

The Entomological Society of Manitoba

Newsletter



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ABOUT THE ESM NEWSLETTER

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



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Editors' Comments



Welcome to the summer issue of the 49th edition of the newsletter! We hope you are enjoying long, warm, sunny days in the field.

In this issue, we are gearing up towards our 79th Annual Meeting of the Entomological Society of Manitoba, as well as preparing for changes coming this fall to our executive and committee teams. But this issue isn’t all business, we have great articles for you about leafhoppers, mole beetles and pyrophilic insects!

Happy reading!

Kelsey Jones & Justis Henault

ESM Newsletter Co-Editors



President's Message



I hope you are all doing well and enjoying the summer days. I know it can be a very busy time in the field or engaged in full-steam lab work. Hopefully you are also taking some time to rest and recharge before the Fall. I personally have been busy with my flies, finding joy in setting crosses, tracking the segregation of mutations and counting thousands of them under the scope. I still owe myself a trip to the field, something I used to do as an undergrad and finally tried again in the summer of 2019 to find the experience short lived due to COVID...maybe I will restart next summer.

We had our last meeting of the executive in May. You should have received an email with calls for volunteers to serve in different positions in the executive and as committee Chairs. I encourage all of you to consider applying for those roles and to be active members of our society. The main topic of our last meeting was the 2023 Annual meeting. We have an organizing committee established that have been fully engaged in discussions and making great progress in the organization of the ESM annual meeting. Thank you for your work! The meeting is going to be held on Friday October 27th and Saturday October 28th. We will have a focus on "Western" and Indigenous techniques to answer research questions, with a tentative title of *Innovation: new technologies and re-emerging ancestral knowledge*. The committee has already secured a fantastic keynote speaker so make sure you save the dates.

Also, a reminder that the 2023 Joint Annual Meeting of the Entomological Society of Canada will be held in Saskatoon, Saskatchewan from October 15-18. That's all for now, enjoy the nice weather and looking forward to see you all at the ESM meeting.

Alberto Civetta

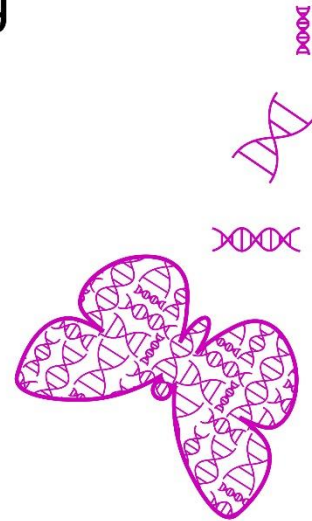
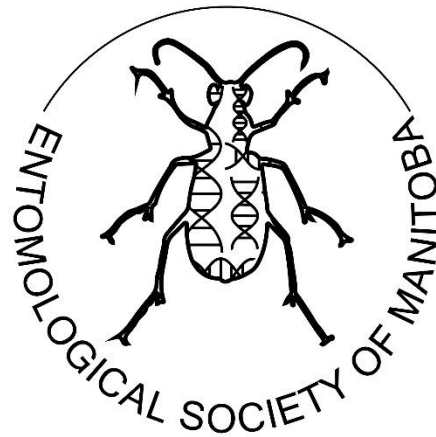
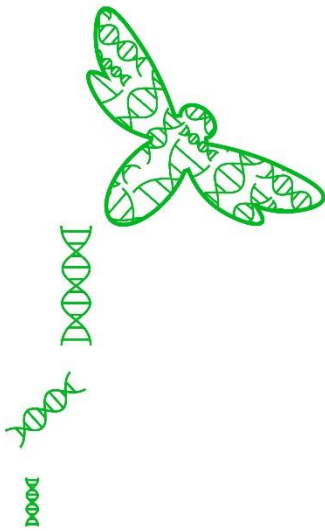
President of the Entomological Society of Manitoba



From the ESM Executive



79th Annual Meeting



*Innovations in Entomology:
New Technologies and Re-emerging Ancestral Knowledge*

27 - 28 October 2023

Please join us at our 2023 Annual Meeting! We welcome Dr. Elizabeth Clare, who will deliver the keynote address on eDNA and similar technologies in insects. We will hear both Western and Indigenous approaches to answer our research questions during our meeting.

Day 1 will occur at the SmartPark Conference Centre (100 Innovation Drive), our Mixer will return to Pat and Bob's house, and Day 2 will take place at the University of Manitoba Department of Entomology.

A call for papers, along with further details, will come in the fall.

Until then, Justis Henault (Scientific Chair) on behalf of the Scientific Program Committee.

Your Society Needs YOU!

The Entomological Society of Manitoba depends on its members to fulfill its purpose to further the spread of entomological knowledge. The Society functions thanks to the time and support of members - like you!

We are still looking for volunteers to serve in leadership roles in the ESM.

Join the Executive :

- Regional Director for the ESC: 3-year term* (elected position)
- Member-at-Large : 1-year term, renewable (elected position)
- Treasurer: 1-year term, renewable (appointed position)

Chair a committee:

- Finance Committee : 1 year, renewable
- Fundraising Committee : 1 year, renewable

* The Regional Director for the ESC will usually attend the Entomological Society of Canada meetings each year of their term.

Please consider volunteering for your Society! Contact the ESM Secretary or Past-President Kateryn Rochon to step up and get involved in **your** entomological society.



Regional Director's Message



The Entomological Society of Canada is continuing a renewal process for its Strategic Plan and considering the future direction of Joint Annual Meetings. Any members would be welcome to share their input with the Regional Director, so it can be brought to the attention of the national society.

The Joint Annual Meeting of the Entomological Societies of Canada and Saskatchewan: "Entomology in a Changing World" will be held in Saskatoon, 15-18 Oct. Early bird registration (at a significant discount) has been extended to 25 Aug 2023. Please consider attending. Deadline for submitting a paper or poster is also 25 Aug.

Meeting website: <http://entsocsask.ca/esc/esc-ess.html>

Students who have recently defended or will in 2023, are eligible to apply for the Graduate Student Showcase, which counts as an invited presentation. Submissions can be sent to: students@esc-sec.ca

Ed Becker travel awards (\$500) for students can be applied for to supplement travel costs to the JAM.

The ESC is always looking for people interested in participating further. If anyone is interested in volunteering you are welcome to contact me for information on available positions. Jason.Gibbs@umanitoba.ca

The ESC has recently put out a call for a co-Secretary. Anyone interested in serving in this position may contact either of the current Co-Secretaries, Erin Campbell (Erin.Campbell@inspection.gc.ca) or Neil Holliday (Neil.Holliday@UManitoba.CA) for further information. Erin will be continuing in her position, and Neil will be stepping down. Applications should be made to the President, Chris MacQuarrie (cjkmacquarrie@gmail.com), by 31 July 2023. The final selection will be made by an ad hoc committee convened by the President.

Jason Gibbs

Regional Director to the Entomological Society of Canada



Submitted Articles



Leafhoppers in Manitoba: More than just Crop Pests

By: John Gavloski, Entomologist, Manitoba Agriculture

Abi Benson, Summer Entomology Assistant, Manitoba Agriculture

This year we have been seeing a lot of both aster leafhopper, *Macrostelus quadrilineatus*, and potato leafhopper, *Empoasca fabae*, in Manitoba. Both of these species have many hosts. Aster leafhopper can be of concern to growers of both horticultural crops and field crops, as they vector a pathogen that results in a disease called aster yellows. Potato leafhopper is a potential pest of crops such as alfalfa, dry beans and potatoes, and can also affect fruits such as apples and raspberries.

While these two species of leafhoppers can be crop pests, there are many species of leafhoppers that are not considered crop pests, but are quite interesting and a treat to see. Here are a few that we have seen this year that, in spite of all the current concern over what aster yellows may be like this year, help us to appreciate that family of insects:

Candy-striped leafhopper (*Graphocephala coccinea*):

This leafhopper features striking red and blue horizontal bands across its forewings. The genus name *Graphocephala* means "written-on-head" which refers to the black markings that are found on the head of many of the species in the genus. *Coccinea* means "colored or dyed scarlet", referring to the red stripes that this leafhopper has.



Saddled leafhopper (*Colladonus clitellarius*):

Nymphs of this species feed on mostly herbaceous plants with dandelion being one of the nymph's favourite host plants. Adults feed and oviposit on leaves of a variety of deciduous woody plants including boxelder, mazzard, willow, lilac, wild grape, and chokecherry. They can be a vector for X-disease virus in peach and cherry. Caged adults can survive as long as 8 weeks and deposit eggs on boxelder but cannot survive longer than 10 days on dandelion. There are



two generations of this leafhopper per year. The first generation adults lay eggs in leaves. When the eggs hatch, the nymphs drop from the leaves to settle mainly on dandelion, nightshade, and prickly lettuce. The second generation adults lay eggs that fall with the leaf in which they were laid where they then overwinter (as eggs) amongst the fallen leaves. When these eggs hatch, the nymphs settle mainly on dandelion and nightshade which are amongst the few plants actively growing early in the season. The first emerging adults from each generation are mostly males.

Painted leafhopper (*Endria inimica*)

This leafhopper feeds primarily on grasses but also may be found on sweet clover. They overwinter as eggs, mainly in roadside or pasture grasses. In the field, most eggs are probably laid in decaying vegetation in or on the soil. There are two generations of this leafhopper per year. The first completes development on grasses around July 1st and disperses to spring crops while the second develops mainly on cereals then moves to



grasses. Although this species can be a vector of aster yellows, it is also the only known vector of wheat striate mosaic virus (WSMV) in North America. WSMV is not a serious problem in Manitoba, however. This is because the length of first generation is long. Since nymphs do not leave their overwintering host, the first chance for dispersal is when adults appear, which is around the time that spring crops are heading. At that point the plant is advanced and chance of a successful disease transmission is greatly reduced. They are also not very abundant. So unless another vector for WSMV occurs, or conditions occur that causes *E. inimica* to be present earlier and in larger numbers, WSMV does not appear to constitute a serious problem in Manitoba.

Silver leafhopper (*Athysanus argentarius*):

Silver leafhopper was introduced from Europe, and first recorded in North America in Massachusetts in 1920. This leafhopper also feeds on grasses. It is a very common leafhopper in Manitoba. Compared to other commonly seen leafhoppers, it is quite large with lengths of 6.5-8 mm. We can easily find it when sweeping or looking for insects in the grassy vegetation around fields. It is found mostly in ditches and rarely in fields.



Silver leafhoppers can transmit aster yellows, but it is unlikely to be important in economic crops. Although, it could be a key factor in maintaining, increasing and spreading reservoirs of aster yellows in perennial weeds.

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

The Mole Beetle, *Hypocephalus armatus* Desmarest 1832: A Featured Beetle From My Collection

By : Robert E. Wrigley and Thilina Hettiarachchi (photographer)

One of the strangest species in my collection of coleoptera is the Mole Beetle, *Hypocephalus armatus*, endemic to an extremely restricted area of northern Minas Gerais and southern Bahia in southeastern Brazil, and formerly in the State of Glaziou (Gounelle 1905). It is a rare beetle, usually ranging from 33-60 mm in length, but may reach 88 mm (Freire 2018), and is light to dark brown or black. The species is renowned for its many adaptations related to a fossorial existence. The body is exceptionally hard, fusiform, and with a greatly enlarged pronotum compared to the abdomen. The head features prominent, parallel, forward-projecting, fang-like mandibles and a pair of lower genal conical processes (larger in the male), which function in loosening and pushing soil during burrowing, and in male aggressive encounters; the head is extensively movable vertically (Svacha and Lawrence 2014). The eyes are small and the antennae, with 11 segments, have been reduced to only 6 mm in length, as befits a subterranean lifestyle. The smooth, cylindrical thorax (which reduces friction with soil) houses the substantial musculature powering the head and the well-developed legs (especially the hind, spiked femora of the male), which have been modified for digging and thrusting movements through the ground. Flight wings are absent, and the fused elytra are markedly punctate, each with six prominent costae. Svacha and Lawrence (2014) illustrate in Figure 2.1.2 (page 19) the great sexual dimorphism in this species: the female pronotum is more rounded, the abdomen relatively larger, and the hind legs are less developed than those of the male. These authors provide a thorough morphological description of the species.



Figure 1. Dorsal view of my specimen of *Hypocephalus armatus*, collected at Montezuma, State of Minas Gerais, Brazil, in November 1990, by an entomological colleague from Argentina.

For such a remarkable species (called 'Carocha' locally in Portuguese), surprisingly little is known of its biology. While females remain in their soil galleries for almost their entire lives (and hence are extremely rare in collections), males may be found on the surface hiding under debris or walking along roads and paths during the night or day in search of a sexual partner, but only during the rainy season from November to March (predominantly in December) (Sharp 1884). Gounelle (op. cit.) provided the most complete description of this species' natural history, noting that it lives in the most sterile thickets of xeric shrubland and thorn forest (transition of cerrado-caatinga), subject to severe drought, with the vegetation remaining leafless for most of the year. The sandy or clay soil of their abodes is extremely hard and consequently the females come to the surface to mate only after rains have softened the ground. In an experimental observation, Gounelle (op. cit.) described the excavating procedure as a rhythmic series of digging movements using the head as a shovel, and passing the loosened soil backwards with the legs. Adults and larvae presumably feed on roots. (Gounelle op. cit., Araujo 1954, Svacha and Lawrence 2014). Westwood (1845) believed that; "...*Hypocephalus* lives in rotten wood, upon the ground in forests." He added that two specimens were found: "...in the earth, or decaying wood, at the foot of a steep slit in the trunk of a tree." Larvae of *Hypocephalus armatus* are unknown. The website Passion Entomologique (2015) features a video of a male walking down a road in tropical scrub habitat.

Gounelle (op. cit.) described and illustrated the defense/attack pinching maneuver as the locking of an opponent by a powerful flexing of the body, and applying pressure with its sharp mandibles and spines on the legs. Some specimens have revealed penetrations of the thick exoskeleton from an opponent's mandibles.

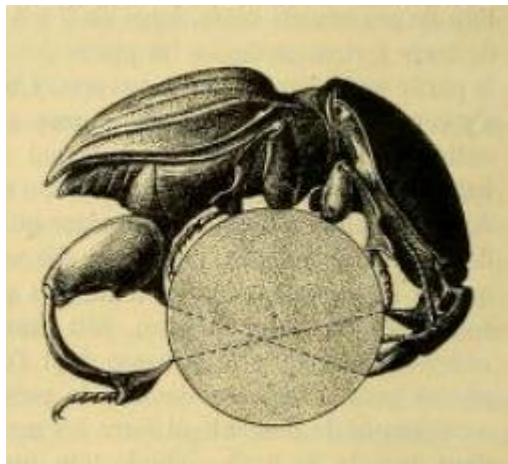


Figure 2. French naturalist Pierre-Émile Gounelle's drawing of the pinching mechanics utilized during male combat, defense, or copulation

The classification of *Hypocephalus armatus* (the only species in the genus) has been controversial since it was described by the French zoologist Eugène Desmarest in 1832. It has been referred to Xenomorphae, Prionidae, Silphidae, Cucujidae, Longicornia, Lamellicornia, Anoplodermatinae, Hypocephalidae, Cerambycidae, and most recently to Vesperidae. However, Haddad et al (2017) stated that the family Vesperidae continues to be almost impossible to define based on adult characters when it includes the Neotropical extraordinary genus *Hypocephalus*. Bousquet et al (2009) classified it as Family Cerambycidae Latreille, 1802; Subfamily Anoplodermatinae Guerin-Meneville, 1840; and Tribe Hypocephalini Blanchard, 1845. The beetle has also been the subject of many obsolete names:

Mesoclastus paradoxus Gistel, 1837; *Hypocephalus armatus* Thomson, 1857; *Hippocephalus armatus* Deyrolle, 1883; and *Hybocephalus armatus* Blackwelder, 1946. Perhaps a molecular study will provide a more-definitive answer to the beetle's true relationships.



Figure 3. Ventral view of *Hypocephalus armatus*.

Entomologists of the 1800s were greatly intrigued by *Hypocephalus armatus* when a few specimens first appeared in museums and private collections. Westwood (1845) commented that; "From the large size of the hind legs, we might first consider the insect capable of leaping, but the whole form contradicts such a notion...From the formidable appearance of the mouth organs, we might also at first consider the insect to be highly rapacious; but when we examine them in detail, we find a formation evidently unfitted for carnivorous habits... the creature cannot by any possibility bite." The head armature was first thought to be evolved for battling males, but this idea was soon revised for burrowing (Frohawk 1920).



Figure 4. Hind leg detail of *Hypocephalus armatus*.



Figure 5. Head view of *Hypocephalus armatus*.

LeConte (1876) described this remarkable beetle in great detail, concluding that; "Of all the Coleoptera known to science, there is none which has provoked more discordant expressions of opinion regarding its position and relationships than the genus *Hypocephalus*. In form, it is totally unlike any other member of the order, resembling a fat mole-cricket (*Gryllotalpa*).” In fact, the beetle and cricket provide one of Nature’s best examples of convergent evolution. LeConte concluded; "From the analysis of the characters given above, it is apparent that the thesis of Spinola is correct; and that *Hypocephalus* must be excluded from all other families of Coleoptera.”



Figure 6. Comparison of *Hypocephalus armatus* and the Tawny Mole Cricket *Neoscapteriscus vicinus* (from Gainesville Florida). While the beetle has massively developed hind legs, mole crickets, Jerusalem crickets, and cicada nymphs have fossorial forelegs for digging through soil.



Figure 7. Highly modified foreleg of the Tawny Mole Cricket *Neoscapteriscus vicinus*.

In astonishment of the beetle's appearance, Leng (1886) noted how a "subterranean career" and "the perfect operation of the processes of natural selection" could not have produced such a "monstrosity," and concluded that *Hypocephalus* is a "monument to the evil passions of the Coleoptera." In a study of arthropod subterranean adaptive strategies, Villani et al (1999) described *Hypocephalus armatus* as the most dramatically modified edaphic (soil-bound throughout life) arthropod in the world, using its hardened body and powerful legs as a wedge or bulldozer to force its way through the soil.



Figure 8. Lateral view of the head and pronotum of *Hypocephalus armatus*.

Population estimates and trends are unknown, and occurrences are few; Friere (2018) lists only 13 localities. Frohawk (1920) noted that a Senhor Lacerda accidentally uncovered three-dozen specimens, including both sexes, while trenching the ground for a plantation in Bahia, Brazil in the early 1900s, which suggests the species may become common under optimal conditions. Gounelle (op. cit.) believed this endemic species was restricted to a 50-km radius around the town of Condeúba [=Santo Antonio da Barra], Bahia State. The current suspected area of distribution is thought to be less than 20,000 km² (Freire 2018). The species is now rated as Vulnerable nationally, and Endangered in the state of Minas Gerais (Red Book of Brazilian Fauna Threatened with Extinction 2022), due to habitat degradation, fragmentation, conversion for agriculture (The

cerrado habitat is threatened by industrial-scale farming (mainly for soybeans), burning, and to over-collecting for the insect trade. Plus the beetle has little dispersal capability. Reported cultural uses of the beetle include local women tying the beetle with a ribbon to their babies' cradles for decoration, and as a toy to amuse their children (Gounelle op. cit.).

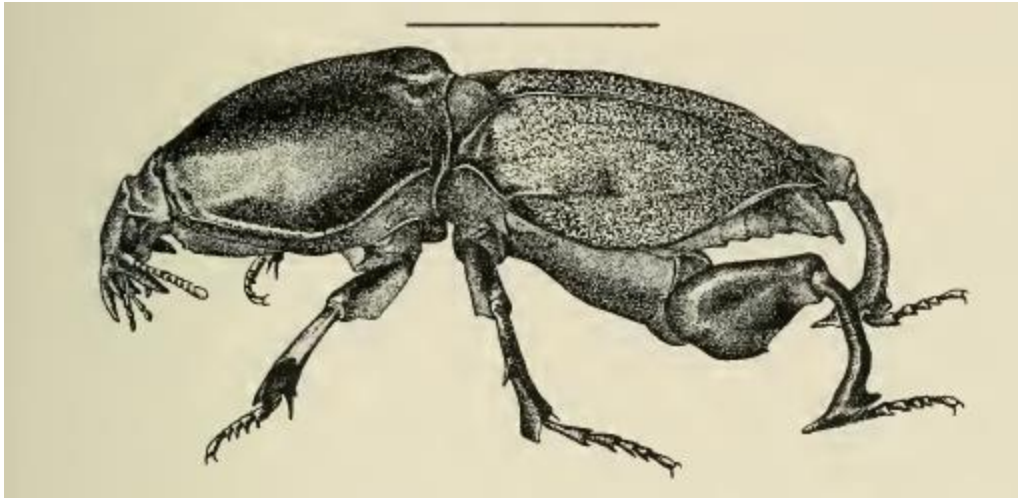


Figure 9. Drawing from Beutenmuller (1902) of the specimen that was on display at the American Museum of Natural History.

Due to this species' exotic appearance, it has been much sought after for almost two centuries by collectors and museums, with local villagers of Condeúba known in the past for providing specimens for the insect trade (Schenkling 1906). Beutenmuller (1902) described the acquisition of a rare specimen for display by the American Museum of Natural History, where it was considered; "...a remnant of a very old fauna otherwise unrepresented among living forms." Brazil understandably no longer permits the export of *Hypocephalus armatus* and its at-risk biota, but also all other insects (a renewable resource). Occasional specimens of *Hypocephalus armatus* still appear for sale on the internet, at high prices (e.g., \$80 male; \$800 female). Hopefully the future of one of the world's most-exotic insects can be secured by the establishment and stewardship of a protected area.

Acknowledgements

I thank Thilina Hettiarachchi for taking the photographs, and Arlene Dahl for a translation.

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Forged in Fire

By: Todd Lawton

Sericoda obsoleta are small, black, highly mobile ground beetles that are pyrophilic, attracted to fire. They breed in warm ash, around the bases of burned trees. Bell, 2022, found these beetles have better reproductive success if they arrive within days of a fire. Burned soil is free of pathogens, parasites and predators such as nematodes, spiders, springtails and mites that will feed on *Sericoda* eggs.

Sericoda have thermoreceptors on their antennae which allow them to navigate and reproduce in a hazardous environment: an active fire. They arrive in large numbers during and after a forest fire. Bell found that in central Saskatchewan *Sericoda obsoleta* peaked at 18 days following the fire and *Sericoda quadripunctata* at 36 days.

Knowing this, I found it confusing when I found two *Sericoda obsoleta* on a sticky trap in a Winnipeg apartment building! In February there was a fire on the fourth floor of the complex and a small area of floor tile was burned; the room smelled of smoke. A window was broken out by the firefighters and later covered with a board. There was a narrow gap, perhaps 10 mm, along the edge of the window frame to the outside air. It seems that once spring arrived a couple *Sericoda* followed the smell of smoke or other volatiles and entered the building through the gap in the window frame. While searching for the source of the fire they were caught on a sticky trap.



Aaron Bell, the author of the *Sericoda* paper I cited, and I have been in contact for a few years. He has sent me *Sericoda*, *Carabus chamissonis* and other carabids from northern Saskatchewan and I have helped him with his tiger beetle work in Manitoba and Saskatchewan. Recently we have been working together on an exciting new project investigating beetles associated with beavers and their lodges.

Todd Lawton is a Winnipeg collector who has won both the Norman Criddle and Bert and John Carr Award from The Canadian Entomological Society.

Literature Cited:

Rapid colonization of the post-burn environment improves egg survival in pyrophilic ground beetles. Bell et al., 2022, Ecosphere.

Photo: A *Sericoda obsoleta* on a sticky trap with several German cockroaches.



Updates From ESM Members



ESM Outreach Events

By Kirstyn Eckhardt

At just over halfway through the year, we have already completed 12 outreach events! In May, we taught junior high school students about climate justice and the role of insects as friends, not foes. We also presented at Shaftsbury Retirement home to a group of elderly folks who had tons of great questions. A few of them were willing to touch the Madagascar hissing cockroaches, and one person even called them cute! For National Insect Appreciation Day (NAIAD) in June, we spent the morning with the Forest School at FortWhyte. We gave the kids "scavenger hunt" sheets and explored the grounds with them, challenging them to see how many different insect groups they could find. The kids were so respectful of the insects they found, which was amazing to see!



ESM Executive & Committees



2023 Executive

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