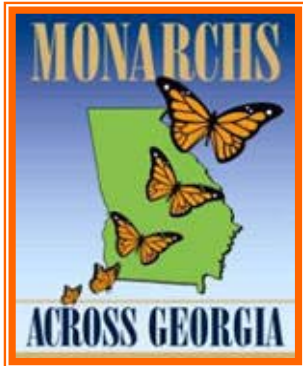


Monarchs Across Georgia Newsletter

Spring, 2005
Volume 1, Issue 2

An Initiative of the Environmental Education Alliance of Georgia
www.eealliance.org



Upcoming Events

July 4

North American Butterfly Association Butterfly Count 2005. Visit www.naba.org for more information.

July 30

"How to Create a Butterfly Garden" presentation at Canton Senior Center from 10 AM - Noon. Free. For details contact Karen at kgarland@gaconservancy.org

October 14

Outdoor Classroom Symposium, Frey Elementary School, Cobb County. Visit www.eealliance.org for more information.

February 25 - March 4 2006

MAG is traveling to Mexico and is looking for donations of school supplies to give schools. Contact MAG on how you can help.

Our Mission

To engage schools and families in learning experiences involving monarchs and other native butterflies. The MAG program promotes stewardship of the natural environment through multi-disciplinary exploration and scientific investigation.

Milkweed Magnetism

by Karen Garland

Fluttering and gliding above the fragrant blossoms, the adult butterfly sips the flower's sweet nectar. Then, when the time is right, the female monarch begins looking for milkweed plants to begin laying her hundreds of tiny, creamy white eggs, on the underside of the leaves, one egg per plant. However, she encounters a problem. She is unable to find any plants suitable for her progeny...

It's time for action! You can be a leader in helping save the monarchs' milkweed habitats by planting the host plant for the larvae of both monarch and queen butterflies in your garden. Due to continued habitat destruction, mowing of roadsides, and the use of herbicides throughout the United States entire fields of this magnificent native plant have been depleted to the point where the females are having difficulty finding enough host plants to deposit their hundreds of eggs.

Approximately 110 species of milkweed, in the genus *Asclepias*, grow throughout North America. Georgia has a very high concentration of milkweed species because of the variety of different habitats found throughout the state. Of the 22 species of milkweed found in Georgia, one of my favorites to grow in my garden is butterfly weed (*Asclepias tuberosa*-- as-KLEE-pea-us too-beh-ROW-suh).

Don't let the name fool you. Butterfly weed is a 2 feet tall *trouble-free* perennial plant. It has multiple stout branching stalks with mostly alternate hairy leaves. Butterfly weed is unique among milkweeds in that the sap is not milky and the leaves are not opposite. Blooms first appear in early summer and continue into late summer.

The flowers are usually a fragrant brilliant orange and occasionally found in yellow or red. The blooms are followed by attractive green seedpods that are 3 to 6 inches long and ½ to 1 inch wide that open to release silky "parachutes" to drift away on autumn winds (or be collected and shared with neighbors, friends, and other master gardeners).





Besides being found in many native plant gardens it may also be found growing in dry fields, roadsides, and margins of the woods throughout Georgia. It comes up year after year from underground tubers in the same place without crowding its neighbors. It prefers full sun, but can tolerate partial shade and can tolerate drought. It resents being transplanted, so it is best to propagate it from cuttings, taken in spring, or from seed.

For a fall planting prepare the soil in a sunny spot in your garden by turning it over with a shovel. Scatter the seeds in the newly turned part of your garden, lightly covering them with the soil. Butterfly weed is slow to emerge, so you may want to mark where you have planted it. Next spring, look for new milkweed plants, monarch eggs and caterpillars!

If you are interested in obtaining free milkweed seeds please contact Karen Garland at kgarland@gaconservancy.org

Monarch and Viceroy Facts:
Not Batesian Mimicry, but Mullerian Mimicry

Monarch (<i>Danaus plexippus</i>)	Viceroy (<i>Limenitis archippus</i>)
 <p>No black band running horizontally across the hind wings</p>	 <p>Black band running horizontally across the hind wings</p>
Usually a much bigger butterfly, flaps and then glides	Flutter as it flies
Overwinters in Mexico	Overwinters in its home environment at the first and second growth stages (instars) of the caterpillar, in a form of hibernation (diapause).
Caterpillar striped orange, yellow, and black, with tentacles on both the head and tail end	Caterpillar resembles a bird dropping



Batesian Mimicry Versus Mullerian Mimicry

In 1862, Henry Bates, an English naturalist, suggested that non-toxic species might evolve over time to look like toxic species. The non-toxic species would benefit because predators would avoid it as well as the toxic species.

During the mid-twentieth century, **Batesian mimicry** was widely accepted as an explanation for the very close resemblance between the Monarch and the Viceroy. The Monarch was assumed to be toxic, due to the fact that the caterpillars eat milkweed plants and absorbs the toxic cardiac glycosides. The Viceroy was assumed to be non-toxic, as its caterpillar feeds on willow family members. However, more recent research has cast doubt on any such simple relationship between the two butterflies. In 1991, David Ritland and Lincoln Brower fed only the abdomens of Monarchs, Viceroy, and Queens to red-winged blackbirds, a frequent butterfly predator.

Presented with abdomens only, the birds would not be able to identify butterflies by their wing patterns, and would have to rely on smell and taste alone. The birds found Monarchs and Viceroy about equally unpalatable (40% eaten), and Queens more palatable (70%). They ate 98% of the non-toxic controls.

Clearly, the Viceroy does not reduce its chance of being eaten by looking like the Monarch. Predators do not like either

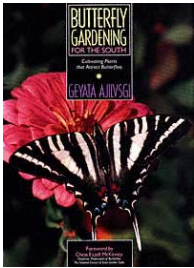
species much. Batesian mimicry was considered disestablished, although many popular sources continue to offer it as an explanation.

Researchers have proposed another explanation for the resemblance of the adult Monarch and Viceroy: **Mullerian mimicry**. In 1878, German zoologist Fritz Muller, an Amazon naturalist like Bates, suggested that a number of toxic species might adopt the same warning pattern (*an aposematic pattern*). The predators would learn faster if they had to learn only one signal to avoid, so, overall, fewer of all the prey species in the group (mimicry complex) would be eaten.



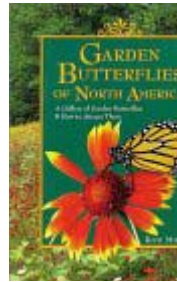
Source: www.iscid.org

Monarch and Other Butterfly Resources



Butterfly Gardening for the South ISBN: 0878337385

By Geyata Ajilvsgi, this book is a complete reference for southern gardeners who want to attract butterflies to their gardens year after year. It is more than a plant list, as it tells about their lifestyle, feeding habits, types of caterpillars, and their enemies.



Garden Butterflies of North America: A Gallery of Garden Butterflies & How to Attract Them ISBN: 1572233060

Rick Mikula offers readers a study of 40 North American butterflies. He details habitat, diet, size, color (including the color of eggs, caterpillars, and pupa), migration, flight, and mating habits.

Grants

For an extensive list of grant opportunities, for not only butterfly gardens, but also outdoor classrooms please visit the Environmental Education Alliance of Georgia web page at http://www.eealliance.org/occ%20symposium/grant_resources.htm. Also included is a link to a tutorial on how to write successful grant applications.

North American Butterfly Association

<http://www.naba.org/>

As the largest group in North America (Canada, United States, and Mexico) interested in butterflies, they are a membership-based not-for-profit organization working to increase public enjoyment and conservation of butterflies. Visit their website for gardening and photographing tips, activities, and answers to your butterfly questions.

Imitation Simulation Activity

Purpose: This activity is designed to simulate mimicry in nature. Various assorted materials can be used to represent prey. Students represent predators.

Suggested Materials: Fruit Loops/Gummy Savers (120-150 assorted colors/class of 20) Salt Water/Concentrated lemon juice/ Worcestershire sauce (Caution students to not reveal any aspect of what they experience with each other.)



Procedures:

1. Prior to the activity choose one color of the food item to prepare by placing a few drops of an unpleasant tasting food substance on around 25 – 35 of them. Allow the items to dry thoroughly.
2. On the day of the activity spread 120-150 of chosen food items on a clean tray or tabletop in a random fashion. Record number of each different colored "prey" at beginning of activity.
3. Have each student come up the table and choose one food item to snack on when they return with it to their seat.

4. After all students have returned to their seats, have them record their observations/tastes.
5. Record colors and numbers of different "prey" remaining. Repeat steps three and four for additional four or five rounds.

Follow-up Discussion

1. What colors remain and in what proportion? Explain these results.
2. How might this exercise relate to organisms in nature?
3. What method of evading predators does this activity illustrate?
4. Give actual examples from nature that this activity.



A Few Georgia Gardens that Invite Butterflies ...and Their Friends...

- **Atlanta Botanical Garden:** 1345 Piedmont Avenue Northeast, **Atlanta** (404)876-5859.
- **Atlanta History Center:** 130 West Paces Ferry Road, **Atlanta** (404)814-4000.
- **Augusta Golf & Gardens:** One Eleventh Street, **Augusta** (706)724-4443.
- **Callaway Gardens:** U.S. Hwy. 27, P.O. Box 2000, **Pine Mountain** (800)225-5292.
- **Fernbank Science Center:** 156 Heaton Park Drive, NE, **Atlanta** (404)378-4311.
- **Georgia Southern Botanical Garden:** 1505 Bland Avenue, Georgia Southern University, P.O. Box 8039, **Statesboro** (912)871-1114.
- **Lockerly Arboretum:** 1534 Irwinton Road off Highway 441 South **Milledgeville**, (912)452-2112.
- **State Botanical Garden of Georgia:** University of Georgia, 2450 S. Milledge Avenue, **Athens** (706)542-1244.
- **Vines Botanical Gardens:** 3500 Oak Grove Road, **Loganville** (770)466-7532.

Contact Us

Please feel free to forward this issue to friends and associates. Anyone can subscribe to this free quarterly newsletter by emailing:

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To unsubscribe type "Unsubscribe MAG Newsletter" in the subject line.

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We're on the Web!
www.monarchsacrossga.org

✂ Each issue we will spotlight a butterfly found in Georgia. Cut along this line to create your own Georgia butterfly field guide.

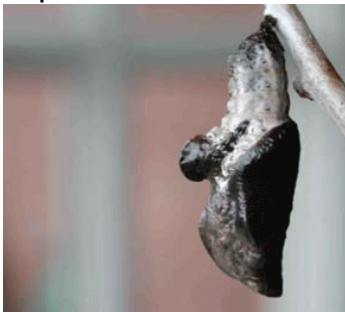
Egg



Caterpillar



Pupa



VICEROY (*LIMENTIS ARCHIPPUS*)

Fast Facts

- Adult wingspan is 2.5 to 4.0 inches (6.0 to 8.5 cm)
- Host plants: Willow and poplar trees
- Preferred habitat includes meadows, marshes and swamps and other wet areas with willow, aspen and poplar trees.
- Young caterpillars make a ball of leaf bits, dung, and silk, which hangs off the leaf on which they are feeding. The dangling mass of caterpillar "debris" may distract predators.
- Third-stage caterpillars make a shelter from a rolled leaf tip in which to spend the winter.
- There are usually two or three generations of viceroys born each breeding season.

Adult



Notes: