

## THIS ISSUE

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*Together With Nature for the Planet*

# The Lion in the Sandbox



A formidable predator lurks just beneath the surface, possibly in the very sandbox where a young child may play. Is it dangerous? Yes! That is, if you are less than a quarter inch in stature. What about a half inch? You'd probably escape but you better keep your wits about you and watch where you step... just to play it safe.

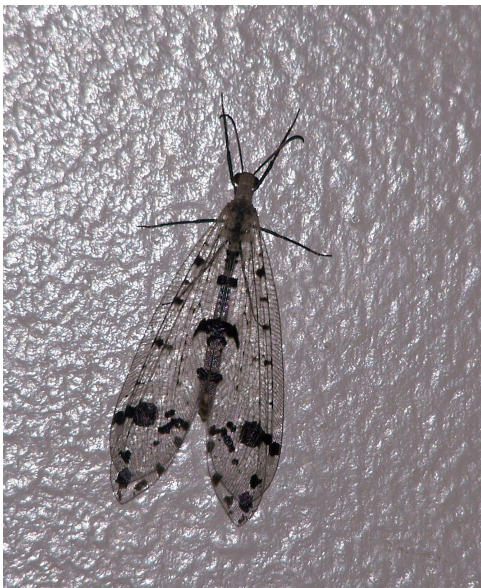
Luckily, the larger you are the less dangerous to your health this predator can be. In fact, the tables have completely turned if you are as large as, say, a small child. You are likely to frolic in the sand completely unaware that the predator sharing the sandbox with you even exists - all the while, perhaps with the aid of a colorful plastic shovel and bucket, wreaking havoc on its simple existence like a cute, obviously destructive, humanoid version of Godzilla.

When the child eventually leaves the sandbox the mini-hunter gets busy restoring order to its simple world. Hours later its quiet, largely uneventful life can resume. It has finished reconstructing the delicate, deadly sand trap that had been destroyed by the rampaging giant.

The playing child is not the only one unaware of the antlion larva's existence. The parent is likely in the same boat. That might be just as well for the antlion. While it is said that a little knowledge can be dangerous, a little knowledge about the antlion is likely to be dangerous to the *antlion*! Sharp pincers inject paralyzing digestive enzymes, so yes, that would qualify it as *venomous* (not *poisonous*, btw). This information by itself may be enough to incite a call to the Orkin Man to come fumigate junior's sandbox. With social media aiding and abetting the alarm, pest control companies would find a new, perceived "enemy" on which to wage chemical battle for profit.

## WHAT

Antlions share the insect order, Neuroptera, with lacewings. The order name translates to "nerve wing" or "net wing" pertaining to the finely-branching pattern of thin veins in their translucent wings. The adult antlion may easily be mistaken for a damselfly because of its thin, elongated abdomen, however the antlion does easily-noticed antennae while those of the damselfly are so minute your eye would need to get very close indeed to notice them at all. The antlion adult is also a much weaker flier and literally floats through the open air; this, in contrast to the stronger, more direct flight required of the damselfly in order to chase



*The Spotted-wing Antlion and the Common Antlion (similarly sized/shaped but with unmarked wings) are found in Michigan.*

and capture mosquitoes and other small airborne insects. Literature states that many species of adult antlions feed on pollen and nectar from flowers, however, I have personally never seen one in the act. Although the adult antlion is largely nocturnal one may occasionally be flushed from a daytime perch among overgrowth and then take wing only to be wafted away by the mildest of breezes. It lays its eggs, appropriately, in sandy or dry soil conditions.

The insect is given the name in recognition of its more charismatic, predatory, stout-bodied, larval stage. Yet, ironically, it virtually lives its entire days hidden and overlooked. It burrows under the dry, granular substrate, strangely, always rear-end-first. Steady observation of the movements of an unearthed larva quickly evinces the fact that this insect has no “forward” gear in its physiological drive train.

Evidence of the antlion larva’s presence exists almost solely in the presence of the unique pit trap it is able to efficiently excavate within its domain of fine, dry granules. The pit is created over a series of hours by reverse-creeping in a tight circle, around and around just under the surface, all the while pitching sand/dirt upward and outward with its pair of elongated pincers. The end result is a shallow, granular pit fashioned as a perfectly-shaped, inverted cone. A strong wind, rain or disturbance from any passing larger creature can quickly erode or destroy the fragile structure outright. No matter to the antlion. It is destined to dig and reconstruct the pit hundreds of times through the course of its existence in this metamorphic stage. When it is finished it keeps hidden directly beneath the inverted vertex of the cone with only the tips of the pincers protruding, poised to snatch a falling victim. It then bides its time for minutes, hours, perhaps even days awaiting unsuspecting prey.

When an ant or other small insect wanders over the unstable rim of the pit it suddenly finds itself sliding down a sandy slope. The granules underneath are set in motion to deliver it directly to the snapping pincers. Often, if an ant is lingering at the pit’s rim a few errant granules may roll to the bottom. Dislodged grains that make contact with the pincers signal a presence at the rim of the pit. This incites the larva to begin flicking grains up at the rim triggering more grains to slide. If some of the grains under the ant’s feet are set in motion in this manner, terra firma collapses beneath it.

The antlion larva’s pincers are hollow and are used like curved hypodermic needles. It pierces the seized prey item, injects digestive fluid into it then sucks the liquefied contents for nutrition. The hollowed-out exoskeleton is then discarded, often unceremoniously tossed up and out of the pit with a flick of the pincers.



*The antlion’s pincers serve as a pitching shovel, a grabbing mechanism and piercing two-way straws.*

Depending on the age and size of the antlion some pits may be up to two inches in diameter; others the size of a quarter, a nickel, a dime, or much smaller. Where you find one, others are often nearby.

When an antlion has reached the end of its subterranean larval stage it fashions a specialized, globular cocoon around itself coated with sand. Buried under the surface the finished product containing the pupal stage looks like a small marble of sand. Several weeks later, perhaps in mid-to-late summer, the adult



form emerges to begin the dispersal and reproductive stage. The newly-emerged insect immediately digs to the surface and climbs the nearest grass stalk or other upright object in order for its body to properly elongate and dry and for its wings to properly expand and stiffen.

## WHERE

The antlion is a fairly common insect in suburban and rural areas, but appropriate habitat - while simple in structure and suitability – is quite specific and localized. This, however, doesn't make the insect necessarily difficult to find. Just look for sand. Soil that is sandy in content, dry or powdery, and exposed to relatively little precipitation has strong potential, too. After a rain, sand drains and dries relatively quickly. By contrast, loamier soil may remain moist and compacted for days after a soaking rain. Just when it is beginning to dry another rainy day may come along. Indeed, antlions can be more difficult to find in areas of the state - generally, more southern and eastern counties - dominated by loamy soils.

A Great Lakes shoreline on a relatively warm and precipitation-free day, therefore, is a great place and time to find the antlion's predaceous larvae; however, not so much on the wide open, wind-swept beach as further away from the water line, where stabilizing grasses, shrubs and trees have taken hold.

Good micro-habitats exist in almost any rural or semi-rural backyard no matter where you live in the state. While by far, most of our six-plus acres is unsuitable for antlions to thrive I can find many dozens on any dry, mild day in two very specific locations.

The first is in the soil immediately abutting the east wall of our house. Why the east, and *only* the east wall? Weather systems (including wind and rain) generally move from west to east. When rain falls from this direction it is angled to some degree making it more likely to soak and run down the west-facing wall. It then saturates the ground at the base. Conversely, the east-facing wall, even in some of the heaviest downpours, barely ever gets wet. Therefore, the ground immediately at its base receives little to no moisture, evinced by the powdery dry nature of the soil here. A concrete patio abuts most of the length of our east wall. Soil only exists along the wall within the low brick wall of our tortoise pen. Just now (it's sunny and about 65 degrees) I stepped into the pen and counted fourteen antlion pits over its twelve-foot length. Not a single pit was more than two inches from the wall.

The second location is under the boughs of a huge Norway Spruce growing close to the north wall of our attached garage. During a rain, a spruce's branch structure naturally funnels water outward, toward the tips of the branches. As a result, far more "dripping" occurs around the perimeter of the branches than directly under it. Thus, the soil under it is almost as dusty and dry as that against the east wall. Within about a twenty-foot diameter centered over the trunk I counted over thirty pits of varying sizes among a carpet of dry fallen needles.



*Among a thin layer of dry fallen needles under the spruce, seven antlion pits of varying diameters are clustered in an area not much more than a foot across.*

You can look for antlion pits in still other places within your yard or in any setting conducive to creating dry, granular soil. In a child's sandbox, of course. We find pits underneath our overturned kayaks next to the garage, too. Search the ground under any other objects that keep water from reaching the ground beneath them. However, keep in mind that an object that is firmly in contact with the ground, like a log or a board, is not hospitable to them. The antlion must have some amount of airy space above the pit.

With this basic knowledge it is easy to purposely *create* habitat conducive to antlion activity by merely tweaking the landscaping a bit. For instance, a circular patch of mulch laid beneath the boughs of a

backyard spruce may be groomed to geometric perfection, but for all the promise of that particular naturally-dry location for antlion propagation, the bed of mulch piled on top of the soil eliminates it. Consider going mulch-free under a backyard spruce... and along the east wall of the house for starts.

## HOW

The ecological needs of an antlion larva are specific, yet starkly simple. This makes it an easy candidate for care and observation in captivity. We save single-serve plastic apple sauce cups or shallow, open containers of similar dimensions then partially fill them with sand or dry soil. We scoop antlions from the base of their pits in the soil then deposit one in each cup. Within a day a perfect pit has been formed in a cup and the antlion is poised for its first ant. Any child can secure a live ant from outside, drop it into the cup, watch it slide down the pit and then get pulled out of site by the pincers. An insect a day is plenty for a large (half inch) larva. It may be capable of eating two if you drop one into it early and another late in the day. If you miss a day or two or even a week, no matter. It takes a long time for these creatures to



*In an apple sauce cup the antlion often tosses sand grains up and over the rim as it excavates its pit trap.*

starve to death, however, the more often you feed it the faster it will grow, then pupate inside its sand marble to eventually emerge as an adult.

Over decades, I've used captive antlions in a variety of ways that allows for experiential lessons in basic ecological concepts. I often distribute them with complete printed care instructions to kids at birthday parties, at our summer day camps and within school classrooms.

The care and observation of an antlion can be simply utilized as a cool 'buggy' pet for a young child, but there is plenty of potential to make an in-class or at-home science project out of it. The connections between the few living and non-living components of this simplest of

ecosystems make it a perfect hands-on introduction to ecology! Older students can keep records and data sheets on frequency, numbers and species of invertebrate items offered, as well as other parameters related to growth, temperature and more - much like the accumulation of data many scientific endeavors require before sound conclusions can be drawn.

The larva doesn't always have to exist in your care sight-unseen. In our antlion care sheet I recommend viewing it safely by carefully shaking the cup's dry contents onto a sheet of paper. The disturbed antlion can easily be steered around with the tip of a pencil for better viewing. Keepers can then see its signature reverse locomotion first-hand until it backs into the pile of sand and quickly disappears beneath it.

With care the dainty creature can be scooped from the sheet by sliding another sheet of paper under it and then depositing it onto a child's open palm. (Don't worry about it biting. I've handled hundreds over my lifetime and never been bitten. I'm not convinced that one would be capable of it even if it tried.) To return it to the cup the paper holding the sand pile and larva can be carefully lifted by the sides and bowed. One end of the paper can then be placed over the cup and tilted, allowing the sand and the antlion within it to neatly slide back into the cup.

Would you like to keep your own antlion to raise? Although autumn is advancing and insects outside will soon be cooling down and entering winter dormancy an antlion kept inside will continue to eat. If you are unable to find ants outside to feed it, many pet stores sell live tiny crickets which it will take just as well. You can search for, and acquire your own antlion here and now at Nature Discovery. Read on for details...

*-Jim McGrath*

# Nature Discovery

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517.655.5349 [naturedisc87@gmail.com](mailto:naturedisc87@gmail.com) [www.naturediscovery.net](http://www.naturediscovery.net)

## Visit Our Nature Center by Appointment



### *Suggested Minimum Donation: \$5/person/hr*

The sky's the limit for natural science learning here – with a Michigan twist! Through the duration of pandemic restrictions individual adults, couples and individual families are welcome to schedule a safe, 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, in-person, hands-on experiences here are a welcome relief to a student's screen-learning time! Weather-permitting, we will bring snakes, turtles, frogs and salamanders outdoors to interact with adults or students of any age or grade-level. Visitors are required to wear a mask during indoor visits.

Identify and feed “the grand slam of Michigan turtles” - all ten species native to our state! 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. Take a guided walk on our trails to identify birds, bugs, trees, vines, and invasive plants as we encounter them.



Ask about arranging weekly or monthly visits or regarding custom natural science lessons to supplement your student's interests and grade-specific science requirements.

Contact us for additional information or to make an appointment any day.



# *Make an Appointment to Find and Keep Your Own Antlion*



*The predatory larva eats ants and other small insects.*

No matter the age of the student here is a terrific in-person, hands-on natural science project that can be implemented as a supplement to, and relief from on-screen learning.

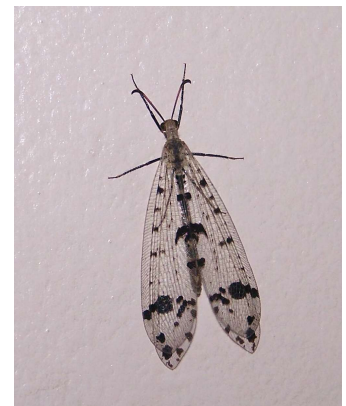


While insectivorous antlion larvae can be found hidden under their pit traps through any warm months of the year you can still find them in the fall on mild, dry days. Dozens of them are scattered in several locations right outside our nature center doors. Parents and students can partake in an antlion pit hunt and count how many you find. Then with a spoon one can be carefully removed from its pit and placed in a small cup of sand to take home.

We composed our own antlion care sheet, offering printed details about this unique insect's life cycle and tips on how to nurture it until it eventually pupates and metamorphoses into a winged adult.

Students will acquire first-hand experience with insect life cycles, insect anatomy, and predation. Through first-hand example older students learn about basic ecological relationships. They can also keep a feeding log and collect other observational data. Study antlion life history in online searches and/or by reading the opening column in our October 2020 newsletter, then complete our fill-in-the-blank antlion life history worksheet.

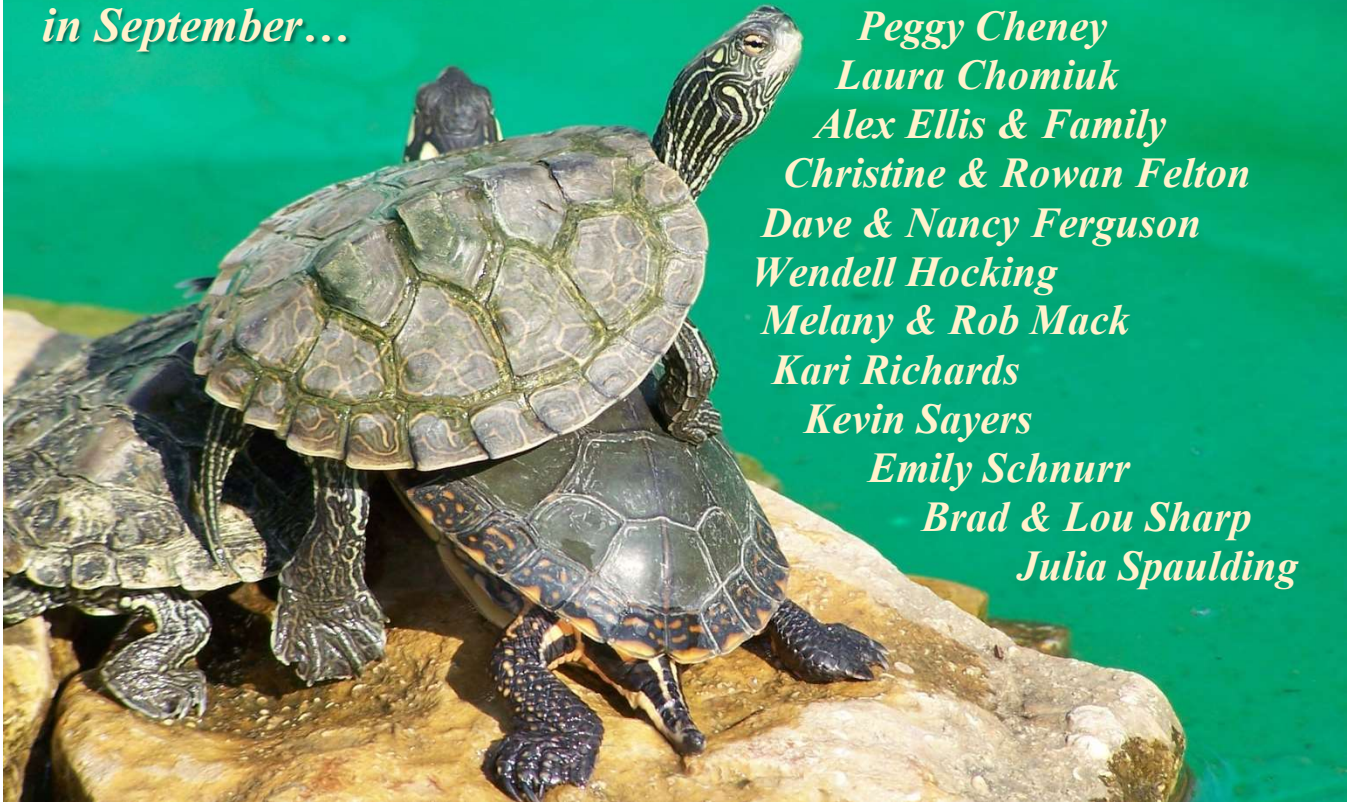
Make an appointment soon while the weather remains mild to find and secure your own wild antlion. Can't make it on a warm, dry day to find your own antlion? That's okay. We have secured a number of antlion larvae in individual cups that we are keeping in the center for interested visitors to take home, no matter what the weather outside on that day.



Of course, there is so much more to see and do within our huge zoo of Michigan-native reptiles and amphibians. Masks are required for all indoor visitations. We request a minimum donation of \$5/person/hr to visit our center throughout the duration of the COVID-restriction period.

***Nature Discovery also offers a wide range of fun, *personalized, in-person natural science, physical science and chemistry lessons* to complement hybrid learning strategies for students of any grade. Contact us to discuss specific topics and details!***

*Our sincerest thanks to those who have supported us by way of generous donations throughout this challenging time, including these donors in September...*



*Peggy Cheney  
Laura Chomiuk  
Alex Ellis & Family  
Christine & Rowan Felton  
Dave & Nancy Ferguson  
Wendell Hocking  
Melany & Rob Mack  
Kari Richards  
Kevin Sayers  
Emily Schnurr  
Brad & Lou Sharp  
Julia Spaulding*

## ***‘Together With Nature’ Cures Planetary Woes***

In order to have any hope of solving the planetary climate crisis we agree that there needs to be immediate serious commitment by every member of society. Check out this op ed in the July issue of *Financial Times* entitled, Why We Need to Declare a Global Climate Emergency Now.

<https://www.ft.com/content/b4a112dd-cafd-4522-bf79-9e25704577ab>

We just signed a statement of commitment to uphold four designated nature-based principles to fight the growing planetary crisis as formulated by Together With Nature.

<https://www.togetherwithnature.com/>

From the site: *As leaders in science, conservation, restoration, development, and business, we are united in our support of the four Together With Nature Principles for nature-based solutions to responsibly tackle the climate crisis, restore biodiversity, and benefit planetary health and human wellbeing.*

The commitment involves living to implement and promote these four principles:

1. Cutting carbon emissions;
2. Conserving and protecting existing ecosystems;
3. Being socially responsible; and
4. Being ecologically responsible

As opposed to the current source of our nation’s shame...

[https://insideclimatenews.org/news/06102020/superfund-trump-administration-andrew-wheeler-climate-change-epa?utm\\_source=InsideClimate+News&utm\\_campaign=9f4f752795-&utm\\_medium=email&utm\\_term=0\\_29c928ffb5-9f4f752795-327904609](https://insideclimatenews.org/news/06102020/superfund-trump-administration-andrew-wheeler-climate-change-epa?utm_source=InsideClimate+News&utm_campaign=9f4f752795-&utm_medium=email&utm_term=0_29c928ffb5-9f4f752795-327904609)

-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*



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**[ Union of  
Concerned Scientists**  
Science for a healthy planet and safer world



RSPO.org



Worldwarzero.com

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