



VES NEWS

The Newsletter of the Vermont Entomological Society

Number 111
Spring 2021



Parthenesis Lady Beetle (*Hippodamia parenthesis*)
Photo @ Kent McFarland

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The **Vermont Entomological Society** (VES) is devoted to the study, conservation, and appreciation of invertebrates. Founded in 1993, VES sponsors selected research, workshops and field trips for the public, including children. Our quarterly newsletter features developments in entomology, accounts of insect events and field trips, as well as general contributions from members or other entomologists.

VES is open to anyone interested in arthropods. Our members range from casual insect watchers to amateur and professional entomologists. We welcome members of all ages, abilities and interests.

You can join VES by sending dues of \$15 per year to:

Deb Kiel
147 Allen Irish Road
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Newsletter Schedule

Spring: Deadline April 7 - Publication May 1
Summer: Deadline July 7 - Publication August 1
Fall: Deadline October 7 - Publication November 1
Winter: Deadline January 7 - Publication February 1

Membership

Check Your Mailing Label

The upper right corner of your mailing label will inform you of the month and year your VES membership expires.

Dues are \$15 and can be sent to our Treasurer:

Vermont Entomological Society
c/o Deb Kiel
147 Allen Irish Road
Underhill, VT 05489





Dear Folks,

Welcome to Spring! Though it has started by bits and fits, I feel confident that it is pretty much here. I have already seen a couple of butterflies, collected a few moths and am looking forward to the Spring flowers.

We have been able to put together a calendar of events. For the most part the calendar covers the first part of the season and we would hope to add a couple of events later in the Summer and Fall. We already have some exciting events planned and I do hope members take advantage of these opportunities.

The Lake Raponda Field Day may become an annual event. How often do we get to wander the haunts of southern Vermont?

I would also like to thank Sean Beckett and the North Branch Nature Center for offering to host our annual meeting. Initially we had hoped to gather at the state lab in Randolph, but the North Branch site is a lot more practical, offering us plenty of outdoor space if warranted.

We have an article on the UVM ZTZC collection in this current newsletter. It has been disappointing to see the current problem of the collection not returning to its previous home. I do hope that VES members and others will participate in a letter-writing campaign expressing our dissatisfaction later in the Fall. In the meantime, consider signing on to the letter of support mentioned in the newsletter.

I look forward to seeing some folks outside this season!

Michael Sabourin
VES President



ZTZC to remain at Blundell House for Foreseeable Future

by Michael Sabourin



Last December, I received an e-mail from Vermont Entomological Society (VES) member Jim Talbot expressing his distress about the future of the Zadock Thompson Zoological Collection (ZTZC) in relation to a couple of recent events at the University of Vermont (UVM). Jim has been a weekly volunteer at the ZTZC since the collection resided at Torrey Hall. The collection was evacuated from Torrey Hall subsequent to a fire in 2017. (Baird, 2017).

“After the fire at Torrey Hall in 2017, we moved all of the insect, mollusk and mammalian collections to Blundell House on Redstone campus. In the process, the research library, specimens and equipment were quickly boxed up at Torrey, moved to Blundell, and unpacked. The botany specimens (The Pringle Herbarium), however, were retained on the main campus at Jeffords Hall. Right now, the museum at Blundell is managed by several professors, volunteers, and a recent graduate student who works part-time. This facility is inadequate for the purpose of housing museum specimens due to lack of air conditioning and proper ventilation; little security; and no sprinkler system. There is little room for expansion and we’ve had to throw out many of the older publications dealing with insects and natural history.” (Talbot, 2020)

The above account, as well as a recent proposal for eliminating programs in the UVM College of Arts and Sciences (Galloway, 2020), have put a damper on the thought of the ZTZC returning to Torrey Hall. The plan all along (we thought) had been to move back into Torrey Hall where the botanical and zoological collections could be housed again at an integrated natural history center. A floorplan design was developed by Smith-Alvarez-Sienkiewicz, Architects for Torrey Hall, that incorporated the returning collections (UVM, 2021). The vision was “Because of the fire, we now have the opportunity to re-

envision Torrey Hall as a building fit for our 21st-century museum. A team of architects is working closely with museum staff to design a fully renovated interior, including more space for collection growth, much improved access for those with disabilities, and state-of-the-art freezing facilities for better collection care. The gem of the new Torrey Hall will be a dedicated public exhibit hall where we can proudly display our collections and forge a new connection with our Vermont community. The museum is expected to reopen in 2021.” (UVM, 2021)

In a December phone call with Dr. David Barrington, Director of the Pringle Herbarium, he told me that UVM’s chief financial officer had informed him 18 months ago that the collections would not be returning to Torrey Hall as the UVM administration didn’t think the old building was suitable for them. Dr. Barrington hopes that a suitable alternative for the collections, such as a new Natural History Museum building can be developed, but believes that would mean raising an additional 5 million dollars somehow. Some museum and biology department faculty members, students, and staff have opposed UVM’s decision not to return the collections to Torrey Hall but so far their efforts have yet to bear fruit.

Issues with neglect of the ZTZC at Torrey Hall were essentially what inspired the creation of the VES in the 1990s. Back then, the VES had little impact in making improvements. However, during the past decade, the ZTZC was significantly enhanced with federal grants and active curation. (Yusseff-Vanegas, 2015.) Prior to the COVID-19 pandemic, there was a constant presence of staff, students, and volunteers at the museum. With the 2021 fall semester looming, volunteer work most likely will resume using University-mandated health and safety protocols. Museum staff and others, however, will continue to advocate for a move back to Torrey. To date, the VES has had no

formal correspondence with UVM administration regarding the ZTZC.

Since this letter was originally crafted, I received a letter by Kent McFarland (2021) of the Vermont Center for Ecostudies (VCE) that he sent to the Invertebrate Scientific Advisory Committee (ISAG) asking regional scientists and associates to distribute a letter of support for the UVM natural history collections. Please follow the link below and consider signing on:

https://docs.google.com/forms/d/e/1FAIpQLScRY4XdUUZ0wWKIyjsn61sPnL6g5nfPmJBrkUwqNURyNROy_w/viewform?usp=sf_link.

In his letter, Kent mentioned that he has “been collaborating with colleagues at UVM for years now on trying to rescue the natural history collections, which were evacuated from Torrey Hall after a fire in 2017. The 450,000 specimens in the zoological collections are in an especially bad situation, shoved into three different temporary spaces with poor conditions and no plan for their future.” He stated that the “collections have been of utmost importance for our work at the ISAG. They have allowed us to peer back in time over a century to help understand changes that may have occurred with some groups like butterflies, bumble bees, lady beetles and others. It is also a place for us to permanently store specimens from



Torrey Hall
Photo: Michael Sabourin

today for use sometime far into the future. In short, these collections are the library of Vermont's natural heritage.” Vermont is one of the only two New England states without a state collection and the resources such provides.

A recent paper by French et al, (2020) expounded on the fact that “museum curated specimens are important archives of taxonomic,

ecological, and genetic information” and “DNA is now routinely extracted from museum specimens”

To learn more about the ZTZC collection:
www.uvm.edu/vtnaturalhistory/zadock-thompson-zoological-collections

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Blundell House
Photo: Michael Sabourin



May 19, 2021 (6 p.m.): Ladybug Zoom with Julia Pupko of Vermont Center for Ecostudies. Learn about Lady Beetles and efforts to study them in Vermont. Meeting by Zoom, but pre-registration requested; contact Michel Sabourin at mothvet@yahoo.com, 802.522.7992

June 12, 2021 (11 a.m.): Lady Beetles at Virginia Stranahan Memorial Town Forest (STF). Meet at STF Hollister Hill parking lot in Marshfield, VT. (near the Hollister Hill Farm.) Look for and learn about lady beetles in their natural habitat with Julia Pupko of Vermont Center for Ecostudies. Rain date, Sunday, June 13; contact Michel Sabourin at mothvet@yahoo.com, 802.522.7992.

June 26, 2021 (10a.m.): Northfield, VT, Explore the Burnham's Cilohocla property. Meet at I-89 Exit 5 commuter parking lot. Explore a family camp with pond and hopefully discover some Showy Lady Slippers. Rain date, Sunday, June 27; contact : Doug and Mary Burnham at burnham.doug@gmail.com, 802.229.9578.

July 10 2021 (save the date): Springfield, VT, look for Odonates in forested seeps; Join with Kelly Stettner of Black River Action Team (BRAT) in looking for odonates in various localities around Springfield; more details later.

July 11, 2021 (11 a.m.): Birds of Vermont Museum, Huntington, VT : Annual butterfly and bug walk, 900 Sherman Hollow Road; contact : www.birdsofvermont.org, 802.434.2167.

July 17, 2021 (2 p.m. and 8 p.m.): Lake Raconda Field Day with Lake Raconda Association and Cambridge Entomological Club. Meet at 264 Lake Raconda Road (park along road). A unique opportunity to explore the aquatic and terrestrial invertebrates of the Lake Raconda watershed; one of the only seep lakes in Vermont. Rain date, Saturday, July 24th; more details to come.

Aug. 27, 2021(7:30 – 9:30 p.m.): Birds of VT Museum: Moth Walk led by Michael Sabourin. Max. 10 people; waitlist available.

BOVM website: <https://birdsofvermont.org/event/moth-walk-2021/>

Eventbrite: <https://www.eventbrite.com/e/moth-walk-registration-151109666079>

Free, donations welcome. If it's raining, please call the Museum (802.434.2167) to see if the walk has been rescheduled.

Sept 25, 2021 (11a.m.): Vermont Entomological Society Annual Meeting at North Branch Nature Center. Meet at North Branch Nature Center, 713 Elm St, Montpelier, VT. In addition to a potluck feel free to explore the grounds before and after; contact Michel Sabourin at mothvet@yahoo.com, 802.522.7992.

Two New Vermont Lepidoptera Species from Old Material: *Anteotricha unipunctella* and *Gonioterma mistrella* (Stenominae, Lepidoptera)

By Michael Sabourin

First report of *Gonioterma mistrella* (Busck) in Vermont: With the onset of the Covid-19 virus, one of my initial projects was cleaning up my piles of papers and other debris around the house. While cleaning up my work station, I opened a small plastic case containing a yellowish tortricid-sized lepidoptera specimen set in cotton with a hand-written note. The note merely said "Bolton VT July 2, 2008 Coll. Trish Hanson." As I had been relaxing specimens sent to me from Caddo Parish, Louisiana, I just tossed Trish's specimen in with them.

I had totally forgotten about Trish's initial inquiry and I'm sure I blew it off as being something like *Clepsis clemensiana*. How many monochrome yellowish tortricids are there? However closer and genitalic examination showed the male moth to be of oecophorid type. Going through the MONA fascicle by Hodges (1974), I was unable to locate the moth. When I expanded my search to go through the Moth Photographers (MPG) plates on the internet, I was able to discover an example of *Goniotema mistrella*.

Goniotema mistrella is known from eastern North America (MPG, iNaturalist, 2021), but records would indicate that this would be the first New England report.

First report of *Antaeotricha unipunctella* (Clemens) in Vermont.: The late and former state entomologist Gordon Nielsen passed way in 2007. The majority of his collection went to the Carnegie Museum in Pittsburg, Pennsylvania (Sabourin, 2014) and some frozen material went to McGuire Center in Florida (Russo & Gaudette, 2019). Of Gordon's material, I received several shoe-box

sized boxes of dry specimens contained in plastic petri dishes by date. The specimens are primarily non lepidoptera collected by malaise trap run by Gordon and Jane O'Neil in Essex, Vermont from 2005 to 2006. I have been relaxing those specimens over time.

I get excited when I see a petri dish with lepidoptera inside. The most I try to do when relaxing material that old is get a pin through it and maybe try to identify it if there is a compelling reason. While going through one such container, I immediately recognized an *Antaeotricha* specimen having been familiar with that genus with my work in Wisconsin.

I had collected *Anaeotricha osseella*



Gonioterma mistrella
Photo: Michael Sabourin

(Walsingham) in Wisconsin jackpine barrens in the past. However, the unique spatulate uncus of Gordon's specimen proved it to be *Antaeotricha unipunctella* (Duckworth, 1966.) *A. unipunctella* is distributed in eastern United States (MPG, 2021), but this appears to be its northern-most record.

Two New Vermont Lepidoptera Species from Old Material: Antaeotricha unipunctella and Gonioterma mistrella (Stenominae, Lepidoptera) (continued)

References:

Duckworth, W. D. 1966. North America Stenomidae (Lepidoptera: Gelechioidea), Proceedings of USNM 116: 31-32, Pl. 1c, Fig. 3, 25.

Hodges, R. W. 1974. In Dominick, R. B. et al. The Moths of North America, Fasc. 6.2, Gelechioidea: Oecophoridae (in part).

iNaturalist. 2021.

https://www.inaturalist.org/observations?taxon_id=220538 (Gonioterma mistrella).

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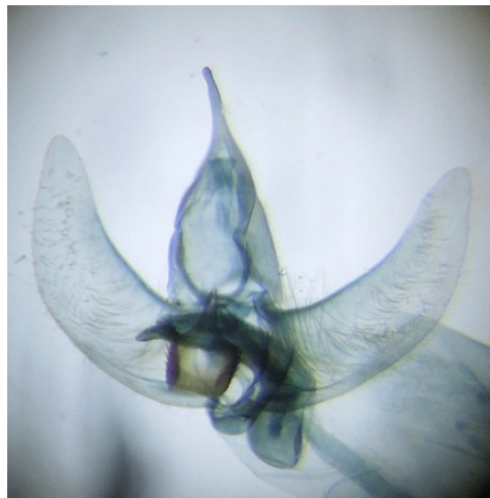
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Antaeotricha unipunctella

Photo: Michael Sabourin



Gonioterma mistrella genitalia

Photo: Michael Sabourin



Antaeotricha unipunctella genitalia

Photo: Michael Sabourin

Leafcutting Bees (Megachilidae)

By Judy Rosovsky

It is not often that an entomologist as astute as Mike Sabourin is stumped, but it does happen. Mike sent me some photos of intriguing leaf-lined pipes or tubes. I had no idea what they were, but luckily VES emerita Trish Hanson came to our rescue, with her remarkable memory and erudition, and identified them as leafcutting bee nests. Leafcutting bees are in the family Megachilidae, an interesting group that contains many colorful species and has a diverse set of nesting and provisioning behaviors. Their name has been translated as the “big-lipped” or “long tongued” bees. They are characterized by their large mandibles. The North American species collect pollen on their abdomens.

In North America, there are about 600 species in 18 genera, organized into 3 tribes and a subfamily. The family includes the well-known genus *Osmia*, or mason bees, an important pollinator species for commercial crops, in addition to the *Megachile* and others. Because this family tends to nest in twigs, it has been moved around in world trade. In the U.S. there are at least 7 introduced species in the genus *Megachile* and a total of 19 introduced species in the family Megachilidae. One of these, *Megachile rotundata*, the alfalfa leafcutter bee, can pollinate alfalfa with 15 times the productivity of the honey bee. The native *Osmia lignaria* has become an important pollinator of certain fruit crops and is more efficient than honeybees. Because of their stick-nesting propensities, some Megachilids are easy to induce to aggregate and pollinate crops. It is not clear what the ecological effects of the introduced species is on the native bees. The large introduced species *M. sculpturalis*, known as the resin bee, has been observed forcing carpenter bees to leave their nests, though native Megachilid species may evict bees from other families, too. Considered solitary bees, as they don't form colonies, *Megachile* can be gregarious

and will nest close together. Perhaps to distinguish their own doorstep from their neighbors', the females deposit a pheromone in their entryways by pressing their abdomens along the substrate as they enter. A wide range of nesting locations and substrates exist, including pre-existing and human-made cavities, twigs, rotten wood, plant pith, hollow stems, old boring-beetle holes and holes dug in the ground. Leafcutters are characterized as above-ground nesters partly because they are often surveyed using trap-nests, which would disproportionately attract above-ground nesters.



Leafcutting Bee Nests (*Megachile* sp.)

Photo : Doug Gottshall, Braintree, VT

Trap-nests are human-provided nesting sites that are attractive to these bees, such as the bee-nesting block in the photo. Examples of human substrates include holes in masonry, nail holes, plastic tubes and some remarkable crevices. Some bees in the genus *Dianthidium* construct brood cells similar to that of certain caddis flies in that they use a variety of materials to build a somewhat camouflaged nest.

Leafcutting Bees (*Megachilidae*) (continued)

Important factors for nest site choice are the building materials and food resources in the vicinity. Since the leafcutters need leaves, areas without broadleaf plants, like deserts, are less likely to harbor these bees. Most leafcutting bees use leaves for lining and even constructing the nest, but others use material like resin, gravel or mud. If leaves or petals are used, then the leaves are cut from the outer edge of the leaf inwards in a circle. The bees drop to the ground with the leaf portion, then fly to the nest with the cutting. The cigar-shaped, tubular nests can be different lengths and widths, to accommodate the size of that bee species and the hole that was found, stolen or excavated. Provisions (nectar and pollen) are brought in and the egg is laid, then the chamber is sealed off with a leaf, resin or a small pebble or other material, depending on the bee species. This continues until the tube is filled and the end is capped off with the preferred building material. Emerging adults will need to chew their way out. A cutaway photo of the galleries can be seen at <https://beediverse.com/mason-beesresin-bees-and-leafcutter-bees/>.

Most ground-nesting bees line their cells with water-repelling secretions from their Dufour's gland, a gland that is nearly universal in Hymenoptera (an order which includes ants, wasps and bees). Leafcutting bees that ground nest are one exception to this, presumably due to the use of leaves as cell liners that would exclude water. Dufour's gland secretions have anti-microbial properties, too. An interesting study on the leaves used by leafcutting bees indicated that, out of a total of 54 plant species studied, 48 species used for lining the cells of leafcutting bees had anti-microbial properties. The remaining 6 species were not native to that region. The development of lining nests may have allowed these bees to diversify over evolutionary time. Those Megachilid bees that do not line their nests, like the Megachilid tribe the Lithurgini, are a more primitive lineage that may reflect ancestral bee

behavior.

All is not rosy in the Megachilid bee world, though, as subsets of this family have evolved into cleptoparasites, especially in the genus *Coelioxys*, a.k.a. cuckoo bees. These specialized insects do not make or provision their own cells for rearing their brood. They deposit their eggs into cells that



Adult Leafcutting bee (*Megachile rotundata*) on bee-nesting block.
Photo: Whitney Crenshaw, Colorado State University, Bugwood.org
<https://creativecommons.org/licenses/by-nc/3.0/us/>

another species made and provisioned, and their young feed on the host's food. Within two years, a colony of thousands of ground-nesting bees was eliminated due to cleptoparasitism. In some cases, the parasitic adult kills or removes the host eggs and larvae, but more often she deposits her egg and leaves her larva with specially-adapted mandibles to kill the host eggs and larvae on its own. Cleptoparasites that embrace the latter strategy are called hospicidal. Next time you see your ornamental plants with large round areas removed, remember that the leafcutting bees are working hard to prepare a nice home for their progeny, and perhaps one for their hospicidal cousins, too.

Leafcutting Bees (*Megachilidae*) (continued)

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Wilson, J., & Carril, O. 2016. *The Bees in Your Backyard: A Guide to North America's Bees*. Princeton; Oxford: Princeton University Press. doi:10.2307/j.ctt15hvxqg.



Leafcutting bee (*Megachile spp.*) damage
Photo: Gerald Holmes, Strawberry Center, Cal Poly San Luis Obispo, Bugwood.org
<https://creativecommons.org/licenses/by-nc/3.0/us/>

Artificial Intelligence and Moths

By David Rolnick

Some of you might remember me as an enthusiastic kid on moth trips, before I left Vermont for college and studied math instead of moths. It's been a while since then. I spent time in Brazil (for moths) and Germany (for math) and went on to grad school, where I explored different topics before ending up in artificial intelligence.

Artificial intelligence (AI) probably sounds exciting or scary. It's arguably both, though perhaps not in the way that springs to mind. There may come a time with sentient machines, but it won't be today or tomorrow. Instead, today's artificial intelligence allows computers to do repetitive tasks much faster and slightly worse than people. That includes labeling images automatically, controlling a robot so it (usually) doesn't crash, or finding patterns in historical data to predict what the data will be tomorrow. That's still surprisingly powerful, and it's being used in ways that are both exciting (pointing out cancer in medical scans) and scary (really well-targeted internet ads).

I don't work on cancer or ads. I'm now a professor in computer science just across the

border in Montreal, and my students and I work on AI applied to climate change and biodiversity. That includes a lot of different things – optimization of electrical grids, faster computations of atmospheric physics, satellite monitoring of ecosystem health. And it also includes insects.

AI algorithms are good at labeling images, using mathematical functions called “convolutional neural networks” that can capture visual patterns. One way this can be used is in automatically identifying species of organisms from pictures. By looking at many example images – sometimes hundreds of photos of each species – the algorithm “learns” what patterns can be used to tell the different species apart. This technique has been highly successful in identifying birds and is increasingly being used for insects as well, though that is harder since (a) there are so many insect species and (b) there aren't as many example images for the algorithms to learn from, especially for rare or understudied taxa.

Automatic species identification algorithms are not as good as human experts – they are



Species (case-sensitive)	Image	Date/Location	Combo
filter data...			
Asterocampa celtis	0.77234370	0.38683462	0.83526295
Asterocampa clyton	0.18762726	0.31301525	0.16419075

An AI algorithm identifying a Hackberry Emperor Butterfly (*Asterocampa celtis*) with 83.5% confidence. Photo: David Rolnick



designed to augment entomologists, not replace them. These algorithms can help get more people interested in insects via digital apps, and can train novices to learn new species (I would definitely appreciate an AI algorithm for identifying beetles, an area where I don't have much experience). In the future, it may even be possible to have some insect monitoring be done completely automatically with camera traps that can identify the species they record.

My group at McGill University is currently developing AI tools for automatic identification of

Lepidoptera, together with the Montreal Insectarium and the eButterfly project, co-founded by Kent McFarland. We hope to soon deploy some of those algorithms to help monitor moths in Vermont. Maybe I didn't move that far away after all.

You may contact the author, David Rolnick with comments or questions at drolnick@cs.mcgill.ca.



Two Swallowtail Species, One Shared Host Plant

By Judy Welna

An unruly patch of common rue (*Ruta graveolens*) lines the west-facing foundation of our house. A native of the Balkan Peninsula, this plant is distributed elsewhere as an ornamental, with its subtle blue-green foliage and ability to thrive in poor soil as selling points. It is also deer resistant and drought tolerant. It naturalizes well, and grows with little care, but can overtake a garden, needing frequent pruning to keep it in check. Due to these dominant growing habits, we put the plant on probation as we worked to convert our gardens to native-Vermont plants. The rue would need to do something quite wonderful to earn its place - and it seems to have done just that! It is a host plant for both the Giant Swallowtail (*Papilio cresphontes*) and, increasingly, the Black Swallowtail (*Papilio polyxenes*) butterflies that live in northwestern Vermont.

In August 2012, we were thrilled to see our first Giant Swallowtail butterfly on the flowers. The following season, we found its larvae on the rue. We were puzzled at first, as several online sources stated the Giant Swallowtail's favored

host plant for this area is prickly-ash (*Zanthoxylum americanum*). To my knowledge, this plant does not grow on our property. Most, though not all, iNaturalist reports of prickly-ash in Vermont that year were along the western border of Vermont, especially in the Lake Champlain Valley. Further investigation showed that both *Ruta graveolens* and *Zanthoxylum americanum* are members of the rue family (Rutaceae). There are several host plants listed for Giant Swallowtails in various regions of North America; these are also from the Rutaceae family.

We are far more familiar with the Black Swallowtail. Beginning in the mid-1970s, I used to regularly gather a few Black Swallowtail larvae in late August-early September to raise in a second-grade classroom. I found most of the caterpillars on young Queen Anne's lace (*Daucus carota*) plants which grew along the edge of our dirt road. We watched them eat, and grow, and form their chrysalides. Their pupae would overwinter, the adults emerging around Memorial Day. My lesson plan books became unintended nature journals, with marginal notes which showed remarkable

Two Swallowtail Species, One Shared Host Plant (continued)

consistency from year to year.

By the early 2000s, there was a shift in the timing. I wasn't finding Black Swallowtail caterpillars on the expected dates, although there were plenty of adults then. The pupae, which usually spent the winter outside, instead began to open in the fall. When several adults emerged together on a warm fall day, I refrigerated the remaining pupae, removing them a few weeks before their usual time of eclosure in the spring.

In addition to natural offerings, we plant dill, parsley, fennel, and several other related plants (all members of the Apiaceae family) in an herb garden. We might find one or two Black Swallowtail caterpillars on an herb-garden plant, but once the rue was established, it became the preferred host. It was interesting to observe the Black Swallowtail select a plant from the Rutaceae family, given that its traditional hosts were in a garden just around the corner, and in the rich meadows nearby.

Each year since 2013, we've observed two broods of Giant Swallowtails. Like the Black Swallowtails, the Giant Swallowtails have also changed their schedule. It is not unusual to find caterpillars quite late into the fall. In November 2019, I watched a group of larvae feeding on *R. graveolens*, and took daily photos of one caterpillar which finally succumbed finally on Nov. 6, 2019 in the prepupal stage. There were late-season hatches of adults in fall 2019 and 2020. These events cause me to wonder where things might be headed...

Both species may be on the brink of producing a third brood. If an adult butterfly emerges in November in Vermont, there simply is not time for it to survive and reproduce. If more adults actually emerge in fall, then fewer are left to create the first generation of the next season. Are their numbers down?

What about *R. graveolens*' value as a host plant? Is it a convenient substitute only? Why



Giant Swallowtail (*Papilio cresphontes*) caterpillar
Photo: Judy Welna

would the Black Swallowtail seem to prefer this introduced plant to its traditional hosts? Does common rue offer equivalent benefits to either species? Black Swallowtails raised on wild carrot plants vs. Black Swallowtails raised on common rue. Are Florida Giants, whose Orange Dog

caterpillars feed on citrus leaves, comparable to Vermont Giants, whose larvae feed on prickly-ash or common rue? (I recall a study about various types of milkweed, some of which were not as beneficial as others for



Black Swallowtail (*Papilio polyxenes*) caterpillar
Photo: Judy Welna

Two Swallowtail Species, One Shared Host Plant (continued)

which were not as beneficial as others for Monarch butterflies.) Are some species better able to expand their menus along with their ranges?

Our provisional patch of *Ruta graveolens* has been granted room to grow here, at least for now, even if it doesn't behave. It won't be long before the Giant and Black Swallowtails float into our days again, bringing about a new round of questions, but most of all, joy.



Giant Swallowtails eclosed on Nov. 8, 2020, Georgia, VT.
Photo: Judy Welna



Giant Swallowtail larva by egg
Photo: Judy Welna



Giant Swallowtail in prepupal stage
Photo: Judy Welna

Vermont Lady Beetle Atlas

By Julia Pupko

Is your imagined lady beetle red with black spots? For years, this was the only image that came to mind when I thought about lady beetles. I had no idea how many different lady beetle species exist. The only species I was familiar with was the invasive Asian Lady Beetle (*Harmonia axyridis*) – the species that commonly congregates in people’s homes during winter. In Vermont alone, there are 42 recorded species of lady beetle (35 native and 7 introduced), and we are still discovering species that have not been previously recorded.

Lady beetles come in different sizes, colors, and shapes, ranging from just fractions of a centimeter to nearly a centimeter in length. Some are black with red spots; others are the classic red with black spots; some are orange, yellow, or brown; and some have bars instead of spots or no spots at all. These beetles can be found in all types of habitats, from fields, to forests, shrubland, and swamps, to the garden in your backyard.

Despite differences in appearance and habitat preference, many lady beetles share an important feature: they act as biological pest controls, munching down aphids, plant mites, scale insects and other soft-bodied pests. Native lady beetles have evolved alongside native pest species, and many synchronize their life cycles to align with their pest of choice. For example, both Hudsonian Ladybirds (*Mulsantina hudsonica*) and Eye-spotted Lady Beetles (*Anatis mali*) have evolved to synchronize their life cycles with that of the Balsam Twig Aphid (*Mindarus abietinus*). This means that the lady beetle larvae are growing when aphid populations are at their peak, giving the beetles an increased chance of survival. Balsam Fir trees also benefit, as the growing lady beetles reduce the pest load on the trees. Other native lady beetle species have begun to associate with invasive pests, like the Twice-stabbed Lady Beetle (*Chilocorus stigma*) and Beech Bark Scale insects, helping to reduce invasive pest loads on

infected trees.

Many native lady beetle species populations across the country are in decline. These declines are thought to be caused by the introduction of non-native lady beetle

species, such as the Asian Lady Beetle, land-use change, introduced pathogens and pesticide use. Introduced lady beetles often grow faster than native lady beetle species, outcompeting them for habitat and food, while also consuming native lady beetle larvae. This may result in pest outbreaks in the future, as some studies indicate that native lady beetle species hunt certain native pests more effectively than introduced lady beetle species, and therefore provide better pest control.



Painted Ladybird (*Mulsantina picta*)
Photo ©Kent McFarland



Spotted Lady Beetle (*Coleomegilla maculata*)
Photo ©Nathaniel Sharp

Vermont appears to be experiencing native lady beetle declines as well. Twelve of Vermont's native lady beetle species have not been seen in over 40 years. The last full survey of Vermont's lady beetle fauna was completed in 1976. We don't know if these 12 missing species have been extirpated or still exist in low numbers. We also don't know what conservation measures may be needed to support potentially-declining native lady beetle populations in Vermont. To answer these questions, the Vermont Atlas of Life team at the Vermont Center for Ecostudies started the Vermont Lady Beetle Atlas. We are calling on volunteer naturalists across the state to join us in our search, which will increase the chances of finding these beetles. During our pilot year, volunteer naturalists have already rediscovered four of Vermont's lost lady beetle species, recorded three new species, and doubled the number of research-grade, lady beetle observations uploaded to iNaturalist.

If you would like to help with our lady beetle quest, simply install the free iNaturalist app to your phone (or camera and internet-connected device of choice) and upload pictures of any lady beetle you encounter. You may also visit the Vermont Lady Beetle Atlas website to find more ways to get involved and learn more about these fascinating beetles.

References:

[iNaturalist.org](https://www.inaturalist.org)

[Vermont Atlas of Life \(vtecostudies.org\)](https://www.vtecostudies.org)

[Vermont Center for Ecostudies \(vtecostudies.org\)](https://www.vtecostudies.org)

[Vermont Lady Beetle Atlas](https://www.vtecostudies.org/projects/lady-beetle-atlas)

[\(vtecostudies.org/projects/lady-beetle-atlas\)](https://www.vtecostudies.org/projects/lady-beetle-atlas)



Ursine Spurleg Lady Beetle (*Brachiacantha ursina*)
Photo © Nathaniel Sharp



Polished Lady Beetle (*Cycloneda munda*)
Photo © Nathaniel Sharp

A Grasshopper Note

By Susan Sawyer

This is a bit of correspondence about a grasshopper I saw last summer. It was a very good year for many kinds of grasshoppers. I enjoyed seeing them flying around wherever I walked, watching them with my two-year-old grandson, who got very good at catching and holding them gently. On August 19, 2020, a warm and sunny day, I was with my drawing group in Craftsbury, just south of the Albany town line, at a place with wooded hills all around, a small pond and scattered clearings. While drawing, I noticed a soft scratchy sound and movement out of the corner of my eye. I could see a large grasshopper repeatedly hovering over a spot on the other side of a stump, going down, coming up again and hovering for half a minute or more. I've learned the new word "crepitate" for the crackling sound its wings made while it hovered.

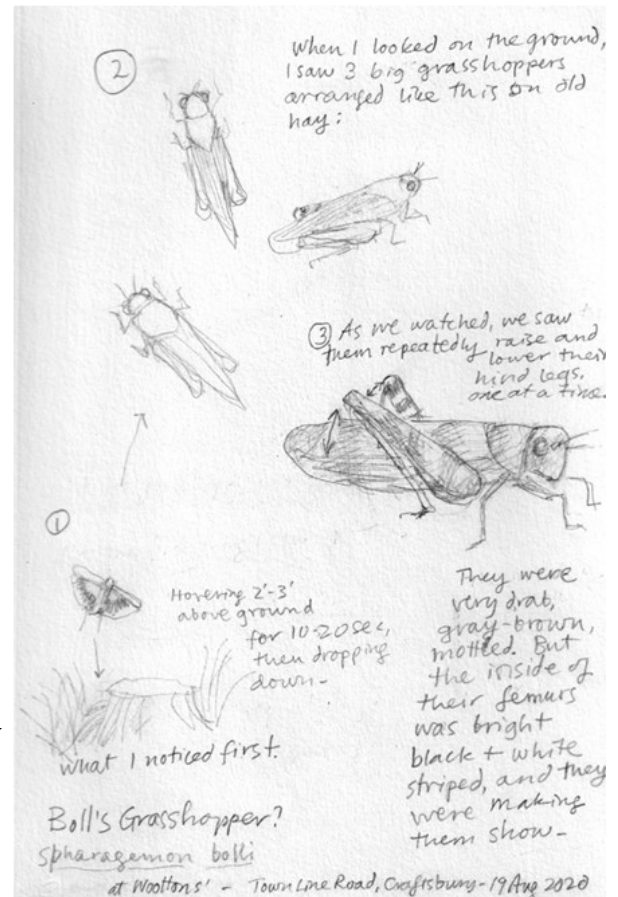
It stopped after a while and I sneaked around the stump, where I saw three grasshoppers on some mulch hay. I crawled closer to where I could watch them from about a foot away. They were the drabest of insects with pale gray-brown eyes and matching gray-brown bodies. They were just sitting there, about three inches apart, not facing each other, and not moving at all except to jerkily and intermittently raise and lower their flashy inner femurs, which were vividly striped black and white. It was mesmerizing. I didn't have a camera. I just watched, trying to notice all I could. After a few minutes, one and then the others walked away into long grass, and I went back to draw what I'd seen, so I could share it.

I thought about the crepitating grasshopper, and looked it up, and made a tentative identification. In the winter, looking at that page again, I sent a photo to Michael Sabourin, who sent it on to Don Miller. This is what Don said about it:

"Based on your description and drawings as well as the location and habitat, I'm quite sure you were seeing *Spharagemon bolli*. It is a species that crepitates as you noticed. I would not completely rule out *S. collare*, however, since it is quite similar. According to Daniel Otte, solitary males of *collare* seldom crepitate; those of *bolli* do. I wondered if you noticed a hint of yellow at the base of the hind wing? *Bolli* tends to show that but it is subtle. *Bolli* has more obvious cross-bands of the forewing than *collare*. I initially thought you might have been seeing the generally more conspicuous and common Carolina locust (*Dissoateira carolina*) but your description essentially rules that out.

"Band-winged grasshoppers have three distinct types of signals: sound, visual and contact. The leg raising you saw is one of the silent signal types. It varies from species to species as do the other signal types and even between sexes. I strongly suspect you were seeing two males and one female. Raising and lowering the hind femora is called "femur tipping." This is exhibited by both males and females and is involved in both male-male and male-female interactions. Thank heavens it is not known in humans, as it would seem pretty exhausting to me. We rely a great deal on variations in facial expressions, I've never thought I saw any behavior of this type in grasshoppers. They always look so stoic to me except when doing their crepitating thing!"

I have to agree – the courting of the three who were sitting on the mulch hay seemed solemn, not acknowledging each other in any obvious way, but spaced carefully, perfectly silent, not moving except taking turns occasionally signaling each other with striped legs. It was a treat to observe this ritual, and thank you to Don Miller for the confirmation and comments.



Susan Sawyer's Sketchbook page,
August 19, 2020
Photo: Susan Sawyer

Events and Programs of Interest:

Telephone Gap BioBlitz Extended Invitation:

By Mary Deller

Our Green Mountain National Forest's Telephone Gap virtual BioBlitz was originally scheduled to end June 30th, 2021. We didn't know what to expect when we changed the time frame to fit our need to be virtual. Over the past twelve months, we have been greatly impressed with participation and the important data documented. Thanks to all our participants for the outstanding photographs and the diversity of species observed. With the ongoing need to cover changing biological life cycles and the opportunity to inform Forest management, we've extended the Telephone Gap BioBlitz to September 30, 2021. There's more species to find and more places to find them, whether they fly, crawl, run, hop, slither, swim, just reach for the sun or thrive in the shade!

The number of observations in the BioBlitz is approaching 2,350. It's been difficult to deal with the variable weather this spring, but participants have been intrepid and have recently documented birds, plants, insects, and a fascinating assortment of lichens. Check out these latest finds on iNaturalist at <https://www.inaturalist.org/projects/gmnf-telephone-gap-bioblitz>.

Amphibians and reptiles are on the move and we'd love to beef up our list of species and learn more about the sites where they're found. Listen for singing frogs and toads and learn some new species and keep an eye and ear out for returning migrant birds. Telephone Gap has a variety of habitats and natural communities – get out and explore before mosquito season!

iNaturalist instructions and Telephone Gap maps are here to support you:

<https://www.fs.usda.gov/detail/gmfl/home/?cid=FSEPRD742756>

Any questions? Contact Mary Deller: mary.deller@usda.gov.

For a retrospective on New Hampshire's retired state entomologists Don Chandler, see:

https://media.unh.edu/media/Don+Chandler+-+Sixty+years+of+life+as+a+field+entomologist/1_gskecyaf?st=13

People interested in pollinators should check out this site:

Welcome Spring! Authors Speaker Series | Partners for Pollinators

North Branch Nature Center (NBNC):

Online programs: "Bugs in Winter" by Charley Eiseman

"Bees of the Northeast" by Spencer Hardy

"Butterfly ID & Ecology" by Bryan Pfeiffer

Also offering NBNC Summer Day Camp: For information see: info@NorthBranchNatureCenter.org. 802.229.6206.

Maine Entomological Society (MES):

Ringed Boghaunter Dragonfly Webinar:

The MES recently offered a one-hour webinar (with additional 20-minute Q&A session) on the rare Ringed and Ebony Boghaunter dragonflies presented by Mark Ward. The recording is now archived and free for public viewing:

<https://www.maineentosociety.org/webinar-archive/the-ringed-boghaunter-williamsonia-lintneri-challenges-and-strategies-to-detect-and-protect-a-rare-dragonfly-in-maine>.

For questions and/or membership information contact maineentosociety@gmail.com. Membership is \$15 a year.

Insect Photography with Roger Rittmaster (Archived MES webinar):

<https://www.maineentosociety.org/webinar-archive/how-to-shoot-insects-with-a-camera-by-roger-rittmaster>

Pitcher Plant Fly in Carnivorous Plants by Peter Kann (May 6, 2021): (click the link for info & to register)

<https://www.maineentosociety.org/events/mes-webinar-series-pitcher-plant-fly-in-carnivorous-plants>.

New York Times:

"Let Us Now Praise Tiny Ants" by Brooke Jarvis (4.5.2021) recommended by a MES member:

<https://www.nytimes.com/2021/04/05/science/ants-wilson-photography-niga-rice.html>

Camden Library, Camden, Maine:

"Four Wings and a Million Prayers" presented by Bryan Pfeiffer.

This is an intimate look at the sensational world of insects. Here is a link to the full description:

<https://www.librarycamden.org/event/cmly-four-wings-and-a-million-prayers/>.

Byran Pfeiffer's presentation can be viewed on the Camden Public Library Programs YouTube Channel, free of charge, at this link: https://youtu.be/_CkXI5p6cY4. You are welcome to share the link with others. Any questions? You may e-mail Julia Pierce (jpierce@librarycamden.org) for more information.



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Leafcutting bee (*Megachile inermis*) on cut leaf Photo: Denis Doucet, iNaturalist.org
<https://creativecommons.org/licenses/by-nc/4.0/>