



A Giant Swallowtail nectars on Butterfly Bush blossoms.

THIS ISSUE

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And the Largest of Butterflies Goes Largely Unnoticed, Too

Indicative from the title, last month’s opening column detailed the life and ecology of North America’s largest moth. The Cecropia can attain a wingspan of up to seven inches. Therefore, its larva is also the largest caterpillar you will ever see on the continent. Currently we have a dozen of these beasts, ornately adorned with orange, yellow and blue tubercles on live display in our nature center. Amazingly, most citizens who have lived their whole lives in Michigan have never even heard of the species, much less seen one in any stage of its life.

The same can be said for Michigan’s and North America’s largest butterfly. Ask anyone to name the largest, and you can guess the nearly unanimous response: yup, the Monarch. For all the attention given to its life cycle, its connection to milkweed, its migratory behavior and concern over plummeting populations in recent years, the hyper-exposure has come at a cost to the tremendous diversity of other butterfly (and moth) species that populate our neighborhoods - each impressive in its own right, and most suffering some degree of decline for many of the same reasons as seen with the Monarch.



Pinned specimens of our largest moth - the Cecropia, (left) and butterfly -the Giant Swallowtail. Note the marked difference in the upper-wing vs. the under-wing of the swallowtail.

Michigan alone is home to over 150 butterfly species (and another tenfold species of moths) yet most residents would be hard pressed to name a mere ten, much less, identify one if it alit on a flower in front of them; or even far less likely, point to the specific larval host plant in the environment to which it owes its existence.

St. Martin’s Press’s *Golden Guide to North American Butterflies and Moths* lists the maximum wingspan of a Monarch at 3.9 inches. That of the Giant Swallowtail – yes, Michigan’s and North America’s largest – is listed at a whopping 5.5 inches. Other sources list it at six inches.

Despite the Monarch's migratory bent, the Giant Swallowtail's range in the Western Hemisphere is far more expansive. Populations can be found as far south as Argentina and northward to the northernmost states in the Eastern U.S. In Michigan its range extends about halfway up the Lower Peninsula.

Fertile female Giant Swallowtails need to locate members of the citrus family (Rutaceae) in order to breed. The most variety grows in tropical and sub-tropical regions but a few members extend northward into Michigan, and it is these on which the larvae must feed in order to produce the next generation.

Hoptree (a.k.a., Wafer-ash or Wafer-leafed Ash) is a small tree and Prickly-ash a thorny shrub. Both are found sporadically in overgrown fields and in the understories of open forests across the southern L.P. Mostly in August and early September I've found Giant Swallowtail eggs as well as the larvae in all stages of their growth nearly anywhere I come across either of these citruses.

The butterfly stage appears most prevalently, for now, in early to mid-August. This year I've seen an inordinately high number before the end of July; yet, one more indication of the rhythmic pulse of the natural world shifting with our rapidly changing climate.

A female that locates a small Hoptree circles it with relatively slow, liling flaps in contrast to smaller species. She alights for a mere second or two, wings fluttering upright to help her balance, then deposits a single globular orange egg on the top side of one of the three leaflets that comprise the compound leaf. She may circle the tree and oviposit in this manner several more times before moving on in search of another Hoptree or Prickly-ash.



A recently deposited egg on a Hoptree leaf.

A newly-hatched larva is dark brown with a lighter colored 'saddle' through the mid-section. Within a week it will have increased its mass many times over and be ready to molt into its second instar. Now it takes on a notably glossy appearance – all the better to mimic a wet bird dropping that could have recently fallen from above and stuck to the leaf. The tip of its abdomen is slightly expanded and of a tan to grayish hue, the shape and color of which makes it appear even more turd-like. The thoracic segments immediately behind the head are more inflated than the rear making the entire front of the body look similar to the head of a snake or other vertebrate animal.

Yes, it is one bizarre, almost alien-looking little creature. As it molts and grows through the five larval instars, it continues to defy the classic image most of us possess of what a caterpillar should look like. In the final two instars it becomes so large that it can no longer pull off the 'wet-bird turd' act. For starts it is now too big and heavy to perch on the top of a leaflet without the whole leaf sagging downward. The glossy sheen is gone, however, intricate details become apparent with close inspection. A fine necklace of pale ringlets crosses the inflated thorax. Intermittent, tiny purple flecks are scattered across the brown and gray patches that comprise the background down the length of its dorsal side.

As a youth quite a few years before experiencing my first live one, I was puzzled by the page in the Golden Guide stating that this caterpillar was also known as the 'Orange Dog.' 'Orange' I understood to not connote the caterpillar's color but rather, the tree in Florida orchards where it was probably frequently found. But why 'dog'?

My first discovery of Giant Swallowtail larvae occurred in the mid-80s when I was a wildlife student at MSU. I found several of them on small trailside Hoptrees at Legg Park in Okemos. I eventually discovered trailside Prickly-ash shrubs with larvae in another location at the park, as well. I took a few home to raise.



Having larvae in my care provided unlimited opportunities to observe them at all angles. One day I happened incidentally to view a large caterpillar from an anterior aspect, face-on. It perched on a Hoptree twig in the typical posture of repose true to any resting swallowtail species - head tucked in front of, and beneath its inflated thoracic segments.

My mind's eye instantly conjured the sketchy image of a dog's face... The enlarged thorax provides the contour of the head, sans ears. A horizontally-spaced pair of dark spots on the front slope of the thorax can be imagined as eyes. The caterpillar's actual head, much smaller than the

thoracic 'faux head', transforms into the dog's nose. The look of a stubby 'muzzle' outlined in white is provided by the abrupt tapering that occurs between the bulbous thorax and the tucked head.

The Giant Swallowtail larva employs an adaptive defense that is seen in all members of the butterfly family, Papilionidae. When disturbed, the front half of the body is thrown back and a paired gland called the osmeterium is suddenly everted from a small slit behind the head.

The abrupt appearance of 'horns' may be startling, even fearsome to the unsuspecting human, but the soft, moist organ is incapable of penetrating skin. The odor that emanates from the secretions is quite powerful, though. Depending on the species, the color of the osmeteria range from yellow to red, and, at least in part due to the chemical makeup of the plant on which they feed, each species emits its own unique odor.

The everted osmeteria of a Black Swallowtail larva, which feeds on members of the carrot family, smell appropriately like a strong cologne that only a rabbit could love. Those of the Giant Swallowtail are a deep blood-red. They do not smell citrusy to me, but rather musty and generally unpleasant. When showing this to school children and giving them an opportunity to take a whiff, one teacher said it smelled to her like old, sweaty gym socks.

Of course, with gland secretions this odiferous the volatile chemical evaporating into the air most likely protects the caterpillar from attack beyond mere sight and smell. I can imagine a bird grasping the caterpillar's body with the tip of its bill. When the head is thrown back and the osmeteria extended, there seems to be a strong likelihood that a horn would come in contact with the open bill, the tissue in the bird's mouth, its nostril opening atop the beak or perhaps even its eye. If the chemical smells this strongly it must be as unpleasant or worse when coming in contact with any mucous membranes.



When disturbed, the Giant Swallowtail larva everts its osmeteria to defend itself.

Perhaps osmeteria are a deterrent to predatory insects, as well. Paper wasps, Yellowjackets and various other wasps and hornets seek caterpillars to dispatch and feed to their own larvae in the nest or hive. Other smaller parasitoid wasps may seek one so as to inject eggs into it, from which larvae will hatch and then consume the caterpillar from the inside out. The backward swing of the osmeteria, the odor, or any contact with the chemical could act as its physiological pest repellent.

By the fifth and final instar a large and heavy Giant Swallowtail larva chooses to rest between feeding episodes securely perched on a Hoptree or Prickly-ash twig a short crawl from its dining spot. A lucky

few of the many that hatched from eggs survive this far into the larval portion of the life cycle. By late August or early September a mature female may exceed two inches in length.



A Giant Swallowtail chrysalis suspended from a Prickly-ash twig. Note the silk strand that acts to keep it upright at an angle to the twig.

After purging its gut the caterpillar will wander, usually completely off the tree or shrub to eventually settle on a twig, branch or trunk of nearby woody vegetation. Here, again in keeping with methods common throughout members of the swallowtail family, it will attach itself with silk, upright and at an angle to the surface. It attaches an especially strong ‘belt’ of silk around its thorax to the twig to help keep it upright and secure through the long, cold months ahead. About two days later it sloughs its larval skin to reveal its chrysalis form, appropriately colored with a patchwork of brown and gray hues; all the better to help it avoid detection by any of a host of would-be predators.

In keeping with the rest of its perilous existence, very few that make it to the chrysalis stage will survive until spring. If not a predator, the harsh elements will likely get to it.

In Michigan you will be hard-pressed to find a Giant Swallowtail in flight in early June but some are out there. These manage to find each other, mate, then distribute eggs. The larvae grow on local Hoptrees and Prickly-ashes and transform rapidly into chrysalis form by early July. Naturally, survivorship is much greater in this stage in early summer than for those over the long winter months. The warmth induces development and emergence of the adults within a single month. In early August, the lepidopteran-trained eye spots adults regularly as they flutter and sip nectar in the sunshine provided by bloomers of the season such as Butterfly Bush, Bull Thistle, Joe Pye Weed, Teasel, and others.

PLANT A HOPTREE

While found throughout Lower Michigan, Hoptree is quite sporadic in its distribution. Upon moving to this location north of Williamston in the late 80s we never encountered one on our acreage, nor along any local roadsides.

In the late 90s I visited Wildtype Native Plant Nursery in Mason. With Giant Swallowtails in mind I purchased a small potted Hoptree then planted it next to the front of our driveway. By the following summer not only had it tripled in height, but female Giant Swallowtails were already locating and ovipositing on its leaves.

A few years later, now much larger and bushier, it began to produce hanging clusters of disc-shaped, winged seeds. Many more years later, Hoptree volunteers of all ages and heights are everywhere; no doubt, spreading onto neighbors’ properties, as well. Larvae have become an annual late summer occurrence.

Would you like to schedule a visit to dig up a small Hoptree to transplant in your yard? Contact us to make an appointment. Would you like one for your yard but don’t have the time to visit? We can dig one up and even deliver it on request. Simply contact us to make the arrangements.





GIANT SWALLOWTAILS COME TO SCHOOL

More Michigan schools are opting to start the academic year in late August. This mere two-week shift opens the door to exposure to a number of local, natural phenomena that are much less available, say, after Labor Day.

For instance, imagine the excitement for the students to not only kick off the school year learning about the state's and continent's largest butterfly, its bizarre larva, its life cycle, and the plant life in the environment without which it cannot survive, but to actually experience a live one, or better yet, raise one in the classroom. Once transformed

into a chrysalis it can be stored in a designated cool place then brought back into the classroom in May. By the final week of classes, students will have a chance to witness the adult butterfly's emergence. After photo opportunities it can be released in the school yard.

Nature Discovery can provide this opportunity and easily adjust the learning experience to any grade level, K through high school. A presentation could include beautiful Powerpoint images, live caterpillars and even a small Hoptree to plant on school grounds.

Additional option! Read on in this newsletter about raising caterpillars of the beautiful Luna Moth in the classroom to kick off the school year, too.

-Jim McGrath



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including these most recent donors to our mission...*

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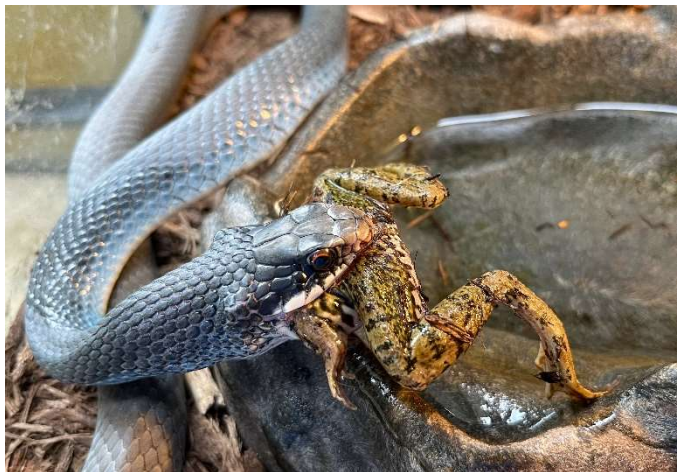


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*Visit Our
Nature Center
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*Suggested Minimum Donation:
\$5/person/hour*

The sky's the limit for natural science learning here – with a Michigan twist! Individual adults, couples, individual families and small groups are welcome to schedule an intimate outdoor or indoor visit to what we call “The Biggest Little Nature Center in Michigan,” and “Home to the Largest Zoo of Michigan-native Reptiles and Amphibians.” The unique, hands-on experiences here are unrivaled by a visit to any “standard” zoo or nature center! We will bring snakes, turtles, frogs and salamanders out of tanks to interact with adults or students of any age or grade-level.

Identify and feed “the grand slam of Michigan turtles,” all ten species native to our state, as they swim in pools at your feet. Meet, pet and feed “Milberta”, our always hungry Red-footed tortoise.

Handle any or all of Michigan’s three species of garter snakes while learning how to tell them apart, then watch them gobble up worms and live frogs. Hold or “wear” a gentle 6-foot Black Rat Snake – the largest in the state!

Many more snakes, turtles, frogs and salamanders to identify and feed. See our Caterpillar Farm. Take a guided walk on our trails to identify birds, insects, trees, vines, and invasive plants.

Ask about arranging guided interpretive experiences or guided birding outings, for your small group of kids, adults or families at a local natural area of your or our choosing.

Contact us for more information or to make an appointment.



Nature Discovery

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Raise **LUNA MOTH** Caterpillars Now!



All you need is access to a **WALNUT** or **HICKORY** tree!

EDUCATORS:

Here's a unique, living project that can be incorporated now into any classroom, K thru HS, to kick off the school year! Caterpillars feed on leaves and grow for four weeks before spinning cocoons by the end of September. They will be due to emerge as adult moths just in time for the end of the school year in early June to begin the next generation.

With advance notice, middle school and high school science/biology classes can even make arrangements for individual students to raise their own.

Schedule a special presentation featuring Powerpoint images and live specimens covering the interesting life cycle, behavior and ecology of this beautiful but seldom-seen moth.

PARENTS:

Raise Luna larvae with children right at home. There is so much to be learned through daily nurturing and observation of your growing subjects.

LEPIDOPTERA ENTHUSIASTS:

Hey, this is hardly just kid-stuff! Any adult with an interest in the natural world is sure to become highly engaged in this unique opportunity.

Five young larvae, complete with detailed care instructions for only \$15.

NO NEED TO PURCHASE ANY EXTRA SUPPLIES. All you need is a clean, dry medium-sized jar to get started. Contact us to make a purchase, to discuss larger purchases, to arrange a classroom presentation, or to ask specific questions. Hurry, these are only available for a limited time from mid-August thru early September.

Around the State in August

- ❖ *Saturday, August 3: 10am to 2pm. MI Reptiles & Amphibians Exhibit; LEAF Live, Mott Community College, LaPeer.*
- ❖ *Sunday, August 4: 10am-2pm. MI Wildlife Exhibit; Eastern Ingham Farmers Market, Williamston.*
- ❖ *Saturday, August 10: 10am to 2pm. MI Reptiles & Amphibians Exhibit; Dahlem Environmental Center, Jackson, MI.*
- ❖ *Saturday, August 17: 11am to 2pm. MI Reptiles & Amphibians Exhibit; Hessel School House, Hessel, MI.*
- ❖ *Saturday, August 24: 10:30am. MI Snakes Presentation; Huron County Nature Center, Port Austin, MI.*



Reading, Acting, Voting for the Environment

https://www.nytimes.com/interactive/2024/08/11/climate/earth-warming-climate-tipping-points.html?campaign_id=9&emc=edit_nn_20240812&instance_id=131482&nl=the-morning®i_id=97652655&segment_id=174916&te=1&user_id=e2b8dd8c9b543fb8c35d5dd30658067e

<https://insideclimatenews.org/news/06082024/climate-advocates-rally-behind-tim-walz-vp-pick/>

<https://insideclimatenews.org/news/08082024/vp-candidate-tim-walz-agriculture-conservation-connections/>

-JM

The next generation would be justified in looking back at us and asking, “What were you thinking? Couldn’t you hear what the scientists were saying? Couldn’t you hear what Mother Nature was screaming at you?” - Al Gore

I don’t want you to be hopeful. I want you to panic. I want you to feel the fear I feel every day. I want you to act. I want you to act like you would in a crisis. I want you to act like your house is on fire, because it is. - Greta Thunberg

The personal actions that cut climate pollution fast are to go flight-, car-, and meat-free. Start with the one that feels most feasible for you; if you can’t totally go without, aim to cut your consumption today at least in half. – Kimberly Nicholas, Under the Sky We Make

What if we had storytelling mechanisms that said it is important that you know about the well-being of wildlife in your neighborhood? –Robin Wall Kimmerer



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