80TH ANNUAL MEETING

Parasitic Life: Behind the Feathers, Fur and Setae

1 November 2024
Smartpark Innovation Hub (Room MPR 2), 100 Innovation Drive, University of Manitoba, Winnipeg, Manitoba, Canada

2 November 2024
Department of Entomology (Room 219)
12 Dafoe Road, University of Manitoba

1 NOVEMBER

8:30 Parking, registration, refreshments

9:00 Welcome
Justis Henault and Vince Hervet, Scientific Chairs

9:05 Greetings from ESM President
Vince Hervet

9:10 Greetings from ESC President
Vince Hervet on behalf of Christine Noronha

Keynote address
Chair: Justis Henault

9:15 HIDDEN BIODIVERSITY: THE FASCINATING LIFE OF PARASITIC LICE THAT INFEST BIRDS (SOMETIMES YOU HAVE TO RUFFLE A FEW FEATHERS). **Dr. Terry D. Galloway**; Department of Entomology, University of Manitoba, Winnipeg, Manitoba

10:15 Refreshment break and Poster session

Posters

EXPLORING THE INFLUENCE OF 4,8-DIMETHYLDECANAL PHEROMONE ON THE MOVEMENT OF *TRIBOLIUM CASTANEUM* IN WHEAT FLOUR USING X-RAY MICRO- COMPUTED TOMOGRAPHY. H. Slobodian*, C. Findlay, J. Paliwal; Department of Biosystems Engineering, Price Faculty of Engineering, University of Manitoba [SC]

USING INSECT BITES ON PLASTICINE SENTINEL CATERPILLARS TO IDENTIFY INSECT PREDATORS IN AGROECOSYSTEMS. S. Morris*, C. Montemayor Aizpurua, R. Chinchín and A.C. Costamagna; Department of Entomology, University of Manitoba [SC]

Submitted papers
Chair: Jason Gibbs

10:45 VIRAL PATHOGEN SPILLOVER FROM HONEY BEES TO WILD BEES - 2024 FIELD SEASON REVIEW. K. Peters* and K. Bobiwash; Department of Entomology, University of Manitoba [SC]

11:00 FIRST RECORDS OF THE SLAVE-MAKING ANT *HARPAGOXENUS CANADENSIS* IN MANITOBA. B. Krongold; Department of Entomology, University of Manitoba [SC]

11:15 CAMERA, SET, PREDATION! SIMPLE AND FEASIBLE. C. Montemayor Aizpurua*[1], Y. Lawley[2], J. Gibbs[1], and A.C. Costamagna[1]; [1.] Department of Entomology, University of Manitoba; [2.] Department of Plant Science, University of Manitoba [SC]

11:30 PHYLOGENETIC DIVERSITY OF GRASSLAND BEES. T. Hettiarachchi; University of Manitoba [SC]

11:45 Lunch on your own

Submitted papers
Chair: Justis Henault

13:30 CONSERVATION OF WINNIPEG'S URBAN ELM POPULATION USING NEW FINDINGS TO IMPROVE DUTCH ELM DISEASE MANAGEMENT STRATEGIES. J. Ehn* and R. Westwood; Department of Environmental Studies and Sciences, University of Winnipeg

13:45 IS *CHLAENIUS CORDICOLLIS* (COLEOPTERA: CARABIDAE) A FREQUENT FLIER? N.J. Holliday; Department of Entomology, University of Manitoba

14:00 RANGE EXTENSION OF RED-TAILED LEAFHOPPER (*AFLEXIA RUBRANURA*) IN MANITOBA. J. Henault*[1], R. Foster[2], C. Neufeld[3] and S. Lee[3]; [1.] Independent Researcher, Winnipeg, Manitoba; [2.] Northern Bioscience, Thunder Bay, Ontario; [3.] Canadian Wildlife Service, Environment and Climate Change Canada, Saskatoon, Saskatchewan

14:15 CLIMATE CHANGE, AN APHID, *UROLEUCON RUDBECKIAE*, AND ITS WILDFLOWER HOST, *RUDBECKIA LACINIATA*, 1999-2023. R.J. Lamb* and P.A. MacKay; Department of Entomology, University of Manitoba

14:30 Refreshment break and Poster session

Submitted papers
Chair: Vince Hervet

15:00 THE 2024 POWESHIEK SKIPPERLING MARK-RESIGHT PROJECT AT THE MANITOBA TALL-GRASS PRAIRIE PRESERVE. J. Pound*[1], and R. Westwood[1,2]; [1.] Department of Environmental Studies and Sciences, University of Winnipeg; [2.] Department of Biology, University of Winnipeg [SC]

***** – presenting author; [SC] – Student competition participant; Please see abstracts for detailed affiliations.

Submitted papers continued

15:15 UNCOVERING FUTURE CLIMATIC SUITABILITY: CONSTRUCTING CLIMATE ENVELOPE MODELS FOR THREE ENDANGERED HESPERIIDAE SPECIES AT THEIR RANGE MARGINS IN MANITOBA, CANADA. A. Thorkelson, K. Dearborn and R. Westwood; Department of Environmental Studies and Sciences, University of Winnipeg

15:30 COMPARISON OF HABITAT STRUCTURE AND COMPOSITION ACROSS DISTURBANCE BASED MANAGEMENT REGIMES IN POWESHIEK SKIPPERLING SITES IN MANITOBA. J.M. Sánchez-Jasso[1], R. Westwood*[2] and N. Koper[3]; [1.] Natural Resources Institute, University of Manitoba; [2.] Department of Biology, University of Winnipeg; [3.] Faculty of Environment, University of Northern British Columbia, Prince George, British Columbia

Mixer

20:00 You are invited to our Mixer at Pat MacKay and Bob Lamb's home, where we will socialise and grant awards to winners of the Student Competition and the Student Achievement awards! Directions to their home are provided at the registration desk.

2 NOVEMBER

8:30 Parking, registration, refreshments

8:55 Welcome
Justis Henault and Vince Hervet, Scientific Chairs

Symposium
Chair: Vince Hervet

9:00 TINY BUT MITE-Y SYMBIONTS: AN EXPLORATION OF AVIAN FEATHER MITE ECOLOGY AND EVOLUTION. A.E. Matthews; Department of Biological Sciences, Arkansas State University, Jonesboro, Arkansas, USA; Department of Biological Sciences, University at Buffalo (SUNY), Buffalo, New York

Symposium continued

9:40 TO BITE OR NOT TO BITE: SOME THOUGHTS ON VECTOR PARASITE INTERACTIONS AND BLOOD-FEEDING BEHAVIOUR. R. Anderson; Department of Biology, University of Winnipeg

10:20 Refreshment break

10:50 THE DIVERSITY OF PARASITIC BEES IN MANITOBA. J. Gibbs; Department of Entomology, University of Manitoba.

11:30 INSECTS ON CROPS IN MANITOBA IN 2024 - AN EXTENSION UPDATE. J. Gavloski; Manitoba Agriculture, Carman, Manitoba

12:05 Adjournment
Justis Henault and Vincent Hervet

12:10 Catered lunch

Annual Business Meeting (Room 219, Entomology)
13:20 ESM Annual Business Meeting

REGISTRATION
Annual Membership Dues
Member - Regular: $25.00
Member - Student: $10.00

Conference Fees
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Member - Student: $10.00
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***** – presenting author; [SC] – Student competition participant; Please see abstracts for detailed affiliations.

Abstracts in order of presentation
(bolded – presenting author)

1 November 2024
Keynote

HIDDEN BIODIVERSITY: THE FASCINATING LIFE OF PARASITIC LICE THAT INFEST BIRDS (SOMETIMES YOU HAVE TO RUFFLE A FEW FEATHERS)

Terry D. Galloway
Department of Entomology, University of Manitoba, Winnipeg, Manitoba, R3T 2N2

There is tremendous interest in birds in Canada, of which there are more than 700 species recorded. Information about these birds comes from diverse sources, from amateur birders to professional ornithologists. However, few people appreciate the hidden diversity of parasitic lice that infest these birds, and in fact, our knowledge about the louse fauna is limited. Barely 50% of the expected known fauna infesting birds in Canada has been recorded, most of which are from only a few occurrences. Part of the reason for this is the cryptic nature of these lice, most of which are relatively small and live deep within their hosts' feathers. In addition, most people have little opportunity to see these birds up close, or to handle them, and so never appreciate the diversity of their lice. We know almost nothing about basic ecological relationships of chewing lice with their hosts, including seasonal occurrence, prevalence, intensity of infestation, geographic distribution, and impact on host fitness and well being. I want to tell you about my experiences with this mysterious group of ectoparasites, most of which spend the majority of their time outside Canada, accumulated over more than 30 years, and having examined nearly 12,000 specimens of birds, of 246 species. I plan to introduce you to some of the most bizarre species of parasitic lice, and why we need to keep our attention on even the most familiar birds, such the introduced rock pigeon.

Student Competition - Poster

EXPLORING THE INFLUENCE OF 4,8-DIMETHYLDECANAL PHEROMONE ON THE MOVEMENT OF *TRIBOLIUM CASTANEUM* IN WHEAT FLOUR USING X-RAY MICRO- COMPUTED TOMOGRAPHY

H. Slobodian*, C. Findlay, J. Paliwal
Department of Biosystems Engineering, Price Faculty of Engineering, University of Manitoba, Winnipeg, Manitoba, R3T 2N2

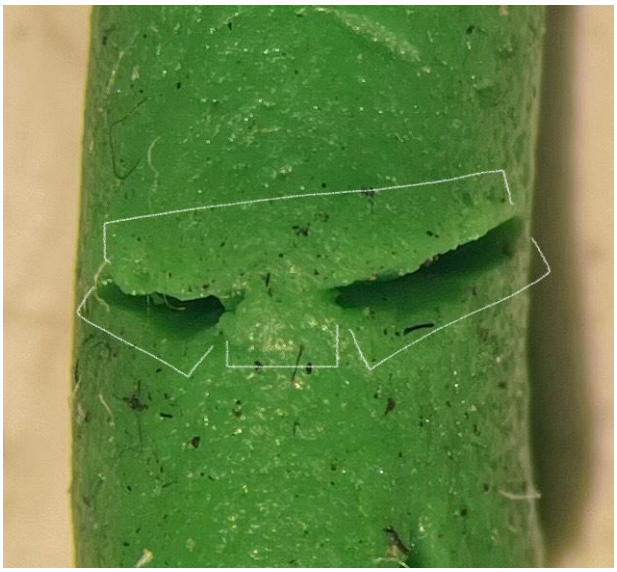
This study employs X-ray micro-computed tomography to investigate the influence of the synthetic pheromone 4,8-dimethyldecanal (4,8-DMD) on the movement patterns of *Tribolium castaneum* in wheat flour. By observing insect behavior within two compaction levels of flour (uncompacted and 30% compacted), paired with either the presence or absence of a pheromone lure, the study captures a three-dimensional view of insect movement through a flour substrate. The results highlight the influence of compaction on insect travel, with substantially greater distances traveled in uncompacted flour. While the presence of 4,8-DMD did not yield statistical significance overall, specific scenarios exhibited variations in insect movement, challenging assumptions about the universal effectiveness of these pheromones. The findings from this study provide insights for optimizing compaction levels in grain storage to impede insect movement, which is important in the design of flour mill facilities. Additionally, further research is recommended to refine pheromone formulations, considering concentrations and exposure durations, to enhance the effectiveness of pest management strategies in real-life scenarios.

Student Competition - Poster

USING INSECT BITES ON PLASTICINE SENTINEL CATERPILLARS TO IDENTIFY INSECT PREDATORS IN AGROECOSYSTEMS

S. Morris*, C. Montemayor Aizpurua, R. Chinchín and A.C. Costamagna
Department of Entomology, University of Manitoba, Winnipeg, Manitoba, R3T 2N2

Arthropod predators in agroecosystems provide important pest control ecosystem services to farmers. There are many ways of identifying the presence, identity, and impact of predators such as through the use of plasticine sentinel caterpillars. Existing research focuses on identifying bite marks on these models to general taxonomic categories such as 'mammal', 'bird', and 'arthropod'. Our research tested carabids, crickets, spiders, and a silphid to try to identify bites to more specific taxonomic levels such as family and genera. Twenty-eight carabids (Calosoma, Harpalus, Pterostichus) and five crickets showed significant results. Five spiders tested did not produce bites. Other beetles tested belonged to different taxa without enough number of replicates to include in the analyses. Measuring the lengths of the whole bite, the space between the mandible marks, and each mandible mark yielded significant differences among the four taxa compared. By considering the three measurements in tandem, it is possible to distinguish between these insects based on their bites. We also found differences between the bites on plasticine sentinel caterpillars, balls, and cylinders, indicating that different shapes can be used for different research goals. By developing a key based on the results of this experiment, scientists can identify the marks of the insects studied. Further work should be done to test more carabid genera and other arthropod natural enemies. Pairing these sentinels with pitfall traps and cameras may help guide finer identification.



Student Competition – Oral Presentation

VIRAL PATHOGEN SPILLOVER FROM HONEY BEES TO WILD BEES - 2024 FIELD SEASON REVIEW

K. Peters* and K. Bobiwash
Department of Entomology, University of Manitoba, Winnipeg, Manitoba, R3T 2N2

Bee pollination is integral for food security and ecosystem function, but these services are likely increasingly affected by stressors including habitat loss, pesticides, poor nutrition, and pathogens. Viruses are a pathogen well studied in managed honey bees (*Apis mellifera*), but in unmanaged wild bees the impact of viruses is not well understood. High honey bee mortality has been increasingly reported due to a combination of stressors, including the ectoparasitic Varroa mite (*Varroa destructor*) and the viruses it hosts. As these colony mortalities continue, wild bees may become more important in mitigating pollination deficits from honey bees. The transmission of viruses between honey bees and wild bees is not well studied, but pollen and shared floral resources are suspected to play a role. This project aims to study the pathogen spillover of viruses from honey bees to wild bees, and the role of pollen in this transmission. Across twenty field sites, honey bees, wild bees, and pollen from wild bees were collected during the summer of 2024. Sites included both agricultural canola sites and natural sites with a range of honey bee densities. Following viral analysis, samples will be used to assess viral abundances in honey bees, wild bees, and pollen. These data will be used to analyze how honey bee density and viral abundance affects wild bee diversity and viral abundance across sites, and how viruses in pollen relate to the bee that collected the pollen and the properties of the site where it was collected.

Student Competition – Oral Presentation

FIRST RECORDS OF THE SLAVE-MAKING ANT *HARPAGOXENUS CANADENSIS* IN MANITOBA

B. Krongold
Department of Entomology, University of Manitoba, Winnipeg, Manitoba, R3T 2N2

Harpagoxenus canadensis Smith is a rare socially parasitic ant species that enslaves various members of the genus Leptothorax, which are widely distributed throughout Canada. In Manitoba the species was first collected in July of 2020 from a fallen oak stick at the Birch Ski Area near Roseisle, but wasn't formally recorded at the time. On August 20th, 2024 I collected two more colonies of *H. canadensis*, also both in oak sticks at Stephenfield Provincial Park, which is around 12 kilometers north of the first locality. Due to the cryptic nesting habits and small size of this species, plus the fact that slave-making ants tend to be quite abundant in areas with a large population of their host, I suspect that *H. canadensis* may be much more common and widely distributed than previous records suggest.

Student Competition – Oral Presentation

CAMERA, SET, PREDATION! SIMPLE AND FEASIBLE

C. Montemayor Aizpurua*[1], Y. Lawley[2], J. Gibbs[1], and A.C. Costamagna[1]
[1.] Department of Entomology, University of Manitoba, Winnipeg, Manitoba, R3T 2N2; [2.] Department of Plant Science, University of Manitoba, Winnipeg, Manitoba, R3T 2N2

Predation is a vital ecosystem service that helps regulate populations across various environments. In agriculture, beneficial arthropods play a key role in pest regulation. However, assessing predation in small arthropods can be challenging due to their size. While cameras have been extensively used to study predation in large mammals, there are few studies focused on arthropod interactions, largely due to complex setups and high costs. This study evaluates the effectiveness of a solar-powered surveillance camera for monitoring ecological parameters in the field, particularly behavior and predation using plasticine caterpillars. The camera was modified with a +3.25 armless lens (glued externally), allowing clear visibility at 26 cm above the ground. It recorded continuously 20-hour sessions each week (n=4) in experimental plots (4 x 8 m) as part of a habitat pollinator project. The camera focused on seven plasticine caterpillars to collect data on predator type, activity duration, and biting attempts. After recording, the 128GB micro-SD card was analyzed in the lab. Results indicated that this affordable and easy-to-install camera could record up to 12 days in night mode. The footage facilitated the identification of common taxa, including Gryllidae (crickets) and Carabidae (ground beetles). Additionally, the duration of various activities, such as wandering, touching, and biting was measured, demonstrating that predator-prey interactions can be effectively assessed with this technology.

Student Competition – Oral Presentation

PHYLOGENETIC DIVERSITY OF GRASSLAND BEES

T. Hettiarachchi
University of Manitoba, Winnipeg, Manitoba, R3T 2N2

Grassland habitats are important because of their potential to promote carbon storage and support biodiversity. Traditional diversity indices fail to encapsulate the evolutionary history of bees. Functional approaches incorporate some behavioural and size variation, but underlying traits that are phylogenetically constrained are not accounted for. Grassland Genomics for Greenhouse Gas Mitigation (GG4GHG) is a Genome Canada funded project investigating grasslands for greenhouse gas mitigation and ecosystem provisioning biodiversity. This past summer, I conducted fieldwork across 16 sites in southern Manitoba, using passive traps (raised bee bowls) and netting techniques to capture bee-flower interactions. This combined approach helps to ensure a wide variety of species are represented and provides insights into habitat needs. Although I faced challenges like unpredictable weather and wildlife, the experience was rewarding. So far, I have collected over 2,100 bees, along with selected wasps and hoverflies, through netting. Passive trapping yielded an additional 2,000 bees and some wasps. Using a method called targeted enrichment of ultra-conserved elements (UCE), my goal is to explore the evolutionary relationships of prairie bees, which are essential for understanding biodiversity and creating effective conservation strategies. I look forward to analyzing the DNA from the bee samples to carry out a full phylogenomic study. This work will contribute valuable data for understanding pollinator diversity in prairie ecosystems and will support efforts to protect these vital species.

Submitted Paper

CONSERVATION OF WINNIPEG'S URBAN ELM POPULATION USING NEW FINDINGS TO IMPROVE DUTCH ELM DISEASE MANAGEMENT STRATEGIES

J. Ehn* and R. Westwood
Department of Environmental Studies and Sciences, University of Winnipeg, Winnipeg, Manitoba, R3B 2E9

Dutch elm disease (DED) is a deadly and ongoing threat to elm trees in Winnipeg, with losses of over 5,000 elm trees per year. The City of Winnipeg runs a DED management program to slow down the spread of disease and maintain the urban elm population. This project focused on the use of new technologies and an update of information to aid in improving current DED management strategies. The study was divided into two components. First, we tested a new method of detecting DED using a remote piloted aircraft with remote sensing technology. Second, we studied elm bark beetle activity patterns to gain updated information on species composition and larval emergence dates. The elm bark beetle study led to the observation of an invasive elm bark beetle (*Scolytus schevyrewi*) breeding in multitude in American elm (*Ulmus americana*) wood. These findings suggest the need for discussion to modify methods within the DED management program, most importantly updating the current elm pruning ban dates in Winnipeg.

Submitted Paper

IS *CHLAENIUS CORDICOLLIS* (COLEOPTERA: CARABIDAE) A FREQUENT FLIER?

N.J. Holliday
Department of Entomology, University of Manitoba, Winnipeg, Manitoba, R3T 2N2

Although some literature suggests that *Chlaenius cordicollis* flies frequently, flight in the wild was not observed in over 40 years of study of this species on the beaches of Hecla Island, Manitoba. Window traps were operated throughout the active season of *C. cordicollis* on a beach where the beetle was abundant. Seven individuals were caught, all in a 20-day period in June. Laboratory flight tests in June revealed that females fly more frequently than males and have a lower threshold temperature for flight. New-generation beetles collected in late August, some beetles were also flight-capable in laboratory tests, although to a lesser extent than those tested in June. Dissections of beetles showed that the flight period seen from window trap catches coincided with the appearance of fully developed eggs in females, and terminated before the date of maximum gravidity - a pattern consistent with the oogenesis-flight syndrome. In addition to the physiological constraints of the oogenesis-flight syndrome, flight is further constrained by temperatures below the threshold for flight. Based on 16 years of temperature records from a lakeside weather station, in 50% of years, flight is possible for females on 9 or fewer days, and for males on 5 or fewer days. Thus, in Manitoba, *C. cordicollis* cannot be considered a frequent flier.

Submitted Paper

RANGE EXTENSION OF RED-TAILED LEAFHOPPER (*AFLEXIA RUBRANURA*) IN MANITOBA

J. Henault*[1], R. Foster[2], C. Neufeld[3] and S. Lee[3]
1. Independent Researcher, Winnipeg, Manitoba, R3L 2G5; 2. Northern Bioscience, Thunder Bay, Ontario, P7A 3G3; 3. Canadian Wildlife Service, Environment and Climate Change Canada, 115 Perimeter Road, Saskatoon, Saskatchewan, S7N 0X4
Corresponding author: J. Henault (henaultjps@gmail.com)

The Red-tailed Leafhopper *(Aflexia rubranura* (DeLong 1935)) is an insect of Special Concern distinguished by black dashes on its head and a red "tail" (males) or black "V" (females) at the posterior of its abdomen. It only feeds on Prairie Dropseed (*Sporobolus heterolepis*) throughout its range in areas that can support this grass. Historical surveys for Red-tailed Leafhopper in Manitoba have found its range to generally be restricted to the Interlake region. Recent surveys have confirmed its presence at most historical sites and have located new populations, including at disjunct locations in western Manitoba. This range extension increases the known redundancy of Red-tailed leafhopper populations in Manitoba. Idle and haying disturbances regimes may be relatively supportive. Potential expansion of surveys to neighbouring jurisdictions combined with observational studies may improve our understanding of Red-tailed leafhoppers range and ecology in Manitoba.

Submitted Paper

CLIMATE CHANGE, AN APHID, *UROLEUCON RUDBECKIAE*, AND ITS WILDFLOWER HOST, *RUDBECKIA LACINIATA*, 1999-2023.

R.J. Lamb* and P.A. MacKay
Department of Entomology, University of Manitoba, Winnipeg, Manitoba, R3T 2N2
Corresponding author: R.J. Lamb (lambmack@mymts.net)

Five populations of an aphid, *Uroleucon rudbeckiae* (Fitch), and its wildflower host, *Rudbeckia laciniata* L., were assessed in southern Manitoba from 1999-2023. These populations live at the northern edge of their extensive range in the southern half of North America. Temporal trends in host plant densities and life history traits were detected, that might be attributed to climate change. From 1999-2023, the climate at four weather stations near the populations revealed no significant climate change measured as annual mean temperatures or precipitation, but monthly mean temperatures for April declined significantly by 4.1 °C and June temperatures increased significantly by 3.4 °C on average, at the four weather stations. This climate change, particularly the trend of rising temperature in June, was a cause of declining flower stem height and stem density in some plant populations but had no detectable effect on the density of the aphid populations. However, survival of aphid eggs or newly hatched juveniles was affected by declining April temperatures, with one population having little or no spring establishment on the host in the last 12 years of the study. The relative importance and repercussions of direct effects of climate change and indirect effects through the host plant on aphid populations are described.

Student Competition – Oral Presentation

THE 2024 POWESHIEK SKIPPERLING MARK-RESIGHT PROJECT AT THE MANITOBA TALL-GRASS PRAIRIE PRESERVE

J. Pound*[1], and R. Westwood[1,2]
1. Department of Environmental Studies and Sciences, University of Winnipeg, Winnipeg, Manitoba, R3B 2E9; 2. Department of Biology, University of Winnipeg, Winnipeg, Manitoba, R3B 2E9

The Manitoba Tall-Grass Prairie Preserve (MTGPP) represents one of the few remaining Tall Grass Prairie landscapes in North America, and acts as a critical habitat for a variety of threatened or endangered species, including the Poweshiek Skipperling, a small prairie-obligate butterfly. Since 2018, The Assiniboine Park Zoo has been managing a head-starting program for Poweshiek Skipperlings, raising them through their various early life stages from fall to spring, and releasing them at the MTGPP in the summer once adult butterflies emerge. These actions have successfully increased abundances in each of the remaining sites they occupy, and enabled conservation authorities to carry out a reintroduction into a formerly-occupied site last year (2023). However, it remains unclear whether butterflies are capable of dispersing between these sites, since their habitat is highly fragmented and they are relatively poor fliers. In summer 2024, I participated in a variety of Poweshiek conservation activities in the MTGPP, including surveying for wild Poweshiek individuals, conducting daily pupae checks, marking zoo-reared individuals that had eclosed, and surveying for marked individuals at various distances from release locations. We released a record high number of individuals, found at least six wild individuals at the new reintroduction site, and re-sighted marked individuals at significant distances away from release sites, indicating they might be capable of dispersing further than previously thought. Our findings are encouraging, and will help conservation authorities plan how to manage Poweshiek populations and their habitat over the coming years and decades.

Submitted Paper

UNCOVERING FUTURE CLIMATIC SUITABILITY: CONSTRUCTING CLIMATE ENVELOPE MODELS FOR THREE ENDANGERED HESPERIIDAE SPECIES AT THEIR RANGE MARGINS IN MANITOBA, CANADA

A. Thorkelson, K. Dearborn and R. Westwood
Department of Environmental Studies and Sciences, University of Winnipeg, Winnipeg, Manitoba, R3B 2E9

Poweshiek skipperling (*Oarisma poweshiek*), Dakota skipper (*Hesperia dacotae*), and Mottled duskywing (*Erynnis martialis*) are three federally listed, critically endangered butterflies found within the province of Manitoba. In recent decades each species has experienced substantial declines in both abundance and range, and there exists considerable uncertainty as to why, presenting a challenge for conservation efforts. The rapidly changing climate could be contributing to these declines, but the potential impacts of climate change have yet to be quantified and incorporated into conservation planning for the species. In an effort to bring forth such considerations we constructed ensemble climate envelope models (CEMs) for each species, using six statistically independent and biologically relevant climatic predictors. These models use associations between climate and known occurrences of a species across a landscape to infer the set of conditions under which hosting a population of that species is viable, and map it's predicted potential range change based on these requirements under climate change. Six of the most commonly used modelling algorithms were considered for analysis and included in the final ensemble based on performance. Current climate envelopes were projected to future conditions under moderate and high carbon emissions scenarios for the 2050 and 2080 periods. All three species show almost complete loss of climatic suitability under all conditions, underscoring the importance of considering climate change in long term conservation planning and reducing emissions globally.

Submitted Paper

COMPARISON OF HABITAT STRUCTURE AND COMPOSITION ACROSS DISTURBANCE BASED MANAGEMENT REGIMES IN POWESHIEK SKIPPERLING SITES IN MANITOBA

J.M. Sánchez-Jasso[1], R. Westwood*[2] and N. Koper[3]

1. Natural Resources Institute, University of Manitoba, Winnipeg, Manitoba; 2. Department of Biology, University of Winnipeg, Winnipeg, Manitoba; 3. Faculty of Environment, University of Northern British Columbia, Prince George, British Columbia

The Poweshiek skipperling, *Oarisma poweshiek,* Parker 1870 (Lepidoptera: Hesperiidae), is an endemic prairie-obligate butterfly species on the brink of extinction in the Tall-grass prairies in North America. Poweshiek skipperling is adapted to natural disturbances as wildfire, flooding, and grazing in Tall-priairies and the Canadian recovery strategy promotes disturbance-based management practices (e.g., grazing by cattle, prescribe burns, haying, and mowing) to recover and maintain populations. To enhance the recovery process for this species it is necessary to understand how management practices have shaped habitat structure and composition in remaining skipperling sites. We compared the habitat structure and composition, and plant, bird and invertebrate diversity between treatments at different temporal scales of management in occupied and formerly occupied Poweshiek skipperling sites in Manitoba. Soil variables important to larval host plant health were analyzed with significant differences found between some management regimes. Preferred adult nectar plant density was different between management types as well as plant species richness and presence of other invertebrates and birds.

2 November 2024
Symposium

TINY BUT MITE-Y SYMBIONTS: AN EXPLORATION OF AVIAN FEATHER MITE ECOLOGY AND EVOLUTION

A.E. Matthews
Department of Biological Sciences, Arkansas State University, Jonesboro, Arkansas, USA; Department of Biological Sciences, University at Buffalo (SUNY), Buffalo, New York, USA

Symbionts play fundamental ecological and evolutionary roles across multiple levels of biological organization – from individual organisms to entire ecosystems – and can have strong effects on global biodiversity. Birds, as hosts, provide multiple "niches" for a wide range of internal and external symbionts to inhabit. Among these, feathers serve as a unique avian "niche" and provide habitat for one of the most mysterious groups of avian symbionts: feather vane-dwelling mites. This presentation highlights recent discoveries on the biodiversity, (co)evolutionary history, and functional nature of vane-dwelling feather mites associated with a colorful group of avian migrants – the parulid warblers. Genomic analyses conducted at the species- and population-levels shed light on their biodiversity and population genetics, as well as uncover valuable information about their transmission dynamics and ecology. Field experiments provide novel insight into the context-dependent functional nature of the symbiotic relationship (i.e., are mites parasites, mutualists, or commensals?) and microbial surveys reveal the potential "protective" role that mites play on host feathers. By studying these tiny organisms as a model, we have been able to gain significant insights into the ecology and evolution of species interactions more broadly.

Symposium

TO BITE OR NOT TO BITE: SOME THOUGHTS ON VECTOR PARASITE INTERACTIONS AND BLOOD-FEEDING BEHAVIOUR

R. Anderson
Department of Biology, University of Winnipeg, Winnipeg, Manitoba, R3B 2E9

Paul Ewald's book, Evolution of Infectious Disease, largely set the intellectual stage for a more theory-driven consideration of the shaping forces of long-term interactions between disease-causing parasites and their hosts, with each player acting as a selective force on the other, especially given the obligate nature of such symbioses to the parasite. Janice Moore's book, Parasites and the Behavior of Animals focused on the intriguing ways in which many parasites affect the behavior of their hosts so as to increase parasite success. Transmission, a key aspect of parasite biology given the risks associated with leaving one host for another and which depends significantly on host behavior is a much-studied subject in this context. After I left the U of M Entomology Department as a newly-minted PhD, I was fortunate to post-doc with a theoretician who was interested in these questions and in addressing them with *Anopheles* mosquitoes and *Plasmodium* parasites as model organisms and in my expertise in mosquito-feeding behavior. There was a further nexus with a prominent player in the "parasite manipulation of hosts" scientific community at the time such that I was generously mentored to pursue some fascinating research. I present field and laboratory data to address the hypothesis that malaria parasites can and do affect the biting persistence of malaria mosquitoes to potentially enhance transmission.

Symposium

THE DIVERSITY OF PARASITIC BEES IN MANITOBA

J. Gibbs
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There are 95 brood parasitic bees in Manitoba in 12 genera. These comprise 24% of all bees in the province. Six evolutionary lineages are represented, which collectively invade the nests of at least 16 genera of bees in all six families occurring in Manitoba. Surprisingly little is known about host associations for many of these brood parasites. A brief summary of their diversity and associations will be provided with a focus on how more needs to be learned about these amazing bees.

Symposium

INSECTS ON CROPS IN MANITOBA IN 2024 - AN EXTENSION UPDATE

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Crop feeding insects of greatest concern in Manitoba in 2024 will be discussed. Flea beetles in canola (*Phyllotreta species*), and cutworms, in many crops, were early-season insect concerns that were quite widespread. Alfalfa weevil (*Hypera postica*) was at high levels in some alfalfa and sweet clover fields in June and early-July. Aphids got to high levels, resulting in control, in some crops, mainly peas, soybeans and to a lesser extent small grains. High levels of natural enemies of aphids were also present in some fields. Armyworms (*Mythimna unipuncta*) were a concern in cereals and forage grasses in some areas. Bertha armyworm (*Mamestra configurata*) was controlled in some canola fields in the western part of Manitoba in late-July and August. Lygus bugs (*Lygus* spp.) were controlled in some fields of canola, dry beans, faba beans and strawberries. Grasshoppers were still a concern in some areas, although not to the same extent as the previous few years. Range expansions within Manitoba were detected for cabbage seedpod weevil (*Ceutorhynchus obstrictus*) and pea leaf weevil (*Sitona lineatus*). Grape berry moth (*Paralobesia viteana*) was collected for the first time in Manitoba.