

## Loretta Shigo: Trailing the monarchs

# *Danaus plexippus* – getting to know you

The monarch, *Danaus plexippus*, Order Lepidoptera, is a milkweed butterfly belonging to the class of animals known as insects.

All insects have six legs and a segmented body composed of three parts: head, thorax, and abdomen. All butterflies and moths undergo a complete metamorphosis. Butterfly and moth juveniles are called larva or caterpillars. There are profound differences between the larval state of an insect and its adult form.

Now for some caterpillar biology. A caterpillar has a head, thorax and abdomen with 14 jointed parts called segments. On the head there are 12 small eyes called ocelli, six on each side and mouthparts for munching milkweed. The thorax has two front tentacles and six legs called true legs, three legs on each side.

The abdomen is made up of the remaining eight segments. Five segments sport pairs of false legs or prolegs. There are 10 legs total, five on each side. At the bottom of the prolegs is a small hook called a crochet. This hook helps the caterpillar hang on to whatever it crawls on. The last three segments are joined together. Bringing up the rear is a pair of shorter tentacles.

Let us follow a just-hatched caterpillar. Since its mouthparts are tiny, the second meal after eating its eggshell will be the small hairs on the underside of the milk-

weed leaf. Remaining there for a few days it will eat these hairs until it takes its first bite of the leaf. The caterpillar will get its colors, the familiar white, black and yellow stripes, as it continues to munch the leaf.

The caterpillar eats and grows rapidly, shedding its skin or molting four times before reaching a length of two inches. The stages in between molts are called instars. The fifth instar is the last stage of the caterpillar's life. At this point it goes on a walk-about looking for a safe place to spin a silk button. After hooking its back feet into the button the caterpillar hangs upside down, curling its head so that it looks like the letter "J."

It hangs for about 12 hours until the front tentacles go limp signaling that the final molt called the "pupa dance" has arrived. The skin splits behind the head and the emerging pupa wriggles as its skin slides up its body, finally reaching the top where a stalk that has tiny hooks on it called the cremaster, attaches to the silk button. The skin falls off as the pupa wiggles a bit more and then becomes quiet.

Dramatic changes already have taken place as the pupa shrinks in size. The outside skin hardens; gold dots appear. During the next 12 to 14 days, the caterpillar's body parts completely change and re-form into the organs and wings of a butterfly. If you look closely

at the pupa as it is dancing, you can see the wing buds, head, proboscis, and antenna of the soon-to-be butterfly. The pupa does not move or eat inside the chrysalis. On the day before the butterfly is to emerge, or eclose, the chrysalis turns black and you can see the familiar orange, white and black wing colors through the transparent skin.

The now fully developed monarch butterfly pushes on the doorway with its feet. Slowly the door opens and the butterfly drops out head first, holding onto the papery chrysalis with its feet or tarsi. Hanging upside down the butterfly adjusts and re-adjusts its hold on the papery surface and starts to pump fluids stored in the chubby abdomen into the capillaries in the wings expanding them. Right now the wings are damp and fragile. As they slowly expand the butterfly will hang upside down until the wings stiffen and dry.

The whole emergence and expansion process takes about 30 minutes. Before you know it, there is a damp, gorgeous, full-size butterfly hanging before your eyes. Now it will rest for a few hours. It is most vulnerable at this time, as the wings would crumple and dry before becoming fully expanded should a strong breeze or a predator knock it down. If it is a sunny day with the temperature above 60 degrees, the butterfly will fly off in



*The monarch in the caterpillar stage.*

search of its first sweet nectar meal. Maybe your garden will be where it finds that first sip.

Future articles will feature amazing egg, pupa and butterfly biology; tips for locating and caring for caterpillars; milkweed seed collecting and more. Until then – be part of the journey – plant milkweed.

Visit [monarchjourney.com](http://monarchjourney.com) or [monarchjourney.blogspot.com](http://monarchjourney.blogspot.com) for nectar and host plant lists; time-lapse photography of the pupa dance and emerging butterfly, program information and more.

*Loretta Shigo is a resident of Buckingham. Contact [info@monarchjourney](mailto:info@monarchjourney) or 267-614-3609.*