



# Life Discovered

To share knowledge and improve education, health, agriculture, the economy, and conservation in the world



Photos by John Pickering

Vol. 1, Issue 1 "It makes people like moths."—Cameron Prybol

Mark your Calendars!

## Welcome to Life Discovered!

30 April Moth Party @ Sandy Creek @ 7:30 pm! Check Facebook for emerging details. Come help us kick-start a new observation site!



Photo: John Pickering

The amount of work that goes on behind the scenes at *Discover Life* is often tremendous, but remarkable. *Life Discovered* is our attempt to connect the human aspect of the organization to its science. Every day scientists, students, and volunteers across the world collect data for [www.discoverlife.org](http://www.discoverlife.org). They wake at 3:30am to photograph moths by porch lights, hang bed sheets in the woods erecting observation sites, sit for hours at computers identifying moths, argue, laugh, tell stories, eat tangerines, drink coffee (lots of coffee!), and enjoy every minute of it. *Discover Life* is a living, breathing organism. It is both a scientific encyclopedia and a broad family of people with a passion for life and discovery, for science and education.

In these monthly newsletters you will find articles, updates, news, factoids, calls for volunteers, and anything else we can think of that will connect you—the dedicated and passionate—to what others in the *Discover Life* universe, and beyond, do. We welcome your suggestions and comments, but, most of all, we thank you for making *Discover Life* extraordinary. Enjoy!

—Anthony Sadler, Editor



Photo: John Pickering

### Did You Know?

Scientists Jesse Barber and William Conner from Wake Forest University discovered certain non-toxic Tiger Moths, such as the Milkweed Tiger Moth, *Euchaetes egle*, mimic the sound of toxic moths to avoid being eaten by bats!

# New Mothing Site at Sandy Creek

Permanent site, volunteers needed



Photo: Tori Staples

**D**iscover Life partnered with the ACC Department of Leisure Services to observe moths at Sandy Creek Nature Center.

Tori Staples received a \$500 grant from the UGA College of Agriculture and Environmental Sciences to fund the project and currently has applications to other organizations, including the National Wildlife Federation, for additional funds.

Since February, Tori and Cameron Prybol have photographed nearly 50 species and have a healthy competition with Pick's Blue Heron site over biodiversity. Team Sandy Creek already has a handful of species not yet seen at Blue Heron!

This site is the first of a permanent, global network to

observe biodiversity.

We need all the volunteers we can get. Participants will photograph moths and other insects. We'll identify your moths to species and share your data on the web.

On April 30th, *Discover Life* will throw a mothing party to kick off the site at the Walker Center at Sandy Creek Nature Center at 7:30 p.m. It's also Pick's 60<sup>th</sup> birthday! He urges everyone to come see if he can make it to the party before having another heart attack.

Faculty, students, and anyone interested in contributing meaningful data are welcome. To participate, contact Tori Staples at [tori@discoverlife.org](mailto:tori@discoverlife.org).

# Digitizing Museum Specimens

Data Collection, volunteers needed



Photos: Alec Weil

**E**ver dream of scouring the archives of natural history museums to collect data for science? Think *Old Weather*, but more exciting. You would be documenting life!

*Discover Life* is partnering with UGA Entomologist Rick Hoebeke at the UGA Museum of Natural History and the Tri-Trophic Thematic Collection Network funded by the National Science Foundation to digitize entomological collections in museums across the United States.

Pick, along with student-volunteers Claire Najjar and Alec Weil, is capturing photos of specimens and their labels to document moth activity and distribution over the past century.

We are particularly interested in *Hypoprepia fucosa*, the Painted Lichen moth, a species on which we have contemporary data.

We want to know what moths at museums can tell us about populations over time.

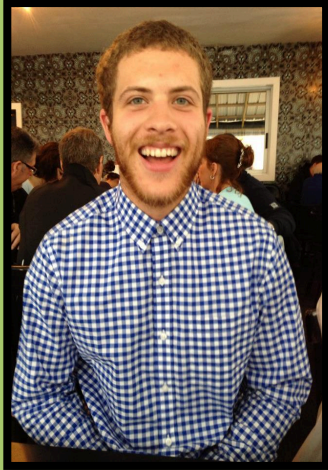
Pick visited the American Museum in New York in March and documented half the specimens of *H. fucosa* there. Claire will visit the American Museum in May to finish photographing the species.

Ultimately this project could turn into several million digital specimens on *Discover Life*.

We are looking for volunteers to go to museums to photograph *H. fucosa*. We need people to travel to museums in the eastern U.S. such as Harvard, the Smithsonian, or big collections in Florida, North Carolina, Mississippi, or Louisiana.

For information on volunteering contact Nancy Lowe at [nancy@discoverlife.org](mailto:nancy@discoverlife.org).

# STAFF PICKS: A MONTHLY EXERCISE IN CHOICE



State your name and what you do at *Discover Life*?

Cameron, "Chief Mother"—Pick

What is your favorite moth species?

*Pseudodirphia menander*

When and where did you first notice the species?

UGA Costa Rica, May 2012

Why is it your favorite? *Coloration, calm, funny*

How would you describe your moth to a "muggle" (someone outside of the science community)?

*Furry and friendly. Go ahead and touch it.*

What do you want the readers of "Life Discovered" to know about your moth?

*It makes people like moths*



State your name and what you do at *Discover Life*?

Tori Staples; I'm the "Micro Queen"

What is your favorite moth species?

*The Southern Lappet Moth, *Phyllodesma occidentalis*, has won my heart*

When and where did you first notice the species?

*In early March, I saw this guy for the first time in person, waiting on Pick's wall.*

Why is it your favorite?

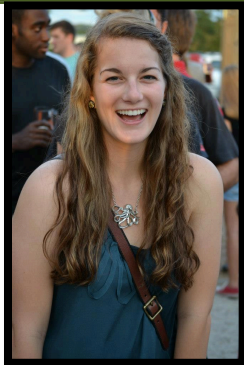
*This is a gorgeous creature! The wings are unusual.*

How would you describe your moth to a "muggle"?

*Imagine a noble creature, magical if you wish. The Southern Lappet Moth is like a tiny, red, resolved pony.*

What do you want the readers of "Life Discovered" to know about your moth?

*The Southern Lappet Moth is flying now!*



State your name and what you do at *Discover Life*:

Kyndall Dye;

*I process and identify moth photos that our moth-ers upload*

What is your favorite moth species?

*Hyles lineata, White-lined Sphinx Moth (also called a hummingbird moth)*

When/Where did you first notice the species?

*In Arizona for an internship last summer. It was feeding on the nectar of some local flowers, and I was taken aback by its speed and beautiful wing coloration. I automatically wanted to catch it and examine it!*

How would you describe your moth to a "muggle"?

*A very streamlined "cool" looking moth that looks like a hummingbird when flying; bright, eye-catching patterns on the wings, and flies during the day/evening*

What do you want the readers of "Life Discovered" to know about your moth?

*These are really cool, unique moths that most people don't even recognize as moths; they even pollinate a rare species*

If you would like to discover your favorite moth, contact Tori Staples at [tori@discoverlife.org](mailto:tori@discoverlife.org) to volunteer

## The *Beauty* and Importance of “Nothing”

**P**eter Burn, the sufferer of a Suffolk, Massachusetts winter, idly waits by lamplight each morning for signs of life.

Often no moths join him. Yet he documents his solitude religiously. As a dedicated moth observer, he understands the importance of null data.

The literature on climate change effects on species and their interactions shows many shifts in seasonal emergence times in spring. For example, in a year with an early spring or a warm winter, insects emerge earlier and are sometimes out of synch with their host plants. For this reason, we are particularly interested in FOY (First Of Year) images, to watch this seasonal timing.

We can't know if a species is FOY if we didn't see its absence before. We know it seems odd, but from a scientific perspective it's important to take pictures when there are no moths, especially now. If you have pictures of a species of moth on March 25, we know it was there then. But if we don't have any pictures on March 3-24, we have no idea if it was there, or whether you just didn't take pictures that night.

So those null data are of great importance to understand first emergences.

We at *Discover Life* ask our moth-ers for photos of their cell phone (for the date) and a light so

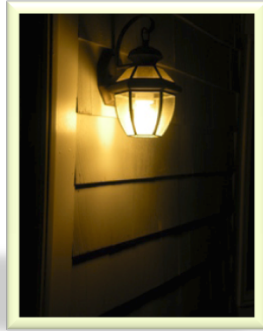


Photo by Peter Burn

that we can see there is “nothing.” If we have no photo, we have no data.

Peter Burn goes out on cold snowy nights to take pictures of his light and the fact that there are no moths. These null data are hugely important! So we are giving the “Peter Burn Award” this spring to one of our top moth-ers, dedicated enough to take pictures of no moths.

A riddle: If moths come to your light, and you aren't there to photograph them, are they really there?

Not as far as we're concerned, as scientists.

Also, if they DON'T come to your light and you aren't there to record their absence, are they really absent?

Again, no. We want to see the emptiness.

Think of it as a kind of Zen. Ah, emptiness.

## The Outer Margin

Miscellany news from the edges of our wings

### Topographical Maps and Aerial Photos added to *Discover Life.org*

*Discover Life's* Global Mapper now includes United States Topographical maps from the *United States Geological Survey* and aerial photos from the *National Agricultural Imagery Program*. At 1 meter per pixel, land managers and other users can now receive detailed data on the location of specific species.

### *Discover Life* regularly updating *GBIF.org*

*Discover Life* is now updating data on a bi-monthly basis to the *Global Biodiversity Information Facility*, a website “established in 2001 by governments to encourage free and open access to biodiversity data.” *GBIF* ([www.gbif.org](http://www.gbif.org)) houses nearly 400 million records of species occurrences in the world. Combined with data from [www.discoverlife.org](http://www.discoverlife.org), over 607,000 species are represented on *GBIF*. *Discover Life* also uses these data to provide maps to our partner *The Encyclopedia of Life* ([www.eol.org](http://www.eol.org)) and other users. *Discover Life* runs these data through an error checker to assure accuracy.

### *Discover Life* extends an Athens welcome to Larry Thompson

Larry Thompson is a bird photographer who has a phenomenal album on *Discover Life*. He will arrive in Athens, Georgia, later this month to take photos of spring warblers. He is retired but travels the world for *Discover Life*, documenting issues such as climate change and the asynchrony of birds and caterpillars. Look for a full-length article on Larry in next month's issue of *Life Discovered!*

### March use of *Discover Life* up considerably from last year!

*Discover Life* had **57 million** hits in March, twice as many as 2012. The number of users (IP addresses) increased **40%** to **445,000!** We are very grateful for what you do to make *Discover Life* grow. Without your contributions, word-of-mouth, and dedication to science, *Discover Life* could not possibly have reached this milestone. *Thank you!*

### Kyndall Dye accepted to University of KY Grad School

*Discover Life* would like to congratulate our own Kyndall Dye for her acceptance into the UK grad school in the coming fall, where she will study Public Health Entomology. She has been a vital part of the *Discover Life* family since the spring of 2012. We will miss her like a severed apex, but are excited about her new chapter!



All photos: John Pickering

# Plague of *Cissusa spadix*

## An April Legend

**A**pril reminds us at

*Discover Life* about *Cissusa spadix*—the Black-Dotted Brown moth.

Three years ago, black and brown-striped caterpillars, larvae of the Black-Dotted Brown moth, crawled all over Athens-Clarke County and more than 60 other counties in the Southern Piedmont of the United States.

They found the new leaves of giant red and white oaks and feasted. They defoliated some, which concerned foresters and ecologists alike. Yet you didn't need to be a scientist to notice the event. When they were in greatest numbers, you couldn't be outside near oak

trees without the caterpillars climbing up the walls of your house, up your pants legs, into your hair, everywhere. It was an outbreak.

Sometimes insect population booms such as these can be explained, but sometimes scientists are not sure what causes them or what causes them to end. In the case of the caterpillars of the Black-Dotted Brown moth, *Cissusa spadix*, we are still not sure about the cause of outbreak years, nor why the outbreak ended.

*C. spadix* moths hatch and emerge in late March or early April. They are members of the largest moth family, Noctuidae. They fly at night and eventually lay eggs. They hatch in larval forms as caterpillars and feed on the leaves of some oaks and hickories, among other

foliating plants. They stay as late as May before pupating in the soils beneath the trees from which they feed. They wait a year before hatching, and then start the cycle again.

Since Pick has been taking nightly photographs of adult moths in Clarke County since 2010, and uploading them to [www.discoverlife.org](http://www.discoverlife.org), we were able to find out when the adult Black-Dotted Brown moths, parents of the caterpillars, had been flying.

Pick predicted that the next year parasitic Ichneumonid wasps might fly in large numbers. Parasitoids such as Ichneumonids are insects that lay eggs in larvae or pupae of other insect species, and those parasitic larvae hatch and eat "non-essential" tissue, keeping their host

*Ichneumonid parasitoid* Photo: John Pickering

insects alive until they are finished developing. (Fans of the Ridley Scott classic *Alien* will be familiar with this behavior.) Our prediction was that parasitoids would reduce the *C. spadix* population in the spring of 2011 and there would not be another caterpillar outbreak.

Yet the next spring, in 2011, the caterpillars came back in even greater numbers, along with parasitoids, slightly early. Last year, 2012, there were large numbers of adults in early spring, but far fewer caterpillars by April. There was no *C. spadix* caterpillar

outbreak. For two springs *C. spadix* flourished seemingly without hindrance. The wasps should have knocked out the caterpillars in the second year, but they didn't. Their population didn't crash until the third year. But what caused it?

We have a hunch. Each year had been warmer than the last. As bondservants to temperature, *C. spadix* may have emerged earlier, with their emergence triggered by temperature, whereas oaks did not emerge as early since their developmental cues are more tied to photoperiod. Insect developmental cues are more tied to temperature, which is changing, and plant clocks are more tied to day length, which is not changing.

As a lad in England, Pick had a hobby of collecting butterflies and moths. At 11, he pooled together his funds and purchased a dozen silk moth eggs. At the time, he did not understand moths depend upon temperature to hatch. He kept them at

home, where it was warm—unnaturally warm for silk moths. They hatched too early. The buds on the Hawthorn trees they fed on were tightly closed. To keep the tiny caterpillars from starving, he used a razor blade to slice open tree buds, extract leaf matter, and “bottle” feed the larvae.

Recalling this experience, he suspects the culprit for the crash of the *C. spadix* caterpillar outbreak may be asynchrony—when insect and host arrive separately.

*C. spadix* caterpillars may have starved in April of 2012, but this is only a hypothesis. There are other possible explanations, too. Biological factors could also have caused the decline. Pathogens could have killed off *C. spadix* pupae before they could emerge.

To find out more about *C. spadix* and other moth species, each night this April, *Discover Life* moth-ers will wait by lamplight at their houses, at Sandy Creek, or on a wall at Myers Hall,

photograph moths, upload their images to the Discover Life website, and use the analysis graphs to look for patterns of changing seasonal emergence.

We will look through the litter beneath majestic oak and hickory trees and attempt to find those now elusive caterpillars. We invite you to join in the search—to dabble in discovery—at [www.discoverlife.org](http://www.discoverlife.org).

*A full-length article concerning this outbreak written by Dr. David Coyle, Entomologist, Warnell School of Forestry, University of Georgia, will be published later this year by American Entomologist*



*Clydonopteron sacculana*



*Mocis texana*



*Antheraea polyphemus*



*Artace cribrarius*

Photos: John Pickering

For more information go to [www.discoverlife.org](http://www.discoverlife.org)

For outreach, education, albums, and general information contact Nancy Lowe at [nancy@discoverlife.org](mailto:nancy@discoverlife.org) or (404) 272-4526

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... the newsletter, contact Anthony Sadler, editor, at [adsadler@uga.edu](mailto:adsadler@uga.edu)