TEXAS MASTER GARDENER
TEXAS A&M AGRILIFE EXTENSION
Bastrop County

What's Growing On?

BASTROP COUNTY MASTER GARDENER ASSOCIATION

May 2024

Saltmarsh Caterpillars

By Wizzie Brown

Saltmarsh caterpillars seem to be a common sight in gardens, lawns and traveling across roads and sidewalks. These caterpillars are a particular species, *Estigmene acrea*, and turn into saltmarsh moths. They are often mistakenly called "woollybears" which are a different species, *Pyrrharctia isabella*, that turn into Isabella tiger moths. The two species are related and in the same family Erebidae.

Saltmarsh caterpillars are extremely variable in color and have many setae in the late instar which creates a hairy or fuzzy appearance. They have striped or mottled bodies varying from black to brown to yellow and reaching lengths of 2.25 inches. Hairs, or setae, also vary in color and are mostly soft when touched. Hairs are not venomous and do not sting, but some people may be sensitive to the hairs.

Saltmarsh caterpillars actively disperse, and late instar larvae can be seen moving quickly across lawns, landscape beds, sidewalks, roads, and other locations. These caterpillars can move easily into areas and begin to feed on plants. Their chewing mouthparts cause damage to plants by defoliation. They have a wide host range feeding on numerous broadleaf plants including trees, shrubs, crops, and others.

Adult saltmarsh moths are medium sized and have white forewings with black dots. Hindwings are white in females and peachy yellow in males. The adult's head and thorax are white, and abdomen is peachy yellow with black oblong spots.

Pupae occur in the soil or in leaf litter. Caterpillars spin a cocoon using silk and hairs from the body. There are multiple generations each year in Texas.

Management can be as simple as removing caterpillars by hand; wear gloves while doing so. In backyard gardens, this typically is a feasible method of control. Pesticides such as *Bacillus thuringiensis* var. *kurstaki*, spinosad, or botanicals can be used against smaller stages of caterpillars (these are not as hairy as the late instars), but will not kill off late instar larvae.

For more information or help with identification, contact Wizzie Brown, Texas A&M AgriLife Extension Service

Inside this issue:

Program Specialist at ebrown@ag.tamu.edu.

This work is supported in part by the Crop Protection and Pest Management, Extension Implementation Program [award no. 2021- 70006-35347/project accession no. 1027036] from the United States Department of Agriculture (USDA) National Institute of Food and Agriculture.

Join Our Upcoming Bastrop County Master Gardener Intern Class

by Debbie Michel, Education Chair

Enrollment in the 2024 Bastrop County Master Gardener Intern Training Class opens June 1st. Classes will be August 17th through November 9th with most of the classes on Saturday from 9am – 1pm.

What are former students saying about their class experience? Ernie McCloud from the 2023 Intern Class says:

"I have always liked growing plants and the class taught me so much. We learned about bugs, pesticides, fertilizers, soil, water, parts of a plant, and propagation. One of the best things I learned was all the things I was doing wrong. A soil test is where to start. What a great group of people. I have made friends and the more experienced gardeners are so willing to share what they have learned. I enjoy sharing what I have learned with others and I think sharing information and educating others is what being a Master Gardener is all about."

Dale Weiss of the 2023 Intern Class says:

"The curriculum was top-notch and the lessons were great, but the real draw was getting to mix and mingle with all the fellow green thumbs in the neighborhood. Those classes were like a secret society of gardening geeks, and I was more than happy to be a card-carrying member. Where else could I find my people, the ones who understood the pure joy of watching your efforts grow and mature? Those classes weren't just educational, they were a gardening-fueled social hour, and I wouldn't have had it any other way. I'd walk out of those classes feeling like I could master my humble backyard plot. KUDOs to the BCMGA program!"

(*Continued on page 3*)

New Website Features

Check out our website, which features project slideshows, a new photo gallery section, and an events calendar to check out upcoming activities. Find news articles and our newsletters. https://txmg.org/bastropcounty/

(*Continued from page 2)*

Bastrop County Master Gardener Association mission statement:

> *Assist the Texas A&M AgriLife Extension Services in providing unbiased, high quality, relevant horticultural education, and service to the people of Bastrop County and the state of Texas through outreach, teaching, and demonstration projects. Protect and conserve the natural resources of the state by teaching safe, effective, and sustainable horticultural practices that promote the development of healthy gardens, landscapes, and communities. Develop a strong Master Gardener organization in Bastrop County through education and volunteer commitments.*

If you want to be a volunteer educator, love gardening, and want to protect our environment by sharing what you learn with our community, this class is for you! See the website for schedule and application. For more information contact us at class@bcmga78602.org

President's Message

by Terri Pierce

Did you know National Volunteer Week was April 21-27th? I'm a month late mentioning this, but as you know *every* week is volunteer week with the Bastrop County Master Gardeners. As an association, we are required to volunteer to maintain our certification. However, once you become involved, you soon find out that you will gain so much more than you give. Not only are you beautifying the community, you are educating, developing friendships, and learning new skills.

Here's some interesting facts.

AgriLife Extension volunteers donated almost 3.2 million hours in 2023!

Texas Master Gardeners breakdown for 2023:

TEXAS MASTER GARDENER
TEXAS A&M AGRILIFE EXTENSION
Bastrop County

TEXAS A&M AGRILIFE EXTENSION

Bastrop County Master Gardener Class

August 17, 2024 – November 9, 2024

application can be found on our website

https://txmg.org/bastropcounty/master-gardener-training/become-a-master-gardener/

The Bastrop County Master Gardener Association, a 501 (c)3 nonprofit organization, is a program of Texas A&M AgriLife Extension providing equal opportunities in its program and employment to all persons, regardless of race, color, sex, religion, national origin, disability, age, genetic information, veteran status, sexual orientation, or gender identity.

For more information contact:

Class@bcmga78602.org

(*Continued on page 4)*

Volunteering

Master Gardeners volunteer in the community to teach others about horticulture. We follow the research-based recommendations of Texas A&M AgriLife Extension. Members who complete 50 hours of volunteer service in the year after training earn the designation "Texas Master Gardener." We use our title only when engaged in Texas A&M AgriLife Extension activities.

(*Continued from page 3)*

- 7,368 Master Gardener Volunteers
- 580,049 hours of volunteer service
- $18,445,558 value of volunteer service hours
- 23,553 hours answering questions
- 54,871 pounds of produce donated to food banks
- 23,463 hours giving presentations in communities
- 135,771 hours worked in demonstration gardens

Bastrop County Master Gardeners and Interns have logged in 1,342 hours as of May 8th, 2024 and we are just getting started! This is one reason why it's important to log in your hours.

I remember how some of us were planning an upcoming event at Bob Bryant last week. You could feel the energy. One person had an idea and then someone else would build off of this idea. Before you knew it, we had agreed on a fun yet educational event for our community: *BCMGA Summerfest 2024*. All Bastrop County Master Gardeners will be encouraged to participate in this event, tentatively set for June 22nd at Bob Bryant Park.

Next time you take a minute to pull weeds, plant a flower, donate a vegetable, take that energy and share it with your fellow Master Gardeners and our community. The energy you share is contagious.

Sincerely, your 2024 BCMGA President, Terri Pierce

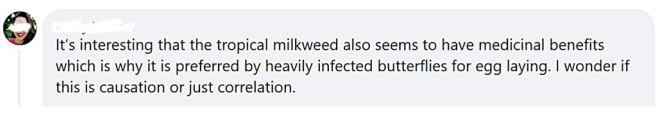
Tropical Milkweed—Vector for Deadly Monarch Parasite

by Howard Nemerov

A persistent internet myth is where somebody calls tropical milkweed (*Asclepias curassavica*) "medicinal." People base this myth on 2012 a paper published in the *Journal of Animal Ecology*, where authors discussed how Monarchs hosting on tropical milkweed had lower spore loads of the protozoan parasite *Ophryocystis elektroscirrha* (OE).

> *"In particular, parasites produced lower spore loads and caused lower virulence on monarchs reared on a milkweed species with high cardenolide concentrations (the tropical milkweed Asclepias curassavica) than on a species with low concentrations (the swamp milkweed Asclepias incarnata)."*[1]

Their words got misinterpreted to mean tropical milkweed imparts disease resistance, which is false. To begin with, "medicinal" myth supporters ignore the authors also stating that "monarch larvae were unable to avoid infectious parasite spores."



(*Continued on page 5)*

(*Continued from page 4)*

To explain why tropical milkweed is NOT medicinal, I'll draw an analogy with human immunology to define "medicinal." There is only one class of vaccines—live-attenuated—that can create lifetime immunization, according to U.S. Health and Human Services: "**Live vaccines** use a weakened (or attenuated) form of the germ that causes a disease."

> *"Because these vaccines are so similar to the natural infection that they help prevent, they create a strong and long-lasting immune response. Just 1 or 2 doses of most live vaccines can give you a lifetime of protection against a germ and the disease it causes."*[2]

The chicken pox vaccine is live-virus based, and the Centers for Disease Control and Prevention (CDC) recommends two doses for a lifetime of immunity to reinfection.[3] Another option for people like me who weren't vaccinated as a child is to get exposed as an adult. (Yeah, you get *a lot* sicker as an adult.) Another class of vaccines (i.e., subunit), stimulate an immune system response that builds antibodies, preparing you to fight off future viral infections before viral loads become extreme and cause more severe symptoms. For subunit vaccines, after an isolation and recovery period you are no longer contagious. For example, the CDC's respiratory virus general recommendation is to count five days from the time your fever ends:

> *When, for at least 24 hours, your symptoms are getting better overall and you have not had a fever (and are not using fever-reducing medication), you are typically less contagious, but it still takes more time for your body to fully get rid of the virus. During this time, you may still be able to spread the virus to others. Taking precautions for the next 5 days can help reduce this risk. After this 5-day period, you are typically much less likely to be contagious.*[4]

Their message is that after a recovery period you are **no longer contagious**. It was the same for my natural response to Chicken Pox: After isolation and recovery, my immune system had fought off the infection and I no longer put others at risk.

This is medical science: healthy immune response results in not spreading disease to others.

Returning to Monarchs, this is where the "tropical milkweed is medicinal" myth breaks down. OE-infected Monarchs that hosted on tropical milkweed may carry lower OE spore loads, but unlike the science of immune response:

- Monarchs remain sick from infection.
- Monarchs remain contagious for life.

One of my primary concerns that hopefully researchers can determine: Are these less-infected Monarchs healthier enough to fly farther and spread OE spores onto more milkweed plants than more heavily infected Monarchs? This would mean tropical milkweed produces Typhoid Mary Monarchs. There is research supporting this concept. In a 2015 *Plos One* paper, researchers found that "less heavily infected monarchs" travel farther than those with "heavier quantitative parasite loads."[5]

One final nail in this "tropical milkweed is medicinal" myth. OE is not a virus, but a parasite. Science seems clear that parasite immunity is physiologically different than viral immunity. As noted in the chicken pox example, our immune systems can build antibodies to fight off viruses; <u>it doesn't do this for parasites</u>. From a 2022 research paper published in the journal *Biomedicines*:

> *"Infectious parasitic diseases that affect humans and animals remain a central health con-*

(*Continued on page 6)*

(*Continued from page 5)*

> *cern worldwide. Parasitic infections caused by protozoans are associated with high costs in terms of human and animal health as well as direct and indirect economic loss."*
>
> *"**Discoveries in basic biology may help us to understand the molecular mechanisms** employed by protozoan parasites to survive in the host, contributing to the development of new therapeutic drugs."*[6] [Emphasis added]

In plain English: Currently, there's no therapy available creating parasitic *immunity* (creating a future auto-immune response not requiring external intervention). Though treatments address parasites after exposure, the patient doesn't automatically fight off the same parasite when re-exposed.

Is Tropical Milkweed Even More Dangerous Than Currently Understood?

Another *Journal of Animal Ecology* paper published in 2016 discussed how OE-infected Monarchs performed "medication behaviors" by hosting on tropical milkweed because of its unique biochemical properties.

> *"Upon infection by O. elektroscirrha, female monarch butterflies preferentially lay their eggs on A. curassavica, a milkweed with high cardenolide concentrations, when compared to A. incarnata, a species with low cardenolide concentrations, because cardenolides can confer antiparasitic effects to monarch butterflies."*[7]

While a cursory scan may think it supports the idea that tropical milkweed is somehow "medicinal", the truth appears more troubling. The authors noted that uninfected Monarchs that hosted on tropical milkweed didn't live as long, and fewer larva survived to adulthood.

> *"While high foliar cardenolide concentrations increased the tolerance of monarch butterflies to infection, they reduced the survival rate of caterpillars to adulthood. Additionally, although non-polar cardenolide compounds decreased the spore load of infected butterflies, they also reduced the life span of uninfected butterflies."*

For infected Monarchs that survive to adulthood, it sounds like what does not kill them makes them stronger, with apologies to Nietzsche.

[Note: Cardenolides are a class of compounds found in milkweeds; Monarch larvae consume milkweeds and ingest these cardenolides because it makes them toxic to predators. Over eons, Monarchs co-evolved with milkweeds to become immune to cardenolide poisoning, instead using it to enhance survival.[8] Cardenolide polarity affects biological activity, with "less polar molecules being more toxic." Higher non-polarity means higher cardenolide activity and effect.]

Next, authors note that this behavior increases may extend lifespan in infected adult Monarchs:

> *"[T]he most ideal medicinal plant species for monarch butterflies is one with cardenolides that are moderately high in concentration and intermediate to high in non-polarity. An example of such a species is A. curassavica, on which monarchs did experience reduced parasite spore loads, but did not suffer reduced survival."*

[Note: Authors used the term "medicinal" and *Asclepias curassavica* in the same paragraph, providing another opportunity for some to justify growing tropical milkweed by ignoring the rest of this paper's

(*Continued on page 7)*

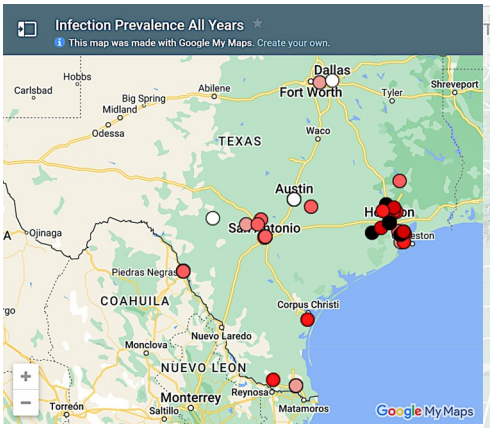
(*Continued from page 6)*

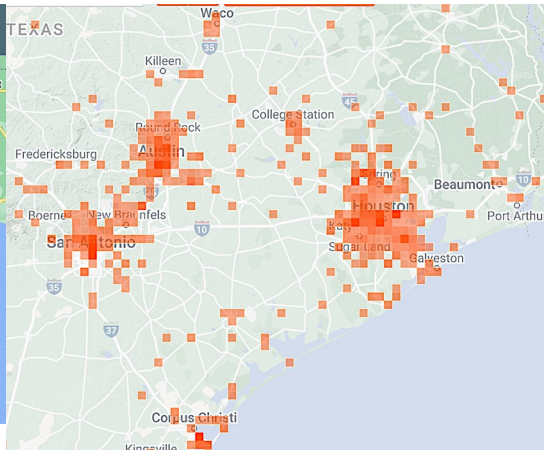
findings.]

This means OE-infected Monarchs live longer if they hosted on tropical milkweed, providing opportunity for more OE spores to disperse. Meanwhile, remember that the authors noted how uninfected Monarchs who fed on tropical milkweed as larvae may not live as long as they would have if they fed on native milkweeds.

Are we looking at this from the wrong perspective?

The graphics below show tropical milkweed correlates with OE, while this research paper indicates that infected adult Monarchs potentially spread more spores over their lifetime.[9]





Looking at this from the Monarch perspective, an equation might look like this:

Monarchs + Tropical Milkweed = Reduced OE Infection

But remember that equations balance on either side of the equal sign. Let's consider the primary objective of any species: reproduction to ensure survival. I'm going to take some poetic license because mathematics and biology may not be a perfect fit here, but let's consider the following equation from the OE perspective:

OE + Tropical Milkweed = Monarchs with Reduced OE Infection

To summarize, looking at this from OE's perspective, tropical milkweed:

- Provides a more suitable host due to its evergreen nature.
- Is an ideal vector for infecting Monarch larvae.
- Infected female Monarchs are more likely to lay eggs on tropical milkweed in an attempt to "medicate," spreading spores to create the next generation of infected Monarchs.
- Uninfected Monarchs that hosted in tropical milkweed don't live as long, effectively "taking out the competition."
- Infected Monarchs that feed on tropical milkweed have more opportunity to disperse OE spores because of greater longevity.

Authors also referenced research showing how animals express their instinctive survival mechanism when infected with parasites: "Many animals have evolved medication behaviours, whereby they use antiparasitic compounds from their environment to protect themselves or their kin from parasitism."

Looking at it from the OE perspective, has it created a way to enhance survival? By "teaming" with tropical milkweed to produce Monarchs with lower spore loads, has it created a more effective vector to spread itself? They can fly better and farther, spreading OE spores over a larger area, ensuring that more Monarch larvae get exposed and become OE hosts to spread OE even further, ***including onto native milkweeds.***

(*Continued on page 8)*

(*Continued from page 7)*

The University of Minnesota posted the same concern in 2023:

> *Why would tropical milkweed be the bad guy if it is helping butterflies avoid death by OE? The real worry is that a monarch who is only "sort of" sick with OE can spread this damaging disease more widely than if it died.*[10]

This research indicates that growing tropical milkweed is not just bad: It's zombie movie bad, and should be banned if people really care about Monarchs.

Bottom line: There is no true OE medicine for Monarchs. The only way to reduce contagion is to eradicate tropical milkweed and euthanize infected Monarchs.

Endnotes

[1] Lefèvre, Thierry et al. "Behavioural resistance against a protozoan parasite in the monarch butterfly." *Journal of Animal Ecology*, Volume 81, Issue 1, January 2012, pages 70–79. https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/j.1365-2656.2011.01901.x
[2] "Vaccine Types". U.S. HHS: https://www.hhs.gov/immunization/basics/types/index.html
[3] "Chickenpox Vaccination: What Everyone Should Know," CDC: https://www.cdc.gov/vaccines/vpd/varicella/public/index.html
[4] "Preventing Spread of Respiratory Viruses When You're Sick." Centers for Disease Control and Prevention. Accessed May 14, 2024. https://www.cdc.gov/respiratory-viruses/prevention/precautions-when-sick.html
[5] Altizer, Sonia et al. "Do Healthy Monarchs Migrate Farther? Tracking Natal Origins of Parasitized vs. Uninfected Monarch Butterflies Overwintering in Mexico." *Plos One*, November 25, 2015. Accessed February 3, 2024. https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0141371
[6] Pereira MA, Santos-Gomes G. Parasitic Infection and Immunity-A Special Biomedicines Issue. Biomedicines. 2022 Oct 12;10(10):2547. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9599367/
[7] Tao, Leiling et al. "Fitness costs of animal medication: antiparasitic plant chemicals reduce fitness of monarch butterfly hosts." *Journal of Animal Ecology*, Volume 85, Issue 5, September 2016, pages 1246–1254. https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/1365-2656.12558
[8] "Why Milkweed"? Monarch Joint Venture. Accessed May 15, 2024. https://monarchjointventure.org/monarch-biology/why-milkweed
[9] Graph sources: "Monarch Health." Accessed February 21, 2024. https://www.monarchparasites.org/maps
Tropical Milkweed Observations, iNaturalist. Accessed February 21, 2024. https://www.inaturalist.org/observations?place_id=any&subview=map&taxon_id=75602
[10] Bugeja, Shane and Weisenhorn, Julie. "Is tropical milkweed bad for Monarchs?" University of Minnesota Extension, April 25, 2023. Accessed May 14, 2024. https://extension.umn.edu/yard-and-garden-news/tropical-milkweed-bad-monarchs

Huron Sachem (*Atalopedes campestris*) on *Dianthus*

by Howard Nemerov

Grow it, and they will come! I'm trialing Amazon Neon Duo Dianthus and it proved to be a pollinator magnet. This new visitor to my garden is a member of the Skipper family, attracted by a new flower.

TEXAS MASTER GARDENER
TEXAS A&M AGRILIFE EXTENSION
Bastrop County