June, 2017

Issue 17

MONARCH JOINT VENTURE

MonarchNet News
A Citizen Science Newsletter

Upcoming Events

- MLMP trainings are coming up in Iowa, Minnesota, and Colorado! Visit monarchlab.org/mlmp/training/attend to sign up!
- Join the MCSP Integrated Monitoring Strategy! Find out more and register: monarchjointventure.org/news-events/events

Photo: Whorled milkweed, Janet Allen

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Cover photo: Candy Sarikonda

Ancient Milkweed and Termite Pollinator Discovered!

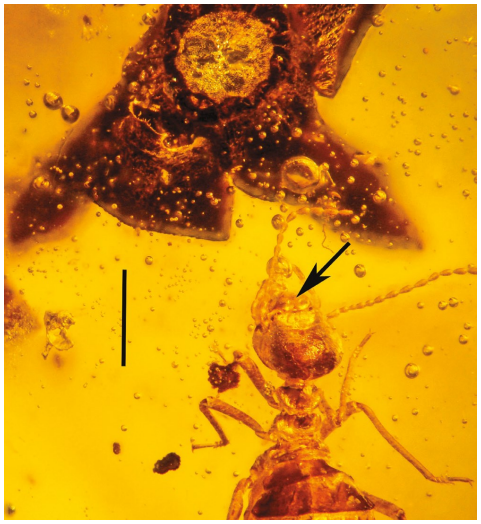
"The fossil termite adjacent to the milkweed flower in Dominican amber carries pollinia that match those found in the stigmatic cavity of the flower, thus establishing termites as pollinators of ancient lineages of the Asclepiadoideae in the mid-Tertiary." (Poinar, 2017)

Pollination can be performed in a variety of ways. Butterflies, bees, hummingbirds, bats, and even wind can aid in this process. Milkweed, the only host plant for the monarch, is pollinated by a variety of pollinators. A recent discovery shows us that termites were once milkweed pollinators too! George O. Poiner Jr. observed an ancient harvester termite (Order Isoptera, Family Termitidae) carrying pollinia of the first discovered fossil milkweed flower in Dominican amber (2017).

Plants have different ways of distributing their pollen. In this case, we see the pollen attached to the termite in little sacs, also known as pollinia. Only two major plant families distribute their pollen this way, orchids and milkweed. To distinguish the pollinia in the two families, we can look at their structure. The pollinia attached to the termite embedded in the Dominican amber resemble those of milkweed. It has a generally rigid structure called the corpusculum that attaches to the pollinator.

This discovery is remarkable, considering there is no known association between termites and milkweed today. In his recent article, Poinar explains that some termites do visit flowers, most likely for nectar. This occurs regularly with the Australian harvester termite and the orchid species *Rhizanthella gerdeneri*.

This important discovery brings up questions as to whether or not this association still exists between milkweed and termites. Termite foraging behavior is difficult to study, but future work will help us better understand this relationship, and if it persists today.



Right: Forager termite adjacent to the flower of Discoflorus neotropicus gen. & sp. n. in Dominican amber. Arrow shows location of pollinia attached to termite head. Scale bar = 0.8 mm. (Poinar, 2017).

Poinar, G.O. (2017). Ancient Termite Pollinator of Milkweed Flowers in Dominican Amber. American Entomologist. 52-56.

Featured Citizen Science Project: Western Monarch Milkweed Mapper

MonarchNet Spoke with Candace Fallon, Xerces Society Senior Conservation Biologist and project lead for the Western Monarch Milkweed Mapper about this new western monarch citizen science project! Learn more about the WMMM here.

MonarchNet: How did the project start?
Candace Fallon: Xerces has been mapping monarch and milkweed occurrences for the last 6 years or so, and while working with Region 1 of the US Fish and Wildlife Service, we identified some major data gaps in the west, especially in the arid west. We were curious about the status of monarchs and their breeding habitat in these data gap regions, and thought the deficiency of data had more to do with limited human populations in those areas rather than a lack of monarchs or milkweed. But we had a major limitation: How could we collect high quality data over such a huge geographic area? The idea for an online mapper and data portal came about through a collaboration between the Xerces Society, the Idaho Department of Fish and Game, and the Washington Department of Fish and Wildlife, with funding from a U.S. Fish and Wildlife Service State Wildlife Grant and the National Fish and Wildlife Foundation. It's actually part of a much larger project to compile historic occurrence data, coordinate state monitoring efforts, and provide educational workshops.

MonarchNet: What is the primary goal of the project?
Fallon: Our primary goal is to determine where monarchs and milkweeds occur in the West. To do this, we are asking citizen scientists, researchers, and land managers to contribute observations of milkweeds and monarchs in 11 western states. This can be done using an app in the field, or by uploading photos and observations to our website. The data collected will improve our understanding of the distribution and phenology of monarchs and milkweeds, identify important breeding areas, and help us better understand monarch conservation needs. At the moment, we're using the data to improve habitat suitability models and inform state wildlife action plans.


Photo: Gail Morris

MonarchNet: Have you had any exciting monarch observations yet?
Fallon: The website launched this year, so we're just starting to get sightings reported for 2017. However, Xerces, our partners, and many other groups have been conducting targeted surveys for western monarchs and milkweeds over the last couple years, data from which are now available through the WMMM website. Some of the data gaps we identified in the arid west are starting to get filled in, and we're discovering that places like Nevada and Idaho actually support substantial numbers of breeding monarchs each summer, which was previously undocumented.

MonarchNet: What have been some challenges you have had to overcome and what did you learn from them?
Fallon: Balancing the many different perspectives and data interests of everyone involved with a collaborative project like this has been an interesting challenge. Beyond the core group of partners working on this project, we solicited feedback from different teams of data contributors and data users and tried to distill everyone's ideas into the website you see today. It was a great experience thinking about how a project will be used by so many different audiences. Are we collecting the right types of data to answer key research questions? Are we providing the right educational tools? Are we storing and disseminating the data in the best possible way? There will always be room for improvement, but I think the project has a solid foundation, thanks to our beta testers and other advisors.

MonarchNet: What inspires you or the organizations involved in the project to continue doing this work?
Fallon: It's all too easy with wildlife conservation to broadcast gloom and doom, but we need a different approach if we're going to enlist the all-hands-on-deck approach that is so critical to conservation success. There's something about monarchs that ignites people's imaginations and inspires action. So much of what we know about monarchs is a result of curious and passionate people donating their time and energy to a common cause. In the west we have a unique opportunity to answer some pretty fundamental questions about monarchs: Where do they go after they leave the overwintering sites? Where are they breeding? What milkweed species are they using? We've made a lot of discoveries over the last 20 years, but there's still much to learn about what this species needs to survive. And there are a lot of people, from teachers and research scientists to farmers and land owners, who are stepping up to that challenge. It's really heartening to see that kind of response, especially for an insect!

Find out more about the Western Monarch Milkweed Mapper here! https://www.monarchmilkweedmapper.org/

The Monarch Conservation Science Partnership Integrated Monitoring Strategy

The Monarch Conservation Science Partnership (MCSP) is a group of scientists and conservation professionals from government, academia and NGOs. They have been working together since 2009 to model monarch population trends, assess the impact of threats, establish population targets and habitat goals, and develop conservation tools to guide conservation decision-making. Many of these products and tools depend on citizen scientists. Monarchs have been the focus of a rich array of citizen science and other monitoring programs for decades. Together, these monitoring programs offer a collective portrait of monarch biology and population health and have made significant contributions to monarch science (Ries & Oberhauser, 2015). However, with the dramatic decline of the monarch population in recent years, more monitoring data are needed for two reasons:

1. Spatially representative data are needed to improve models so conservation efforts can use the limited resources available to have the most possible impact. People frequently monitor high quality habitat where they are likely to encounter monarchs, making extrapolating information across the U.S. landscape difficult since high quality habitat is not present everywhere.
2. As conservation actions take place, ongoing monitoring can help determine if these actions are having the desired outcomes.

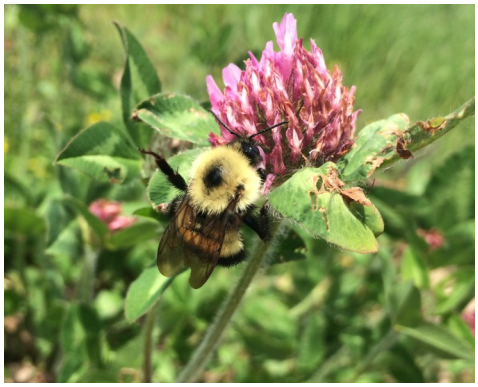
The Integrated Monitoring Strategy (IMS) is a way to address these challenges, and your participation is needed! The IMS allows us to monitor key monarch and habitat characteristics using spatially balanced sites across the monarch's U.S. range. Your results will inform Eastern monarch population habitat targets, help scientists understand the threats monarchs face during the breeding season, and help to create strategies for implementing habitat enhancement. Combined with habitat management records over time, these data could also be used to assess the effectiveness of local conservation projects for monarchs.

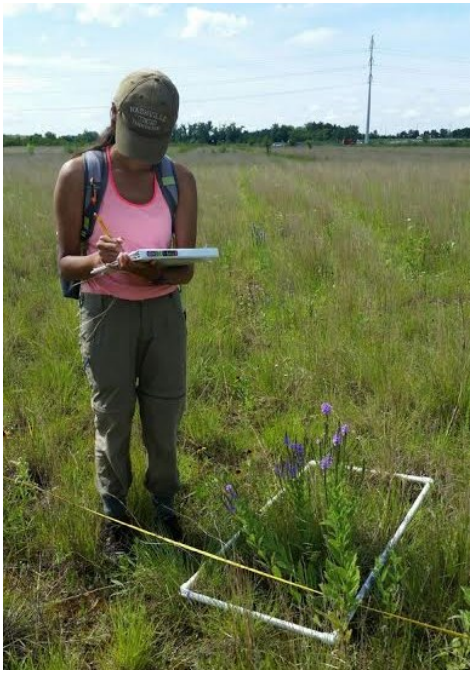
The Integrated Monitoring Strategy consists of four activities:

1. Monitor adult monarchs and identify preferred adult nectar plants.
2. Estimate milkweed species diversity and density, per plant density of monarch eggs and caterpillars, and relative abundance of blooming nectar plants.
3. Estimate monarch survival to adulthood by raising collected monarchs.
4. Estimate abundance and biomass of fire ants (where geographically appropriate).

Register for a free training in Michigan or Wisconsin this summer to learn how to monitor! Register here. A monitoring coordinator will provide a list of priority (public) sites near you. Priority sites are where monitoring is most needed, but you may also monitor a site of your own choice. You can also choose which activities to do. While doing all activities is encouraged, it is not required!

This is the second year of the project, and your contributions this year will help the MCSP to implement and improve the project in the future. With help from people like you across the U.S., we will be able to address important gaps in our knowledge about monarchs and their habitat!





Register for an IMS Training

Free trainings are being held in Wisconsin and Michigan, space is filling up fast!

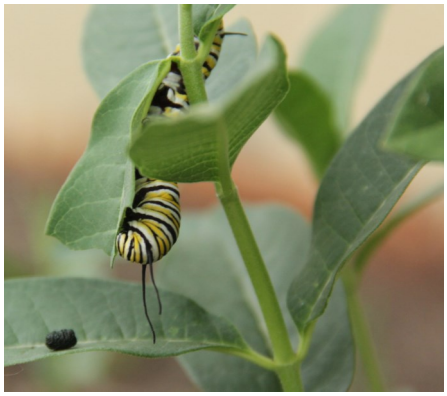
Michigan : Fenner Nature Center, Lansing, June 10th & 11th.

Wisconsin: UW Madison Arboretum, June 24th & 25th.

Register today:

https://tinyurl.com/mcsp-monitoring

Photos: Kyle Kasten, Laura Lukens, Wendy Caldwell



Share your ideas!

Are you are a butterfly citizen scientist with a story, photos, or artwork to share? Would you like to nominate a volunteer or program for recognition in the newsletter? Write to us at *mjv@umn.edu* with your ideas.