

Observations of a Butterfly Gardener

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Introduction

It may be a luxury to have time to look, and to listen. Take 15 minutes and treat your mind, body, and soul to a garden walk, or find a quiet place to sit outdoors. What do you see? What do you hear? Nature has many delightful surprises in store for you. Absorb what is there. Besides tranquillity, you will discover all kinds of sights and sounds that have gone unnoticed.

This presentation is all about observation. Come, take a trip with me into my garden and discover the wonderful world of butterflies.

Life cycle

Butterflies have four stages to their life cycle: egg, caterpillar (larva), chrysalis (pupa), adult (butterfly)

Egg 4 - 7 days

Most butterfly eggs hatch in 4 - 7 days. When the egg of the Eastern Black Swallowtail begins to darken, use your mini microscope to see the tiny caterpillar move inside the egg. Then look closely as it consumes the eggshell. The first order of business for the tiny larvae is to consume the eggshell. They then become eating machines for about 2-4 weeks. Eating is interrupted only by the molting process, which occurs 4 or 5 times.

Molting

The skin of the caterpillar does not grow. Therefore after several days of eating, the caterpillar will molt. Before each stage in the life cycle, there seems to be a period of rest, where the caterpillar is completely inactive for several hours. You may perhaps even think it is dead. If you watch periodically, you might see the actual process. The caterpillar begins to contract, (Molting takes about 30 minutes) eventually slipping out of the skin, much like shedding a sock, leaving the skin behind. The caterpillar "hardens off" after each molting, consumes the skin, and then another eating marathon begins until the next molting. Generally, caterpillars do not roam off the food source - an observed exception is the Spice Bush.

Purging

When the caterpillar has finished its last meal, it will then leave the food source, constantly roaming. This may last for up to 18 hours. During this time it will purge, seeming to rid itself of extra fluids and solid waste. It usually is a greenish black liquid. Again this will be another indication of change in the life cycle. It will continue to roam and then will find a suitable protected place to form a chrysalis. Of all butterflies we have raised, only the swallowtails purge.

"Its Place"

When it finds "its place" it will crawl back and forth slowly creating 2 fine but tough buttons of webbing, one for the abdomen to attach, and one for the sling at the top of its body. (Monarchs and American Painted Ladies suspend themselves at a single point.) When the abdomen of the caterpillar is firmly attached, it will create the sling by stretching a silken thread from the twig or branch, behind its head and attach it close to the first thread. The caterpillar then appears to go into a dormant stage, resting, head and abdomen appearing to hug the branch. Suddenly after a time, it begins to twitch and convulse dropping back in the sling for about 12 hours.

Chrysalis 5 - 24 days

After about 12 hours (give or take) slight contractions occur. A spectacular event is about to unfold. Before your very eyes, this caterpillar will split the skin down the back, much like a zipper, shed the skin and be a chrysalis within 2 - 3 minutes. It wriggles and jiggles fiercely for a bit, pumping the chrysalis to its final shape. The chrysalis is very sensitive to touch for several days. The final skin from what was a two-inch caterpillar is only half the size of a pencil eraser.

The average time of the pupal stage or chrysalis is up to 24 days, however there are exceptions. For example, in April 1996 an Eastern Black Swallowtail, which I raised from an egg, emerged from its chrysalis after 296 days.

Butterfly 2 - 4 weeks

As in all other stages, there is a visible sign when the butterfly is ready to emerge from the chrysalis. Up to 18 hours before, the chrysalis will change color and become dark. They usually emerge in the mornings benefiting from the warmth of the sun to aid the drying of the wings. The skin of the chrysalis will split, sounding like a dry crackling leaf. Within one minute the butterfly is free, the abdomen much distended with fluid upon emergence. The fluid is pumped from the abdomen into the crumpled wings, expanding them to full size. Upon emergence, the wings appear to be wet and cannot open, just limply flop. The butterfly will crawl a short distance upward, allowing the wings to hang freely, not touching any surface, until completely dry.

Predators

All stages are vulnerable to predators. Predators of eggs and butterflies are spiders. If you can find the spiders, you can relocate them (with a 10 ft. pole). Some have ability (crab spiders) to camouflage themselves the plant color. Other butterfly predators are praying mantis and Japanese hornets. Predators of caterpillars are wasps. Predators of chrysalis are ants and spiders. About 200 of a thousand eggs reach maturity.

Defenses

Caterpillars of some species display osmeteria when irritated. The osmeterium is a "V" shaped organ behind the head. When disturbed, the osmeterium is displayed, along with emission of a foul odor. Some caterpillars "freeze", others roll into a ball. The Spicebush has eyespots on the back of the head and upper body. When disturbed it arches the upper body and the prominent eyespots startle and deter predators.

Size

Butterflies of the same species may vary in size and coloring depending on food supply and generation. All growth takes place during the larval stage - thus a small butterfly has been and always will be small; large butterflies have been and always will be large.

Puddling

In mating, the male also passes nutrients as well as sperm to the female. These added nutrients may aid the female in egg production. Males, most commonly Tiger Swallowtails, but also Monarchs puddle to replenish these nutrients.

Temperature

Butterflies need a temperature of at least 70 degrees to fly. I have seen butterflies flying at temperatures of about 60 degrees if the day is sunny. Keep your eyes peeled. You may be in for a delightful surprise.

Monarch

Monarchs live about 3 - 4 weeks except for the last generation, which are non-reproductive and live 10 months. This generation migrates from as far as Canada and can fly up to 200 miles per day and go up to 20 mph. Those west of the Rockies migrate to California; those east of the Rockies migrate to Mexico. There they spend the winter at near freezing temperatures until spring. At this time they develop reproductive organs, mate, lay eggs and die, their offspring continuing the migration to the North.

Woodland Butterflies

Besides the butterflies that dine in your perennial patch, there are woodland butterflies. They prefer sap flows, dung, and fermenting fruit. These butterflies are generally not flashy or brightly colored. They are shades of tan, brown, and rust. Upon resting they are almost impossible to detect, due to camouflage. We have identified 8 woodland species and attracted 3 with fermented fruit.

Overwintering

Butterflies can overwinter in the egg, caterpillar, chrysalis and adult stage - called diapause or hibernation. Mourning Cloak overwinters as a butterfly, and may be seen on warm days in very early spring.

Host Plants

Females have taste pads on their feet that allow them to know the proper plant; they can scratch the surface of a plant to detect if it is the proper host plant for her larvae. The host plants contain chemicals and nutrients specific to the growth and development of the caterpillar. Host plants can be trees, shrubs, flowers, or grasses.

Attracting butterflies

While most species of butterflies are host plant specific, they have a wide variety of favorite nectar plants. They are attracted by fragrance and a mass of color rather than a flower here and there.

They also prefer simple flowers rather than double.

Nectaring is the least studied aspect, so you may experiment to find preferred flowers for your area. We went to the Blue Ridge Parkway in Virginia, and saw butterflies fighting over thistle, and going bonkers over ironweed and snakeroot. I ordered some of each for our garden. The thistle attracted some butterflies briefly, and then they flew off to the butterfly bush.

Some flowers produce more nectar than others. In the mountains where there was no butterfly bush, the thistle was favored, but in the cultivated garden it took second place. Ditto for ironweed and snakeroot.

Be sure to plant host and nectar plants to attract many species. If you live in a wooded area, learn to identify some of the woodland trees and shrubs. You may very well already have host plants.

Butterfly House

Someone has made lots of money on this one. At the NC Zoo, it's a good icebreaker for visitors and a cute garden ornament, but not good for butterflies. One year a spider found residence there. The next spring, there was a spider, a live wasp hive, and a chrysalis trapped and eaten in another web. If you wish to keep them as a garden ornament, staple a piece of screen or black nylon net on the inside of the slotted panel.

Wedding Releases

The butterfly trade is rapidly growing with some dealers transporting up to 800 butterflies a week, at a charge of up to \$100 per dozen. There is much debate between breeder/businessmen and scientists about commercial butterfly releases. The most serious threat is the potential rapid spread of disease to the wild populations. Parasites are present in natural populations, which are not a problem until there is captive breeding at high densities in close quarters. If monarchs are raised inside under unnatural conditions, it is possible that their migratory physiology may have been altered. Some caterpillars are raised on drugs that can suppress diseases caused by protozoa and bacteria but not eliminate them. When the apparently healthy butterflies are released, they can act as carriers, spreading disease.

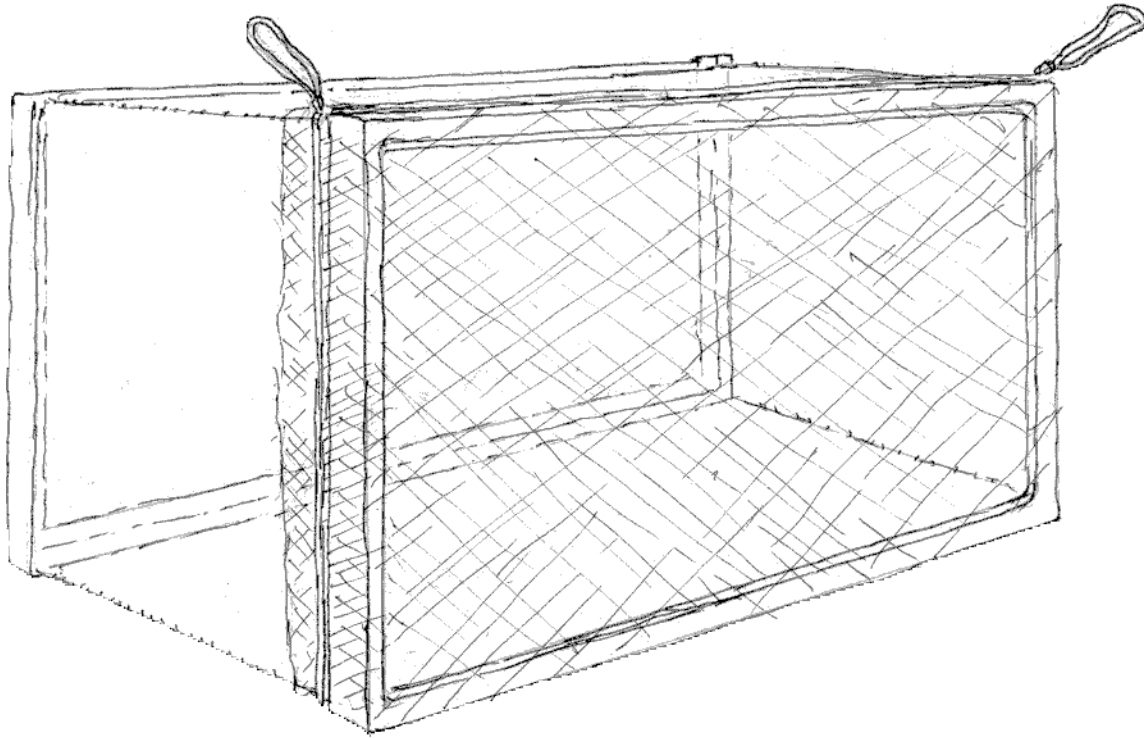
Businessmen argue that if diseases are detected they are destroyed. They point out that there is no solid data to show damage to wild populations. However, scientists are especially concerned about possible spread of *Ophryocystis elektroscirrha*, a parasite found in commercial and wild monarchs. To date, they are uncertain as to how much it contributes to the death of the wild population. The parasite doesn't show up for several generations, so diseased butterflies may indeed have been released before discovery of the parasite.

Raising Butterflies Indoors

The day prior to plummeting temperatures, I found two Painted Ladies (on Everlasting). Not knowing what freezing temperature do, we brought them inside. We also wanted to see if they would pupate and overwinter as a chrysalis, or complete the metamorphosis. They completed metamorphosis, and lived on a diet of pineapple orange juice. They lived 18 and 21 days, their normal life cycle.

If you know the host plant, you may find butterfly eggs. Bring in the cutting and place in a vial used by florists. They resemble test tubes with caps. It is important to cap any container, or the caterpillar may drown. Replenish the host plant as necessary.

You can find aquariums to be inexpensive if the water seal has been broken. Nylon tulle, or bridal veil, affords the best visibility as the cover to the aquarium. Cut tulle about 5 inches longer and wider than the opening. Measure narrow elastic to fit around the edge of the aquarium, over the tulle, just beneath the outer ledge. Glue tulle and elastic in place on the outside of one of the longer sides of the opening. When glue is dry, place aquarium on its side, using glue secured side as the floor. This greatly facilitates cleaning, replenishing food supply and removal of caterpillars for photo sessions. The tulle is pulled up over the opening and held in place by the elastic.¹ A broken tip of a dogwood branch in the aquarium adds more crawl area for the roaming caterpillar once it has left the food source, although it may not use the branch as “its place”.



¹ Elastic must fit securely around glass. Tighten by making a loop at each corner. This gives handles for ease in finding the elastic. See illustration.