622.20 (One heavily infested bird was not included). Genera of lice in order of abundance were *Degeeriella* > *Colpocephalum* > *Craspedorrhynchus* > *Kurodaia*. No *Laemobothrion vulturis* (Fabricius) were found.



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# The Entomological Society of Manitoba 74<sup>th</sup> Annual Business Meeting

20 October 2018

Tier Building, University of Manitoba

## Attendance

|                            |                   |
|----------------------------|-------------------|
| President                  | Mahmood Iranpour  |
| President-elect            | Erica Smith       |
| Past President, Scrutineer | John Gavloski     |
| Regional Director (ESC)    | Kateryn Rochon    |
| Secretary                  | Sarah Semmler     |
| Common Names               | Jason Gibbs       |
| Member-at-large            | Jason Gibbs       |
| Endowment Fund             | Richard Westwood  |
| Scientific Program         | Robbin Lindsay    |
| Newsletter                 | Marjorie Smith    |
| Youth Encouragement        | Crystal Almdal    |
| Social Committee           | Gina Karam        |
| Scholarships and Awards    | Desiree Vanderwel |
| Fundraising                | Ian Wise          |

|                |                      |
|----------------|----------------------|
| Rosanna Punko  | Alejandro Costamagna |
| Megan Colwell  | Tharshi Nagalingam   |
| Riley LeBlanc  | Randy Gadawski       |
| Robert Lamb    | Martine Balcaen      |
| Neil Holliday  | Robert Wrigley       |
| Justis Henault | Pat MacKay           |

## Regrets

|                           |                  |
|---------------------------|------------------|
| Treasurer                 | Kathy Cano       |
| <i>Proceedings</i> Editor | Terry Galloway   |
| Webpage and Archives      | Rob Currie       |
| Newsletter                | Jordan Bannerman |

1 **Acceptance of Agenda**

*Motion:* to accept the Agenda (**Appendix A**) – Holliday/Rochon.....Carried

2 **Acceptance of the Minutes of the Last Annual Business Meeting (29 October 2016)**

*Motion:* to accept previous Minutes of the 73<sup>rd</sup> Business Meeting – Wise/Rochon .....Carried

3 **Business Arising from the Minutes**

No new business.

4 **Reports – Executive**

*Motion:* to receive the reports – Rochon/Lamb ..... Carried

**Appendix B – President**

Presented by Iranpour.

- the ESC is working to enhance communication between the regional Societies, build on the successes and recognize gaps.
- Will be meeting in Vancouver to discuss action items

**Appendix C – Treasurer’s and Finance Report**

Cano absent. Report presented by Westwood. Note that the Treasurer’s report also includes the Finance Report.

NOTE: A number of concerns regarding calculations were tabled. The attached report is the corrected document presented at the Executive Meeting on 12 Feb 2019.

- Action Item: Westwood to contact Cano about changing “deficiency” to “surplus” in Finance Report.

Holliday – (question about Social Committee report) What are the blanks?

Karam – Represent zeros

**Appendix D – Regional Director to the ESC**

Presented by Rochon – (played a video with greetings from the Director of the ESC, Patrice Bouchard, before meeting)

- The ESC has been moving forward on their goals, mission, and purpose.
- Positive response to the video report so far. Also very happy about the Bulletin including sections for each regional Society (we provided a section on the Poweshiek Skipperling captive rearing program). A good place to share successful practices.
- There is a new fund for Public Initiatives through the ESC, up to \$1000 for outreach
- Any feedback for the ESC should be directed to Rochon

Holliday – The ESC Bulletin is available to the public as well. Also, the \$1000 is a one-off at this point, perhaps only until the end of June, based on the ESC fiscal year. Looking for clarification.

Mahmood – Suggested that the ESC video from the President be shortened (limited time) and shown on first day of meeting.

Rochon – Was not aware of the length until the video was received. Could adjust future meeting schedule if too long, or request that the content be condensed.

Lindsay – Notes that he should have checked on the length of the video.

Holliday – Agreed on shorter video, and shown on day-one of AGM.

### **Appendix E – Editor of the Proceedings**

Galloway absent. Report presented by Lindsay.

### **Appendix F – Membership**

Presented by Semmler.

MacKay – The newsletter used to contain the names and contact information of the membership. Can this be shared in the next newsletter? Posted online?

Semmler – That information cannot be shared due to privacy rules. It is the same reason that bcc needs to be used for emails to membership. You have to have permission from the individual to be able to share their contact information.

Holliday – This came up for ESC as well. Someone could share the information for reasons other than Society business. ESC decided not to share membership information.

Gavloski – Could share just name and address?

Semmler – This would still require permission from each member listed. If there is someone you need to get in touch with, please send me an email. I am happy get to get their permission to share their contact information.

## **5 Reports – Committees**

### **Appendix G – Endowment Fund**

Report presented by Westwood.

- the Executive Committee should be aware that there are two GIC's coming due in 2019, and that the Endowment Fund Committee will be looking for some direction regarding instructions for reinvestment, and if they want to maintain the current investment ceiling.

- Action Item: Executive Committee to determine direction for GIC's.

### **Scientific Program (No Report Submitted)**

Presented by Lindsay.

Iranpour – Other institutions were notified about the meeting, so we had more out-of-town presence. Will continue that in the future.

Lindsay – We'll push more ads to the west. Some great meeting content out there.

Holliday – The society in Ontario is also having their meeting right now. Only about a day to get to ours. Could join us next time?

Lindsay – We also need to improve advertising to organizations in line with the ESM mission.

Gibbs – Maybe we could contact the media before the next meeting? Have people meet the ESM? Free Press? Local student newspapers?

Holliday – We did try a press release for the JAM awards. It was not picked up by media.

Wise – Need more social media presence. Not many reading the paper.

Holliday – Acknowledged Lindsay's efforts in organizing the 2018 AGM.

### **Appendix H – Newsletter**

Bannerman absent. Report presented by M. Smith.

- Bannerman will be stepping down from the Newsletter Committee to take over Web Page and Archives from Currie. M. Smith noted Bannerman's dedication to content, printing, and formatting, and thanked him for helping over the years.

- Thanked frequent contributors to the newsletter, such as Wrigley and Lawton.

- Looking for a new co-editor. It is not a large time commitment. They would need some technical knowledge and be competent with Word.

- Action Item: Search for new co-editor for the newsletter.

Iranpour – Suggested that new newsletters be sent to the Web Page Committee to be posted on the website when released.

### **Appendix I - Youth Encouragement/Public Education**

Presented by Almdal.

- Received funding (\$500) to improve the insectary for outreach. Will apply to the ESC for an additional \$200 to go towards insect facility.

Holliday – Can apply to ESC for last year’s \$1000 outreach grant

Wrigley – Asked if they had enough preserved specimens. Yes (Almdal).

E. Smith – Could put out a call for donation of items to support the outreach collection.

### **Social (No Report Submitted)**

Presented by Karam.

- No New Members Social last year. The intended speaker did not have time to attend, so it was pushed into the New Year. Goal is March-April 2019. Encouraged by the number of new student registrations at the AGM.

- Thinking of ways to increase outreach further than school-aged children. ESM open house? Joint fundraising events?

- CBC website and Facebook page could be used to advertise events.

- Would like to get a banner printed to set up at events.

- Action Item: Semmler to share banner printer information with Karam.

### **Appendix J – Scholarships and Awards**

Presented by Vanderwel.

- Thanked the judges for their work as there were very high-quality competitors.

### **Appendix K – Fundraising**

Presented by Wise.

- New potential donors should be shared with the Fundraising Committee. Include the name of the contact within the organization.

### **Appendix L – Web Page and Archives**

Currie absent. Report presented by Iranpour.

### **Appendix M – Common Names**

Presented by Gibbs.

- Send suggestions for insects requiring common names to the Common Names Committee.

6 **Appendix N – Election Results**

Presented by Gavloski.

President Elect..... Alejandro Costamagna

Member-at-large..... Tharshi Nagalingam

- First year with electronic voting. The number of ballots returned was very low.

- Not sure if the instructions were clear enough, or if including a Word file to copy and paste with votes would have been helpful.

Holliday – Reduced votes with ESC as well, only getting 30% with e-votes, a drop from 60%. People are not remembering to check.

Gavloski – We need more reminders sent and to refine the technique.

MacKay – Votes by email removed ambiguity and will change the process of destroying the ballots. Need to be deleted twice?

E. Smith – Federal employees receive a code to vote on a website that does not link their vote to their personal information. Also integrate calendar notifications for voting date.

Gavloski – Looking into using Survey Monkey for next year. Would provide anonymity.

- Action Item: Executive to review the process of e-voting to determine the best platform and practices for 2019. Investigate the use of Survey Monkey and the possibility of utilizing calendar functions to create reminder notifications.

NOTE: Gavloski reported that all ballots were deleted from all folders in the account – 8 January, 2019.

7 **New Business**

a) Vanderwel - Proposed new changes for the assessment process:

- Remove the need for a letter of reference from the Chair. Many Chairs in large departments have little knowledge of the student requesting the letter, or there is conflict of interest when Chairs have students that apply.

- Have the student supply a CV rather than filling out the application form which asks for similar content.

- Reduce the number of letters of reference to two (one from the supervisor)

- This would improve the process for referees and for those writing letters of reference

Lindsay – We could make guidelines for the letter of reference, what the referee wants to hear.

Vanderwel – Supervisor usually keeps a template for letters of reference and reviews the application requirements.

Holliday – When asking for a letter of reference from the supervisor, but the student is new, should there be a better option?

Vanderwel – The applicant must have been a student for a full year to apply.

Holliday – Supports idea of removing the letter from a Chair.

*Motion:* That the Scholarships and Awards Committee prepare amendments and present the changes to the Executive at the next meeting.

Holliday/Lamb.....Carried

b) Lindsay – High level keynotes attract broader audience for just that presentation. Just told people to pay registration rather than membership to attend. We could try half registration fee. It is a win-win, as long as the increased audience for certain presentations does not exclude ESM attendance.

Holliday – Past fee for specific speakers was \$5, but people may pay less to attend certain talks over the two days.

MacKay – Cutting registration in half would change the student rate to \$2.50. The current fee is reasonable. Maybe reduce the rate of regular members to \$20 for one day.

Wise – Usually changed it to \$10 for a specific talk. Could also time the popular talk with ease of processing – morning.

Lindsay – Could have Cano consider a fair price.

Iranpour – Yes, could be discussed at next Executive Meeting.

M. Smith – Is it time to raise the meeting registration fee? It has been \$20 for 20 years.

Gibbs – Willing to spend more, but where does it go? Would need to have a plan for the extra dollars.

Costamagna – This year was odd because of the surplus funds from the ESC JAM. Had trouble finding the money to afford speakers in past years.

Holliday – Could call it an “attendance fee” rather than a registration fee.

- Action Item: Executive to create a plan for the use of surplus funds in the account.

- Action Item: Executive to consider day rate for AGM registration.



c) Semmler – Need for Social Media Committee. We have a Facebook page with three admins that are no longer ESM members. Contacted them to make me an admin for now, but would like to pass this on to a committee.

Almdal – Could use a public education angle. Posts from other labs, what’s going on. It is hard to reach teenagers so social media would help.

Holliday – Would be useful for promoting meetings.

Semmler – Tweeted about our AGM on personal account to get a retweet from ESC. Better to have an ESM account for consistent updates.

Gibbs – Asked to be an admin on Facebook page.

*Motion:* Create a Social Media Committee.

Semmler/Lindsay.....Carried

- Action Item: Semmler to add Gibbs as admin on ESM Facebook page.

Iranpour – We have an archive of photos etc.

Lamb – It would be a large amount of work to digitize it all.

Iranpour – What would be most important?

Lamb – 50 years of filing cabinets...surveys, etc...Strange paper format that makes it difficult to scan. It would have to be photographed.

E. Smith – Could use extra money to pay a company to properly digitize. Could also create quality searchable options.

Iranpour – Put it on hold until Galloway can clarify what is needed?

Holliday – Rather not wait for Galloway. Should ask him to meet with the Archives Committee to make a proposal for the Executive to move on.

*Motion:* Galloway and Archives Committee to create a digitization proposal for the Executive.

Holliday/Lindsay.....Carried

Iranpour – We have five awards for students, but no awards for volunteers in the Society. Could have an annual award, such as a Service Award.

M. Smith – As a volunteer, it is my contribution. Nothing is expected in return.

Vanderwel – May restrict award to students? Good for their resume. Something they can claim, more for the recognition than the money.

MacKay – There are service awards for longstanding contributions. Joel Gosselin received a plaque for all the hard work.

Holliday – Used to give honorary memberships as major award for service. Better as *ad hoc*, rather than annual.

Gavloski – Could be something like the Criddle Award for an employed entomologist.

Costamagna – Likes the award for students. There has been a decrease in student volunteers. Could encourage help and reward the ones that put in effort.

Almdal – Hard to get help for events. Acknowledgement could help.

Karam – Could go through the list to nominate a consistent volunteer.

Iranpour – Was thinking \$200 to \$300 dollar award.

MacKay – Could give Service Award to each Executive that steps down.

*Motion:* Create a Student Exemplary Volunteer Award of \$200 and a certificate. Iranpour/Almdal.....Carried

- Action Item: Executive to draft criteria for award and to confirm a name for the award.

8 **Moment of Silence for Deceased Members This Year**

- Walter Krivda and Sam Loschiavo.

- Action Item: Galloway and Wrigley to write article in newsletter for deceased.

9 **Transfer of Office** – Iranpour transferred role as President to E. Smith.

10 **Other Business**

No other business to discuss.

11 **Adjournment** – 3:15 p.m.

*Motion:* to adjourn the meeting - Rochon/Lindsay  
.....Carried

# APPENDICES

## APPENDIX A

ENTOMOLOGICAL SOCIETY OF MANITOBA, INC.  
**Agenda of the Entomological Society of Manitoba  
74<sup>th</sup> Annual General Meeting**

**20 October 2018**

1. Acceptance of Agenda
2. Acceptance of the Minutes of the Last Annual Meeting (21 November 2017)
3. Business Arising from the Minutes
4. Reports – Executive
  - President** – Mahmood Iranpour
  - Treasurer** – Kathy Cano
  - Regional Director to the ESC** – Kateryn Rochon
  - Editor of the Proceedings** – Terry Galloway
  - Membership** – Sarah Semmler
5. Reports – Committees
  - Endowment Fund** – Richard Westwood
  - Finance** – Kathy Cano
  - Scientific Program** – Robbin Lindsay
  - Newsletter** – Marjorie Smith/Jordan Bannerman
  - Youth Encouragement/Public Education** – Crystal Almdal
  - Social** – Gina Karam
  - Scholarship and Awards** – Desiree Vanderwel
  - Fundraising** – Ian Wise
  - Archives and Web Page** – Rob Currie
  - Common Names** – Jason Gibbs
6. Election Results – Scrutineer: John Gavloski
7. New Business
  - a. Suggested amendments to scholarship application processes
    - i. Remove the need for a letter from the Chair and have applicant provide a CV and two letters of reference.
  - b. Consider a one-day ESM AGM registration category for students
  - c. Consider the addition of a Social Media Committee

8. Moment of Silence for Deceased Members This Year
  - a. Walter Krivda: Naturalist and Educator
  - b. Sam Loschiavo: Entomologist and Community Activist
9. Transfer of Office
10. Other Business
11. Adjournment

## **APPENDIX B**

### **ENTOMOLOGICAL SOCIETY OF MANITOBA, INC. President's Report to the Annual Business Meeting October 20, 2018**

#### **Meeting of the Entomological Societies in Canada – 27 February 2018 – Teleconference**

- Objectives:
  - Discussion of current links between entomological societies in Canada
  - Enhance collaboration to increase benefits to entomological societies and entomological community in Canada
  - Build on successes of outreach/educational projects
  - Identify gaps to be addressed in future
  - Determine if there is a need for increased/different communications in the future (e.g., conference calls, face-to-face meetings).
- Minutes and 13 action items were e-mailed regarding this teleconference on 28<sup>th</sup> of May 2018.
- Next meeting was scheduled for 7-8 pm on Tuesday November 13<sup>th</sup> at the Pan Pacific Hotel, in Vancouver, BC .
- 

There were two meetings of the Executive committee of the Entomological Society of Manitoba in 2018:

#### **First Executive Meeting – April 19, 2018 – Entomology Library, University of Manitoba**

- Business arising from the minutes of previous meeting on 21 November, 2017 were discussed.
  - Putting revisions to the bylaws on the ESM website
  - Create social media committee in the future as necessary
- New business:

- Finance update
- ESM annual meeting update
- ESM election update
- Membership update (many people had not paid their membership for 2017-2018)

**Second Executive Meeting – September 4, 2018 – Entomology Library, University of Manitoba**

- Business arising from the minutes of previous meeting on April 19<sup>th</sup>, 2018 were discussed.
- New business:
  - Finance update
  - ESM election update
  - ESM annual meeting update
  - Annual Return of Information

I would like to thank the committee chairs and all those who volunteer their time to the Entomological Society of Manitoba. I would also like to thank the society for the opportunity to be President and serve the society in this way.

Mahmood Iranpour  
October 20, 2018

## **APPENDIX C**

### **ENTOMOLOGICAL SOCIETY OF MANITOBA, INC. Treasurer's Report**



### **THE ENTOMOLOGICAL SOCIETY OF MANITOBA INC.**

Financial Statements Year Ended  
August 31, 2018

Note: These Financial Statements have not been audited. The Accounts, Bank Statements and Receipts were provided by the Treasurer and were reviewed on February 2, 2019 by the past Treasurer Ian Wise. All discrepancies brought forward from the previous report October 18, 2017 have been rectified and accounted for.

Treasurer: Kathy Cano  
Date: February 12, 2019

**ENTOMOLOGICAL SOCIETY OF  
MANITOBA, INC.  
Statement of Financial Position  
August 31, 2018**

|                         | <b>2018</b>      | 2017      |
|-------------------------|------------------|-----------|
| <b>ASSETS</b>           |                  |           |
| <b>CURRENT</b>          |                  |           |
| Cash                    | \$ <b>16,011</b> | \$ 4,468  |
| <br>                    |                  |           |
| TERM DEPOSITS           | \$ <b>46,000</b> | \$ 46,000 |
| <br>                    |                  |           |
| <b>TOTAL</b>            | <b>\$ 62,011</b> | \$ 50,628 |
| <br>                    |                  |           |
| <b>LIABILITIES</b>      |                  |           |
| <b>CURRENT</b>          |                  |           |
|                         | \$ <b>NIL</b>    | \$ NIL    |
| <br>                    |                  |           |
| <b>NET ASSETS</b>       |                  |           |
| Unrestricted net assets | 16,011           | 4,468     |
| <br>                    |                  |           |
| Internally restricted   | <b>46,000</b>    | 46,000    |
| <br>                    |                  |           |
|                         | <b>\$ 62,011</b> | \$ 50,628 |

**ENTOMOLOGICAL SOCIETY OF MANITOBA INC.**  
**Revised Statement of Financial Position (February 12, 2019)**  
**August 31, 2018**

|   | 2018      | 2017    |
|---|-----------|---------|
| <b>REVENUES</b>                                   |           |         |
| Annual meeting                                    | 0         | 825     |
| Donations   | 0         | 1,450   |
| ESC   | 1,1167    | 0       |
| Interest income                                   | 925       | 908     |
| Membership fees                                   | 887       | 1,467   |
| Miscellaneous                                     | 160       | 2762    |
| Proceedings                                       | 0         | 0       |
| Youth encouragement & public education            | 400       | 0       |
|   | 13,379    | 7,412   |
| <b>EXPENDITURES</b>                               |           |         |
| Awards and scholarships                           | 1,350     | 2,450   |
| Donations   | 0         | 0       |
| General   | 151       | 38      |
| Meetings  | 0         | 0       |
| ESC   | 347       | 4,000   |
| ESM   | 147       | 2179    |
| Newsletter  | 0         | 0       |
| Proceedings                                       | 0         | 0       |
| Social committee                                  |           | 220     |
| Youth encouragement & public education            | 0         | 0       |
|   | 1,995     | 8,887   |
| EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES | \$ 11,384 | (1,475) |

Note: ESC revenue reflects profit from the ESC-ESM 2017 meeting and a portion of the GST rebate. Note this revenue also reflects the refund from the advances that were made in the 2016 (1500 for the Fairmont Hotel) and 2017 (4000) years. Note the addition of 160.00 was cash taken in from the New Member's social in 2017; cash went into the bank in the next fiscal year (2018).

There were no donations to the ESM in the 2018 fiscal year due to the ESC meeting.

## **APPENDIX D**

### **ENTOMOLOGICAL SOCIETY OF MANITOBA, INC.**

#### **Report of the ESC Regional Director**

The Entomological Society of Canada (ESC) will hold its Annual General Meeting jointly with the Entomological Society of British Columbia (ESBC) and the Entomological Society of America (ESA) in Vancouver, BC from November 11-14. The theme for this year's meeting is "Crossing Borders: Entomology in a Changing World".

Following last year's strategic planning session, the ESC has produced and released new Vision and Mission statements to define the society's purpose and goals. These can be viewed on the ESC's recently update website at [www.esc-sec.ca](http://www.esc-sec.ca).

The ESC recognized the need for better communication with the regional societies, and the Board of Directors held a teleconference in February, inviting the Presidents of all regional societies to a discussion to find ways to improve the linkages between the national and the regional societies. These meetings are expected to occur on an annual basis. One idea emerging from the discussions has already been implemented: the *Bulletin* of the ESC now prominently features a new section, "News from the regions", where ESC members can get the latest news on all regional societies. In the current issue of the *Bulletin* (volume 50, issue 3), Manitoba is well featured with an updated version of Laura Burns' original article on the Grassland Butterfly Conservation Program at the Assiniboine Park Zoo first featured in our societal newsletter.

Consider becoming a member of the national society, and don't forget to renew your membership if you are already a member. It's easier than ever! There are many exciting things in the pipeline, join and be part of it!

Kateryn Rochon

Regional Director (Manitoba), Entomological Society of Canada

## **APPENDIX E**

### **ENTOMOLOGICAL SOCIETY OF MANITOBA, INC.**

#### **Report of the *Proceedings* Editor**

Volume 73 (2017) of the *Proceedings of the Entomological Society of Manitoba* was produced exclusively in electronic format. It has been sent by the Secretary, Sarah Semmler, to all members of the ESM with electronic access and posted on the ESM website by Rob Currie. Volume 73 is 135 numbered pages in length, containing one



submitted paper on new records of solitary bees in the province (including three high quality colour figures), abstracts from the Joint Annual Meeting of the Entomological Society of Canada and the Entomological Society of Manitoba held at the Fairmont Hotel in downtown Winnipeg on 22–25 October, 2017, and the Minutes and Committee Reports from the 73<sup>rd</sup> Annual Business Meeting of the Entomological Society of Manitoba held in the Tier Building on the University of Manitoba campus on 21 November, 2017.

Scientific Notes as well as full Scientific Papers are welcome. The *Proceedings* is an excellent place to publish new distribution records and faunal lists for insects and related arthropods in Manitoba. I have pledges for manuscripts from several members to submit a variety of very interesting papers, which I hope will appear in the 2018 *Proceedings*. I even have a couple myself that may eventually see the light of day. All submitted manuscripts are peer-reviewed; all published papers are available as PDF reprints on the web. Thanks very much to Rob Currie who posts the *Proceedings* so efficiently. Issues of the *Proceedings* are fully accessible using on-line search engines. There are no page charges to authors for published manuscripts, and with our electronic format, colour images can be included in manuscripts. In theory, there are no practical limits on manuscript length. There are no formal instructions for authors, other than to adopt manuscript format in line with previously published papers. All issues of the *Proceedings* are freely available to entomologists around the world. If you have something of relevance to entomology in Manitoba, I encourage you to consider submitting it to the *Proceedings*.

Terry Galloway  
*Proceedings* Editor

## **APPENDIX F**

### **ENTOMOLOGICAL SOCIETY OF MANITOBA, INC.**

#### **Report on Membership by the Secretary**

We currently have 89 members listed. However, many of these listed members still lack a date of last renewal. Date of last renewal was not recorded prior to 2017, so there was some ambiguity about who was in good standing, and who needed to pay their renewal fees. In addition, the business meeting was at an unusual time in 2017 due to the Joint Annual Meeting of the ESC and ESM, so many members were unable to attend. That likely resulted in a reduction in renewals.

There are 52 members that have paid dues in 2017-2018. Date of last renewal is currently tracked with each payment. The current AGM will offer the opportunity to renew

memberships and update the membership list. Following this update, the list of members with outstanding dues will be clear, and each will be contacted by email.

Please continue to encourage students and colleagues to join the ESM. Do not hesitate to contact me if you are unsure of your last renewal.

Sarah Semmler  
Secretary

## **APPENDIX G**

### **ENTOMOLOGICAL SOCIETY OF MANITOBA, INC. Report of the Endowment Fund Board for 2017-2018**

A summary of investments and projected interest income for the fiscal year is attached (Table 1). Interest generated by the Endowment Fund provides a basis for funding the Society activities. The Endowment Fund principal is \$46,000. There were no transactions during the fiscal year in the Endowment Fund.

Richard Westwood  
Kathy Cano, Treasurer

**Endowment Fund Guaranteed Investment Certificates**

**Table 1:** Account information as of October 10, 2018.

| <b>Certificate No.</b> | <b>Principal</b>   | <b>Interest Rate (%)</b> | <b>Maturity Date<br/>(Purchase Date)</b> | <b>Annual Interest</b> |
|------------------------|--------------------|--------------------------|--|------------------------|
| 900055611-0016         | 9,000.00           | 2.10                     | Dec 12, 2019<br>(Dec 12 2012)            | 189.00                 |
| 900055611-0017         | 9,000.00           | 2.00                     | Nov 17, 2019<br>(Nov 17, 2014)           | 180.00                 |
| 900055611-0018         | 9,000.00           | 2.00                     | Nov 19, 2020<br>(Nov 19, 2015)           | 180.00                 |
| 900055611-0019         | 10,000.00          | 1.73                     | Dec 2, 2021<br>(Dec 2, 2016)             | 173.00                 |
| 900055611-0020         | 9,000.00           | 2.25                     | Nov 10, 2022<br>(Nov 10, 2017)           | 202.50                 |
| <b>Total</b>           | <b>\$46,000.00</b> |                          |  | <b>924.50</b>          |

## **APPENDIX H**

### **ENTOMOLOGICAL SOCIETY OF MANITOBA, INC. Report of the ESM Newsletter Committee - 2017-2018**

The Newsletter Committee produced three issues of Volume 44 of the ESM Newsletter in the past fiscal year. Issue 44.1 was published in February 2018, issue 44.2 in June and issue 44.3 in October. The issues were distributed via e-mail.

The budget of the ESM Newsletter committee is expected to be minimal in future fiscal years due to the use of e-mail to distribute issues.

Jordan Bannerman will be leaving his position as Newsletter editor effective immediately so if anyone is interested in stepping into the position they should let Marj and the executive committee know.

Thank you to those members who have contributed articles to the Newsletter. We encourage all ESM Members to contribute items of interest to the membership.

Marjorie Smith  
Jordan Bannerman  
Co-Editors, ESM Newsletter Committee

## **APPENDIX I**

### **ENTOMOLOGICAL SOCIETY OF MANITOBA, INC. Report of the Youth Encouragement and Public Education Committee - 2017-2018**

This year the Entomological Society of Manitoba participated in a total of 17 outreach events, reaching approximately 8,000 people. Events included off-campus presentations to school groups and other facilities, and visits to the Department of Entomology at the University of Manitoba. Science Rendezvous, in collaboration with other Departments at the University of Manitoba, attracted a lot of public attention, allowing us to reach a wide age range of children, students, and adults.

| <b>Date</b>                 | <b>Presenter(s)</b>  | <b>Event</b>   | <b>Audience</b> |
|-----------------------------|--|--|-----------------|
| 19.xii.2017                 | Denice Geverink, Crystal Almdal                              | Department/Museum Tour   | 1               |
| 10.ii.2018                  | Lavanya Ganesan, Rosanna Punko, Crystal Almdal               | Science and Engineering Girls Club   | 34              |
| 20.iv.2018                  | -  | Specimens donated  |                 |
| 22.iv.2018                  | Derek Micholson  | Fort Whyte Outdoor Market  | 100             |
| 26.iv.2018                  | Lavanya Ganesan, Crystal Almdal                              | English Ukrainian Bilingual Programme  | 50              |
| 27.iv.2018                  | Reid Miller  | “Soil Insects” at Fort Whyte   | 46              |
| 4.v.2018                    | Leah Irwin, Denice Geverink, Crystal Almdal                  | School Event for Science Rendezvous  | ~500            |
| 7.v.2018                    | Denice Geverink, Crystal Almdal                              | HS Paul School   | 90              |
| 12.vi.2018                  | Leah Irwin, Denice Geverink, Emily Hanuschuk, Crystal Almdal | Science Rendezvous Public Event  | ~7000           |
| 6.vii.2018                  | Crystal Almdal   | On the Move, Inc.  | 65              |
| 14, 28.vii/<br>11.viii.2018 | Joel Gardner   | Manitoba Bumble Bee Survey   | 20              |
| 13.viii.2018                | Kina Karam, Lavanya Ganesan                                  | YMCA/YWCA  | 35              |
| 23.viii.2018                | Lavanya Ganesan  | King’s Park Child Care   | 25              |
| Summer,<br>2018             | Derek Micholson  | Fort Whyte Bee Hive Demonstration/Presentation to Youth  | 15              |
| 20.ix.2018                  | Martin Balcaen   | Provided information on mosquitoes for background information for a book on the mosquito statue in Komarno, Manitoba |                 |
|                             |  | <b>Total Outreach</b>  | <b>7,981</b>    |

## **APPENDIX J**

### **ENTOMOLOGICAL SOCIETY OF MANITOBA, INC.**

#### **Report of the ESM Student Awards and ESM Scholarship Committee**

The student competition at the 74<sup>th</sup> Annual Meeting of the ESM was judged by Rob Currie (Chair), Megan Colwell, and Bob Wriggle. The quality of the presentations was very high, making it a difficult decision for the judges. This year's winners are Gina Karam (Department of Entomology, University of Manitoba) for the poster competition, and Martine Balcaen (Department of Biology, University of Winnipeg) for the oral presentation competition.

Students also applied for the three scholarships and awards offered by the ESM: the ESM Student Achievement Award, the Orkin Student Award, and the ESM Graduate Student Scholarship. The committee deciding these awards was comprised of Jeffrey Marcus, Taz Stuart, and Désirée Vanderwel (Chair).

**ESM Student Achievement Award:** Awarded to a student who is in a Bachelor's degree program or recently completed a 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 Entomological Society of Manitoba Student Achievement award is Leah Irwin (University of Manitoba), who will soon graduate with a B.Sc. in Biological Sciences, with a concentration in Evolution & Diversity and a minor in Entomology. Leah is an academically gifted student, and was one of the top students in every Entomology course in which she enrolled. She also has extensive Entomology-related work experience and, to date, she has worked as a research assistant for all but one member of the Department of Entomology at the University of Manitoba! Leah is broadly interested in Entomology, and has a special skill and passion for insect collection and curation and has used her talents to make important contributions to the curation and maintenance of the J.B. Wallis-R.E. Roughley Museum of Entomology.

**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.

This year's winner of the Orkin award is Nolan Novotny (University of Manitoba), who is working towards a B.Sc. degree in Biological Sciences with a concentration in Ecology & Environmental Biology, and a minor in Entomology. According to Nolan, he decided that he wanted to "be an Entomologist and get a Ph.D. because insects are cool!" Nolan is well on the way to achieving the goals of his young self. He is a superb student, with top marks and excellent writing skills. He is currently completing his undergraduate honours thesis under the supervision of Dr. Hare in the Department of Biological Sciences, studying slave-workforce optimization in slave-making ants. Nolan plans to pursue his M.Sc. with Dr. Hare, continuing his research on slave-making ants. Then he plans to pursue his Ph.D., then become a post-doctoral fellow, and then finally become a professor and establish his own research program and "teach to share knowledge and inspire future entomologists and biologists". We wish Nolan all the best with his future plans: he is certainly off to a good start!

**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.

The 2018 Scholarship winner is Megan Colwell (Department of Entomology, University of Manitoba). Megan has been enrolled as a Ph.D. student with the Department of Entomology at the University of Manitoba since 2014, and is supervised by Dr. Rob Currie (University of Manitoba) and Dr. Steve PernaI (Agriculture Canada). Megan earned her M.Sc. (Biology) in 2014, and her B.Sc. (Honours, Biology) in 2010, both from Acadia University. Megan's research focusses on identifying the effects of wax-borne viruses on bees, and developing economical methods to reduce their impact. Megan has co-authored two papers in high-impact journals, and two technical reports. Her referees indicate that Megan is "not only a great scientist, but also a tremendously gifted communicator". She has recently presented her work to beekeepers and at local, national, and international scientific meetings, and was the recipient of the Canadian Association of Professional Apiculturists Student Award of Merit for her contributions to bee research and service to the industry.

Many thanks to the Judges, Committee Members, and Referees for their help.

Désirée Vanderwel, Chair, October 18, 2018.

## **APPENDIX K**

### **ENTOMOLOGICAL SOCIETY OF MANITOBA, INC. Report of the Fundraising Committee, 2018**

Requests for donations to the AGM were sent to the 12 sponsors who financially contributed to the 2016 AGM. Three new sponsors were included this year. Donation requests by mail were sent in the second week of September, and, as of October 18, 2018, four donations have been received. A follow-up by email will be made next month to those sponsors who have not responded.

## **APPENDIX L**

### **ENTOMOLOGICAL SOCIETY OF MANITOBA, INC. Entomological Society of Manitoba Web Site/Archivist Report, 2018**

The Entomological Society of Manitoba operates a website that is currently hosted through the public access portion of Paul Field's personal University of Manitoba web page. The website contains information about the Society and its committees, dates of meetings, programs for meetings, and provides links to other sources of entomological resources on the web. The ESM site is currently kept up to date with regular updates of newsletters, proceedings, reprints of papers from the proceedings and announcements for the annual general meeting.

In the past year the duties of the Webmaster and Archivist were merged as much of the archival material is now in digital form and posted on the Web Site. The archivist committee listing now directs individuals to the website committee; committee guidelines for the website committee now reflect the archivist component. In regards to digital archival material copies of all issues of the Proceedings of the Entomological Society of Manitoba and the former journal the "Manitoba Entomologist", newsletters dating back as far as 1999 and the historical publication of the ESC, "Entomologists of Manitoba" can now be found on the website. Other archival material relevant to the Society is maintained in a filing cabinet in a room located within 008 in the Animal Science/Entomology basement.

Jordan Bannerman has expressed an interest in taking over the role of webmaster and updating the site to make it more accessible by mobile devices and other improvements such as an updated logo. Any suggestions for additions or changes to the website should be forwarded to Rob Currie, Dept. of Entomology, University of Manitoba (rob\_currie@UManitoba.ca) or to Jordan if he is appointed Webmaster by the new executive.

Rob Currie, ESM Webmaster and Archivist



## APPENDIX M

### ENTOMOLOGICAL SOCIETY OF MANITOBA, INC. Report of the Common Names of Insects Committee, 2018

#### 1) Common names proposed and accepted by ESC

Special thanks to John Gavloski for suggesting species for common names.

Latin name: *Anisota manitobensis* McDunnough, 1921

Order and family: Lepidoptera, Saturniidae

English name: Manitoba oakworm moth

French name: Anisote de chêne du Manitoba

Reason for suggestion: This species is currently being ranked by COSEWIC. Its known range is largely restricted to Manitoba and neighbouring states (Henne 2002).

Additional notes: Manitoba oakworm moth is commonly used for this species in English.

Henne, D.C. 2002. Distribution and biology of *Anisota manitobensis* in southern Manitoba. Journal of the Lepidopterists Society 56(1): 5-8.

Latin name: *Striacosta albicosta* Smith, 1888

Order and family: Lepidoptera, Noctuidae

English name: western bean cutworm

French name: ver-gris occidental des haricots

Reason for suggestion: This species is native to the US Great Plains, but has been introduced to the Great Lakes Region including Ontario where it was first found in 2008 (Smith *et al.* 2018). It is a pest of beans, but also corn. It is an emerging pest in Canada for these crops.

Additional notes: The ESA common name is: western bean cutworm. The same common name has been used in extension publications in Ontario (Baute *et al.* 2018).

Baute, T., J. Smith, and A. Schaafsma (2018) Western bean cutworm: Scouting and management in field corn. Ontario Ministry of Agriculture, Food & Rural Affairs.

Smith J.L., T.S. Baute, M.M. Sebright, A.W. Schaafsma, and C.D. Difonzo (2018)

Establishment of *Striacosta albicosta* (Lepidoptera: Noctuidae) as a primary pest of corn in the Great Lakes Region. Journal of Economic Entomology. Doi: 10.1093/jee/toy138

Latin name: *Harmonia axyridis* (Pallas, 1773)

Order and family: Coleoptera, Coccinellidae

Suggested English name: multicoloured Asian lady beetle

Suggested French name: Coccinelle asiatique

Reason for suggestion: This exotic species is becoming more prevalent in Canada. It was recently a hot news topic in Manitoba as it began to actively invade homes. In houses, it is a common nuisance pest in the winter months. There is often concern in the public about bites from this beetle. In the summer, it is often thought of as a beneficial insect in crop

systems and is often included in studies of crop predators. Its presence in North America may be linked to declines of native coccinellid beetles.

Additional notes: The ESA common name is: multicolored Asian lady beetle [sic]. A quick Google Scholar search for '*Harmonia axyridis*' returned over 1000 results since 2017.

## **2) Common names proposed**

I reported on this species last year, but couldn't find evidence of correspondence with ESC so I re-requested it.

Latin name: *Drosophila suzukii* (Matsumura, 1931)

Order and family: Diptera, Drosophilidae

Suggested English name: spotted-wing drosophila

Suggested French name: moucheron asiatique, drosophile japonaise ou drosophile à ailes tachetées

Reason for suggestion: *Drosophila suzukii* is a serious pest of small fruit crops, including, but not limited to cherries, strawberries, raspberries, and blueberries. It was introduced from Asia and has rapidly spread across North America. This species is the focus of a great deal of active research in both North America and Europe (where it is also introduced) due to its severe economic impact. The distinctive wing spots of the male are the basis of the common name, which is often abbreviated to 'SWD'.

Additional notes. Spotted-wing drosophila is also the official common name used by the Entomological Society of America. A Google Scholar search for '*Drosophila suzukii*' resulted in >660 results in 2018 alone. 580 records for the same time period used spotted-wing drosophila (hyphenated or not).

Jason Gibbs, Chair

# **APPENDIX N**

## **ENTOMOLOGICAL SOCIETY OF MANITOBA, INC.**

### **Election Report**

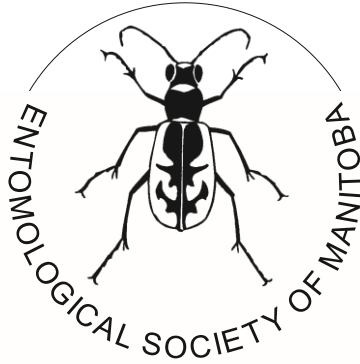
Elections closed October 1, 2018 for the Entomological Society of Manitoba offices of President-Elect and Member-at-Large. There were 88 ballots issued, 24 ballots returned, and no spoiled ballots. This was the first year using an electronic voting process.

The successful candidate for President-Elect is **Alejandro Costamagna**.

The successful candidate for Member-at-Large is **Tharshi Nagalingam**.

We thank all candidates for their willingness to participate in the election. Formal announcement and commencement of terms will be at and after the ESM Annual Business Meeting, respectively.

John Gavloski, Chair  
Scrutineer Committee



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