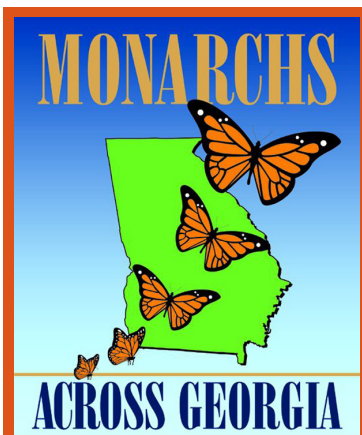


The Chrysalis

Emerging News from Monarchs Across Georgia

A Committee of the Environmental Education Alliance of Georgia



Upcoming Events

Naturalist Rally

September 24 • 9:00am - 5:00pm
Stone Mountain Park

Monarchs Across Georgia Teacher Workshop

October 7 • 5:30pm - 8:30pm
AND October 8 • 9:00am - 4:00pm
Confederate Hall,
Stone Mountain Park

Outdoor Learning Symposium

October 21 • 9:00am - 5:00pm
Georgia Perimeter College,
Decatur

Environmental Education Alliance of Georgia Annual Conference

March 30 - 31
Southwest Arts Center, Atlanta

For more information about these events or to register, please visit www.monarchsacrossga.org

The Fall Migration is Near!

As summer draws to a close, we will soon see millions of Monarch butterflies on their way to their overwintering habitat in central Mexico. MonarchWatch.org gives a helpful overview for when to start looking for migrating Monarchs in your area.



The following is a general, not a specific, guideline for when you are most likely to encounter good numbers of monarchs at each latitude. The table below gives the latitude, the midpoint of the migration and the period of peak abundance. Each recovered butterfly is associated with a date and the dates of these recoveries show the migration to be relatively predictable over the continent. The record at specific locations for a given year may differ from this overall pattern but it has proven to be remarkably consistent when viewed as a large-scale phenomenon. As such, it has a phenology and it's predictable. Notice that I have used midpoint as a predicted date rather than a mean. The distribution of the migrants appears not to be a normal bell-shaped curve but a curve that is shifted strongly to the left. Hence, when estimating the time of peak abundance below I have used a 12-day interval with 7 days before the midpoint and 4 days after the midpoint.

As mentioned above, this is a general pattern. It is likely to be modified by weather patterns that retard, such as strong southwesterly winds, or advance the migration, such as a series of rapidly moving cold fronts arriving from the northwest. Similarly, the pattern of the migration is likely to be modified along the coasts due to strong head winds or storms that have the effect of sweeping monarchs toward the coast on the backside of fronts.

Latitude	Midpoint	Peak in monarch abundance
49	26 August	18-30 August
47	1 September	24 August - 5 September
45	6 September	29 August - 10 September
43	11 September	3 - 15 September
41	16 September	8 - 20 September
39	22 September	14-26 September
37	27 September	19 September - 1 October
35	2 October	24 September - 6 October
33	7 October	29 September - 11 October
31	12 October	4-16 October
29	18 October	10-22 October
27	23 October	15-27 October
25	28 October	20 October - 1 November
23	4 November	27 October - 8 November
21	11 November	3-15 November
19.4*	18 November	10-22 November

*This latitude represents the general vicinity of the overwintering colonies.

You can use Google to find your latitude by entering "City, State latitude". For reference, Atlanta, Georgia is at latitude 33.

Milkweeds

Not just for Monarchs

by Brianna Borders and Matthew Shepard

Standing in a field of milkweed plants, John Anderson watches a monarch butterfly search for a place to lay her eggs. This sight epitomizes most people's image of milkweed: food for monarch caterpillars. This, however, is no ordinary field of milkweed, and John is not most people. The co-owner of Hedgerow Farms near Winters, California, John is at the forefront of a movement to encourage the use of locally native milkweed in restoration projects. As the obligate host plants for monarch caterpillars, milkweeds play a vital role in the life cycle of the monarch butterfly (*Danaus plexippus*). They also provide food or shelter for a diverse array of other insects, including nectar-seeking bees, flies, and butterflies, and such specialist herbivores as seed bugs, longhorn beetles, and leaf beetles. Native milkweeds are clearly worthy of wider adoption.

More than a hundred species of milkweeds (*Asclepias*) are native to North America and they can be found in deserts, plains, valleys, foothills, open woods, and wetlands. Milkweeds also grow in disturbed environments including agricultural areas, livestock pastures, ditches, and road sides; indeed, in some areas, these marginal habitats are the only places where milkweed is regularly seen.

Milkweed is named for its milky latex sap, which oozes from damaged leaves and stems. This sap contains alkaloids and cardenolides, complex chemicals that make the plants toxic to animals. If eaten by livestock, milkweed typically causes depression or diarrhea, although it may be fatal. Fortunately, milkweed is bitter in flavor and unpalatable, and range animals will generally avoid eating it if sufficient forage is available; most milkweed poisoning results from hungry animals being concentrated in areas where milkweed is abundant.

The toxin-laden sap deters mammals, but insects have an amazing capacity to overcome the chemical defenses of plants, particularly those with which they have a shared evolution. In fact, a large number of insects eat milkweeds, often harvesting the toxins for use in their own defense; of the insects that do this, monarchs are the best known. Their caterpillars sequester the toxins and store them in their tissues, giving them a bitter taste. They have boldly colorful - aposematic - markings, which serve as a reminder to

birds and other predators. Other milkweed feeding insects, including milkweed bugs, milkweed longhorn beetles, and milkweed leaf beetles, sequester and store the milkweeds' toxic chemicals to aid their own defense, and like monarch caterpillars, generally have aposematic markings.

Large milkweed bugs (*Oncopeltus spp.*) feed only on milkweeds and closely related plants. Although these bugs will feed on young leaves, flowers, and developing pods, a seed diet provides for optimal growth and reproduction, and for this reason adults lay their eggs close to developing pods. Small milkweed bugs (*Lygaeus spp.*) feed on seeds as nymphs but they can develop on plants other than milkweeds. As adults, they are not strictly herbivorous, and will scavenge insects trapped in milkweed flowers, feed on monarch butterfly pupae, and even engage in cannibalism.

Milkweed longhorn beetles (*Tetraopes spp.*), so-named for their prominent antennae, feed exclusively on milkweeds and close relatives. They are generally host specific - there are thirteen species of milkweed longhorn beetles in the United States and each prefers a different species of milkweed. The milkweed leaf beetle (*Labidomera clivicollis*) overcomes milkweed's defenses by biting through veins of the leaf. The sap drains from the outer part, and the beetle can feed in relative safety on the drained area beyond the cuts.

The relationship between milkweeds and insects is not one-sided. Milkweeds are entomophilous, meaning that they depend on insects for their pollination. Milkweed pollen does not occur as free grains, but instead is contained in pairs of waxy sacs - pollinia - that are located within vertical grooves on the flowers, called stigmatic slits. Each pollinium contains several hundred grains of pollen. An insect that visits a flower to obtain nectar may leave with a pair of pollinia affixed, the result of coming into contact with a corpusculum, a pollinia-bearing gland located at the top of a stigmatic slit. (Insects may accumulate strings of corpuscula and pollinia from repeated flower visits. In Robert Woodson's extensive monograph on the *Asclepias* species of North America, he reported an instance of a single honeybee carrying forty-five corpuscula!) Pollinia most commonly become attached to an insect's legs but they can also be borne on the mouthparts or on any barbed or hairy surface of an insect's body. Fertilization occurs when pollinia are transferred by the insect into the stigmatic slits of another milkweed flower.

Although milkweeds have a very specialized pollination mechanism, they do not require specialist insects to activate it. Any insect that is large enough to remove and transport pollinia can be an effective pollinator, and milkweeds are pollinated by a broad range of bees, wasps, butterflies, flies,

and beetles, even true bugs. A review of milkweed pollination studies completed by Jeff Ollerton and Sigrid Leide revealed that whorled milkweed (*A. verticillata*) has 126 documented pollinators.

With their pollen enclosed within pollinia and inaccessible, milkweeds have only nectar with which to reward visitors. Even so, they attract a tremendous variety of insects with the abundant, high-quality nectar that is readily accessible in the hoods of their flowers. Many of the nectar-seeking insects inadvertently end up as pollinators, while others bring benefits in other ways. In a recent study by David James of Washington State University, milkweed - in this case, showy milkweed (*Asclepias speciosa*) - attracted the highest number of beneficial insects of any of the forty-three species of native flowers being studied.

Insects whose adults visit milkweeds for nectar include ichneumon, braconid, and mymarid wasps, all of which are parasitoids (meaning that they lay eggs on or in a host insect; once hatched, their offspring then consume the host), and thus natural predators of crop or garden pests. The closely related ichneumon and braconid wasps typically parasitize aphids or the soft-bodied larvae of such insects as butterflies, flies, and beetles, while mymarid wasps parasitize insect eggs. Syrphid flies are also attracted to milkweeds: the adults drink the nectar and their highly mobile larvae prey directly on aphids.

One conspicuous insect that can frequently be seen nectaring on milkweed in California and the desert Southwest is the tarantula hawk wasp (*Pepsis spp.*). As their name suggests, these wasps hunt tarantulas, not for themselves – as adults they eat only nectar - but to supply the nests of their offspring.

Like many native plant species, milkweed populations are being lost at a rapid rate due to urban and suburban development and agricultural intensification. Despite their native status, unique beauty, and value to the monarch butterfly as well as to a tremendous range of pollinators and other beneficial insects, milkweeds are often perceived as crop weeds or a threat to livestock and eradicated from agricultural areas, rangelands, and roadsides.

Loss of milkweeds is believed to be one of the factors (along with disturbance to and destruction of overwintering sites)

that have led to the steep decline of the western population of monarchs. The butterflies spend the winter months in tree groves along the coast of California, the only U. S. state with large numbers of overwintering monarchs. Each spring, the butterflies leave the groves in search of milkweed on which to lay their eggs. Over the summer, successive generations spread out across North America west and south of the Rocky Mountains and as far north as British Columbia, with the last generation making the journey back to the California coast. Unfortunately, western monarchs are in trouble. Data collected by volunteers show that the number of overwintering monarchs has dropped by more than 90 percent since 1997.

In 2008 the Commission for Environmental Cooperation (a treaty organization of the United States, Canada, and Mexico) published the North American Monarch Conservation Plan, addressing the steady decline of the butterflies across their native range since population monitoring first began in 1976. Because of their migratory lifecycle (breeding in the United States and Canada, overwintering in Mexico and California), the most effective conservation strategies for monarchs are those that protect and restore habitat across their entire range. The plan cites broad national declines in milkweeds and recommends the planting of regionally appropriate native milkweed species to offset the loss and degradation of monarch breeding habitat.

Unfortunately, few commercial sources of native milkweed seed currently exist across the monarch's spring breeding range in the United States - California, the Southwest, Texas, and Florida - and, in these places, either no milkweeds are planted or those that are planted are species from outside of the region. Clearly, there is a need for sources of locally native milkweed seed. In 2010, with support from the Monarch Joint Venture and a Conservation Innovation Grant from the USDA Natural Resources Conservation Service (NRCS), the Xerces Society launched a multistate initiative to increase the availability of native milkweed seed for monarch habitat conservation efforts. Xerces is working with the native seed industry to develop new sources of regionally appropriate native milkweed seed, and working with the Niles to incorporate milkweeds into the agency's pollinator habitat restoration projects.



This article was originally published in the Spring 2011 issue of Wings Magazine, a publication of the Xerces Society.

\$1,000 Scholarships for 2012 Monarchs in Mexico Trips

Monarchs Across Georgia, a committee of the Environmental Education Alliance of Georgia, is pleased to offer \$1,000 scholarships to educators (normal or informal) to travel to the monarch butterfly overwintering sites in Mexico February 7-11 or February 11-18, 2012. Three scholarships, funded by Monarchs Across Georgia plant sale profits, are available this year.

Participants will learn about local efforts to promote sustainable and environmental sound economic activities and visit at least one school near the monarch preserves to donate books purchased through the Mexico Book Project.

Scholarship applicants must be currently employed in Georgia as a classroom teacher or informal educator and education must be more than 15% of their job responsibilities. Written approval from the applicant's school administrator or employer is also required. **Applications are due October 15, 2011.**

Details and application can be found at
www.MonarchsAcrossGA.org.

**Congratulations to
our newly certified
Pollinator Habitats!**

**Diane Korzenrewski, Gainesville
Gardens on the Green, Gainesville**

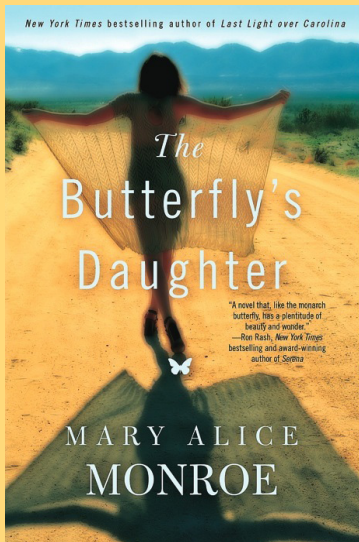
Athena Rayne Anderson, Athens

Cindy Wolfe, Atlanta

Chrissy O'Donnell, Ellijay

Carol Toriani, Doraville

Katie Sanstead, Marietta



Recommended Reading

The Butterfly's Daughter

by Mary Alice Monroe

When Luz Avila's grandmother, the local butterfly lady, unexpectedly dies, Luz is compelled to carry her ashes home to her mountain village in Mexico. Inspired by the Aztec myth of the goddess who brings light to the world, Luz attracts a collection of women, each seeking change in her life. Yet no one's life changes more than Luz's when she meets her long-lost mother, a woman she had believed dead.

Their mishaps, trials, and joys are met with humor and compassion, culminating in their triumphant arrival in Mexico on the Day of the Dead celebration. The Mexican people believe the monarchs are the spirits of the recently departed, and a resplendent Luz feels the magic as she brings her grandmother's ashes home—just as millions of monarchs flutter through the village on their way to the sanctuary.

Rich with keen insight and filled with lush imagery, *The Butterfly's Daughter* is a heartwarming and unforgettable tale of mothers, daughters, and friends.

~ From Amazon.com

Fall Gardening Myth: Goldenrod Versus Ragweed

By Karen Garland

Eye-catching golden plumes swaying in the breeze along roadside ditches, old fields, and meadows are a sure sign that fall is approaching. Considered a noxious weed by many, goldenrod (*Solidago spp.*) is a largely unappreciated Georgia native perennial that is often unfairly blamed for stuffy noses, sneezing, and watery eyes from allergy sufferers. However, the true villain is usually ragweed (*Ambrosia spp.*), which blooms at the same time of year and in similar environments.



Ragweed (*Ambrosia spp.*) is an inconspicuous plant with small green flowers and deeply pinnatifid leaves.

Goldenrod produces masses of bright yellow flowers on single-stemmed plants with smooth, unlobed leaves and has relatively large, heavy pollen grains that are intended to be carried off by bees, butterflies, and other pollinators. Ragweed, which is also a Georgia native, bears small greenish-yellow flowers that do not contain nectar, but produce copious amounts of pollen that depend primarily on the wind for pollination. Because goldenrod's showy flowers stand out against ragweed's pale blooms, the myth that it is responsible for allergies has been perpetuated and believed by so many.

Growing one to four feet tall, there are approximately 125 species of goldenrod in the United States. The Southeast is home to at least 50 species. However, botanists cannot agree on how many goldenrod species exist, as the plants will often hybridize, making identification difficult. Bees, wasps, butterflies, moths, flies, and others visit for nectar and pollen. Caterpillars, aphids, and other small insects eat the leaves and stems. Wasps, spiders, praying mantids, lacewings, ambush bugs, assassin bugs, beetles, and birds prey on the insects goldenrod attracts. There is even a goldenrod spider, which specializes in hiding on these plants. Both the goldenrod gall moth and the gall fly lay eggs in the stems and leaves of goldenrod; their larvae hatch and begin eating the plant.

Growing one to five feet tall, there are approximately 17 species of ragweed, also called bitterweed or bloodweed, in the United States. Not only is ragweed the source of much human misery, but it is highly invasive, crowding out its plant neighbors. However, we have only ourselves to blame, as it merely takes freshly turned soil and sun for this plant to get established. Ragweed also has a deep taproot so it is able to survive drought and its seeds have been known to survive 40 years in the soil as they wait for the right conditions to germinate. Despite its aggravating role as an allergen, ragweed has merit, too. The seeds are an important winter food for many bird species. The leaves are also used as food by the larvae of a number of insects, including butterflies and moths.

Fortunately, many people are now aware of goldenrod's innocence and recognize its beauty and value, thus encouraging plant breeders to develop many varieties that are perfect for perennial and pollinator gardens. If it does not already grace your yard, establish some plants out in a flowerbed, in a natural border, or in an overlooked corner of your yard. When you do, you will be adding a beautiful late season bloomer to your garden that is a great nectar source for bees and butterflies.

Goldenrod (*Solidago spp.*) has showy yellow flowers and lanceolate, finely serrated leaves.



2 0 1 1

Mexico Book Project

Over the past eight years MAG has developed a special relationship with local Mexico schools to bring elementary-level books written in Spanish to students. We need your help to reach our goal of \$2,500 this year. Please consider making a tax-deductible donation to EEA designating it to the "Mexico Book Project." Your generous contribution will make it possible for MAG, a committee of the Environmental Education Alliance of Georgia (EEA), to bring much-needed educational materials to these deserving children.

As a reference, books generally cost about \$5.00 in American currency. In appreciation for your donation, a bookplate with your name (or one designated by you) will be attached to the inside cover. We will also recognize donors by publishing their names (if requested) on our website at www.monarchsacrossga.org. The deadline for these tax-deductible donations is December 31, 2011. Certificates and a letter denoting your tax-deductible donation will be provided. It's a great gift idea for any occasion!

For more information about this project and a donation form, go to www.monarchsacrossga.org and click on **Mexico Book Project** under **Trips**.



Butterfly

Where does its fire go
when a monarch dies?
Does it vanish
in smoke or turn
suddenly to rain?
Does it lie dead
against a mountainside
transforming placidly
to dirt, which
will harbor in its richness
millions of small burning ships
sailing a deep-green forest,
never to be seen? Or
Does the fire seep into the ground,
running in rivulets
toward the blazing core
of the earth
one day to return,
a volcano
spewing wings?

This poem was written after Ray visited the overwintering site of the monarchs in the Sierra Madres of Mexico. That was the year an unexpected storm decimated the monarchs, which have since rebounded. Ray found dead monarchs a foot thick on the ground, under the fir trees.

Poem by Janisse Ray. Excerpted from her collection, *A House of Branches*, published in 2010 by Wind Publications and winner of the Southern Independent Booksellers Award for poetry. Available from Wind Publications or your favorite independent bookseller.

Don't Forget!

The deadline for Symbolic Migration is October 11, 2011.
Teach lessons of conservation and ambassadorship by having your students send paper monarchs to Mexico. For more information, go to www.learner.org/jnorth

SPOTLIGHT... Plants For Your Pollinator Garden

Butterfly Weed (*Asclepias tuberosa*)

USDA Native Status: Native to the lower 48 states and eastern Canada • USDA Plant Hardiness Zones 3 to 9

This butterfly magnet was picked as a Georgia Gold Medal Perennial winner in 2010. It is the preferred food source for the larvae of several species of butterflies, including Monarchs, and the flowers provide nectar for both butterflies and hummingbirds.

About 200 species of *Asclepias* grow in the United States alone, with over 100 of these being native. The American natives are mostly erect, coarse growing perennials which flower in summer and then develop distinctive seed pods. Although *Asclepias tuberosa* is called a weed, it is not aggressive, invasive or weedy, and it will not take over the landscape.



Butterfly Weed grows 1 to 3 feet tall and has narrow, lance-shaped leaves on stout, hairy stems that do not require staking. From June to September, flat-top clusters of bright orange to yellow-orange flowers are borne on terminal stems. They hold up well in cut flower arrangements. Used in a perennial border they provide a striking contrast to purple coneflower and salvia. Caterpillars can completely defoliate this plant while feeding, but this will not kill it. Butterfly weed is also deer resistant.

Asclepias tuberosa can be propagated from seed or root cuttings but it may take 2 to 3 years to produce a flowering plant. Many local garden centers have added this plant to their perennial stock.

Lavender Mountain
HARDWARE
and garden

Species Profile: Milkweed Tussock Moth, Milkweed Tiger Moth (*Euchaetes egle*)

A member of the family Arctiidae, milkweed tussock moths are inconspicuous with unmarked gray wings and a yellow abdomen with black spots. Both milkweed and dogbane (*Apocynum spp.*) serve as host plants, and the larva are well equipped with chemical defenses from their toxic leaves.

Females lay masses, or rafts, of eggs on the underside of leaves in mid to late summer. Early instars appear gray and slightly hairy, and usually feed in groups, stripping plants completely, leaving only a lacy skeleton. Solitary older caterpillars sport tufts of black, white, and orange setae with a black head capsule. They overwinter as a gray cocoon that appears "felted" from the larval hairs.

Adults are equipped with tymbal organs, which males use to call to females during courtship. The tymbal organ is also effective at deterring red bats and big brown bats, their most common predators. The high pitched clicks imitate the sounds of other moth species that are so unpalatable that bats steer clear.

