Moths: Food Chain Foundations

by Danae Wolfe

MOST PEOPLE think of moths as drab gray or brown insects that fly erratically and obnoxiously around porch lights. While some moths are indeed brown or gray, many more offer a mosaic of dazzling colors and stout, fuzzy bodies that even the cutest of teddy bears would envy. What's more, moths play an important role in maintaining the health and integrity of local ecology.

WHY MOTHS MATTER

Moths are often written off as little more than agricultural and horticultural pests. After all, moth larvae—or caterpillars—are among the best-known insect feeders of foliage, fabric, and even pantry staples like flour and grains. But like many insects, only a fraction of the total known species of moths are true pests.

Birds, bats, reptiles, small mammals, and other insects feed on moths in their larval and/or adult forms. For birds in particular, moths offer a vital food source without which many species of our feathered friends would be unable to rear their offspring. Sometimes called nature's hot dogs, caterpillars—including those of moths—provide the perfect mix of fats and proteins that baby birds need to grow and develop. A single clutch of Carolina chickadees might consume upwards of 9,000 caterpillars before fledging. Imagine how many it takes to sustain entire populations of birds.

In addition to providing fundamental food sources for other wildlife, moths can also pollinate flowers and food crops. Recent research suggests moths are important nocturnal pollinators, visiting night-opening flowers (an example of insect/plant co-evolution). In some cases, moths might be the only pollinator helping some plant species thrive. Native to the southwestern United States, yucca moths *(Tegeticula* spp.), are the only pollinator for the Joshua tree *(Yucca brevifolia)*, and yucca moth caterpillars feed only on the seeds of this plant, creating an important symbiotic relationship in the Mojave Desert.

A tiny yucca moth *(Tegeticula* sp.) blends into the white petals of a yucca flower. In the Mojave desert, yucca moths are the sole pollinators of the Joshua tree *(Yucca brevifolia)*.

Through this lens, we can begin to understand the importance of stewarding landscapes in ways that support insects like moths.

MOTHS VS. BUTTERFLIES

Like butterflies, moths are in the insect order Lepidoptera and undergo complete metamorphosis in four life stages: egg, larva, pupa, and adult. Moths range in size from just a few millimeters to about 12 inches and come in a variety of colors. Some even have patterns that mimic other animals, including wasps, jumping spiders, and snakes.

But unlike butterflies, moths are far more biodiverse. All told, there are around 825 species of butterflies in North America. Moths, however, reach somewhere around 12,000 known species. Compared to their daintier relatives, moths generally have stouter and hairier bodies and distinctive feathery antennae. In some species, males boast more plumose antennae for the purpose of sensing female pheromones. Some male moths have been known to track down females 30 miles away by following their scent trails.

A major behavioral difference between moths and butterflies is their period of activity. Butterflies take flight during the day, while moths are generally nocturnal, flying under cover of night.

MEMORABLE MOTHS

It would be impossible to introduce you to all the beautiful moths in North America, but I'd like you to meet a few of my favorites. Giant silk moths—also called saturniids—are so named for the fine silk they used to construct their cocoons in the pupal stage of their life

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and include some of the largest and most colorful moths in the world.

Here are four noteworthy giant silk moth species along with their geographic range and preferred host plants. If you're mindful about including host plants in your landscape, you might be lucky enough to catch a glimpse of one these beautiful animals in your own garden!

LUNA MOTH *(Actias luna)* Luna moths are one of the most easily recognizable giant silk moths thanks, in part, to their mint-green wings, which span 3 to 4.5 inches. Both forewings and hindwings have characteristic eye spots. Forewings are bordered by deep shades of maroon or brown; hindwings extend downward in twisting tails.
Range Temperate deciduous forests in central and eastern United States.
Host plants Northern populations often feed on white birch while southern populations feed on walnuts, hickories, sumac, sweet gum, and persimmon.

Luna moths, so named for the moon, are ethereal creatures with mint-green wings and bright yellow antennae.

ROSY MAPLE MOTH *(Dryocampa rubicunda)* It's hard to imagine a cuter insect than the rosy maple moth. Often decorated in shades of hot pink and yellow, it is the smallest giant silk moth with a wingspan of just 1.25 to 1.75 inches.
Range Temperate deciduous forests and surrounding urban and suburban environments in the eastern United States.
Host plants Red, silver, and sugar maples.

IO MOTH *(Automeris io)* Medium-sized moths with wingspans of 2.5 to 3.5 inches, io moths are easily recognizable by their prominent hind wing eye spots that resemble owl eyes. Males bear bright yellow wings, bodies, and legs, while females are reddish brown.
Range Temperate deciduous forests, thorn scrub, and surrounding suburban areas in parts of central and eastern United States.
Host plants Maples, hickories, redbuds, cherries, elms, among others.

The rosy maple moth is easily recognizable by its bright pink-and-yellow wings and bodies, though coloration can vary from more cream to nearly all white.

CEANOTHUS SILKMOTH (*Hyalophora euryalus)* These large moths have reddish-brown wings and orange-and-white striped bodies. Forewings have eyespots at the tip; hindwings boast white spots that resemble long pointed commas. Wings are bordered by wide bands of color in shades of purple and pink.
Range Coastal areas, chaparral, and conifer forests in the western United States including parts of Montana, Washington, Oregon, and California.
Host Plants Buckbrush, manzanita, gooseberry, madrone, willows, alder, and mountain mahogany, among others.

Resources

Moths: A Complete Guide to Biology and Behavior by David Lee and Alberto Zilli, Smithsonian Books, 2019.
Peterson Field Guide to Moths of Northeastern North America by David Beadle and Seabrooke Leckie, Mariner Books, 2012.
Peterson Field Guide to Moths of Southeastern North America by Seabrooke Leckie and David Beadle, Mariner Books, 2018.

HOW TO BECOME A LOVING MOTH-ER

Like many insects, moths are experiencing population declines due to pesticide use, habitat destruction, and light pollution. among other factors. Fortunately, gardeners can easily help support moths and other insects. Here are a few tips to get started:

- Plant native! Since many moths are specialists, feeding only on specific plants, incorporating native host plants is one of the most important factors in attracting and supporting moths in the garden.
- Reduce or eliminate pesticides to ensure moths and their caterpillars can thrive in your landscape.
- Eliminate unnecessary light pollution. Artificial lighting at night can disrupt how moths orient themselves in the environment.

I encourage you to take a closer look at the often overlooked moth. You might be surprised to uncover intricate patterns, shimmering scaled wings, and unparalleled insect charm.

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