

Pulaski County Master Gardeners Butterfly Seminar



February 20, 2018

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Botanical Garden of the Ozarks

Butterfly Gardening

Life Cycles of Native Butterflies

The Butterfly House at the BGO

Raising Butterflies at Home

Butterfly Gardening



Why garden for butterflies?

- Joy!
- Attract beneficial organisms to your garden
- Increase pollinator habitat
- Support diversity

Besides the obvious
beauty of what you'll
get to enjoy...





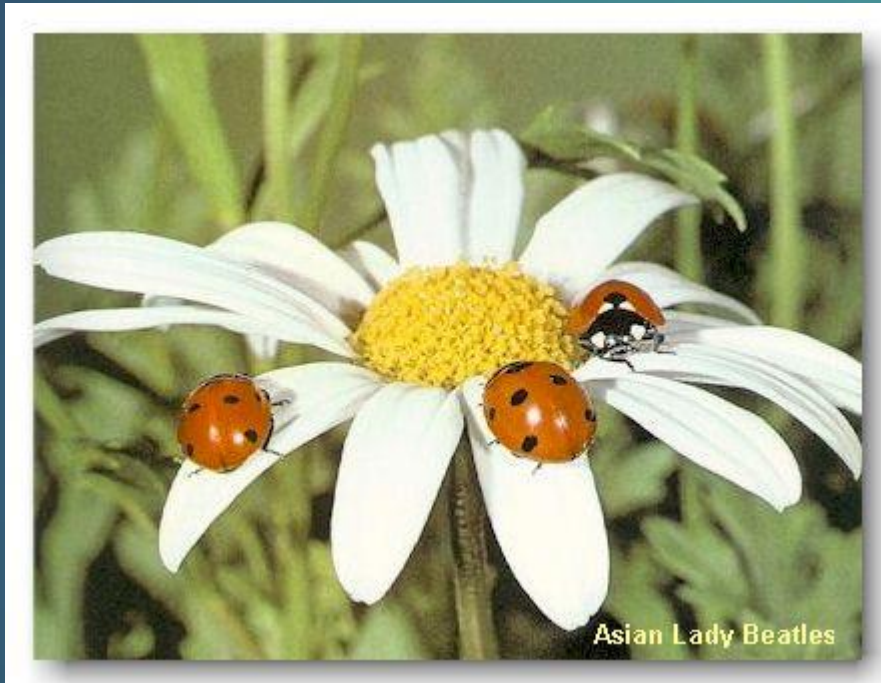






there are other
benefits to
creating a
butterfly
garden...

To attract other beneficial insects



To provide food and shelter for other organisms

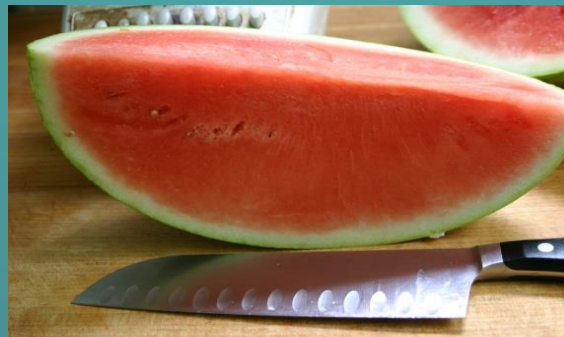
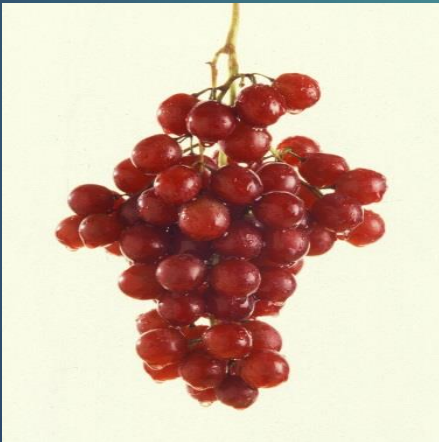
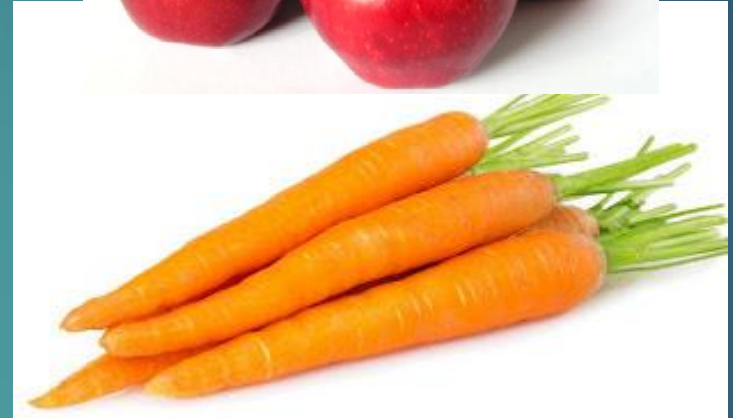


To increase habitat for pollinators

- Alarming news about the decline of pollinators
- So much more than honey bees
 - Half of native bee populations declining and nearly 1 in 4 native bee species is imperiled
 - Native bees more efficient pollinators
 - Beetles, flies, wasps, ants

Pollinators

Without pollinators, we would lose 33% of what we eat



Pollinators

- 1000 of 1200 common crops are pollinator dependent
- Foraging crops are pollinator-dependent, so even some of the meat we eat is reliant on pollinators
- Fruits and seeds do not develop without pollination, so much of wildlife is also dependent on pollinators
- Pollinators are also important in the production of certain medicines



BEEES ARE VITAL FOR THE ALFALFA AND CLOVER
THAT FEED CATTLE. **WITHOUT THEM,** THERE
WOULD BE LESS BEEF, MILK AND **CHEESE** 🧀



Butterflies are Pollinators



Butterfly Plant Materials – Two Categories

Nectar plants - for adults

Host plants - on which butterflies lay
eggs

- Caterpillars only eat certain plants
- Biologically adapted to be able to digest only those plants

How does a butterfly know on which plant to lay her eggs?



Butterfly Garden Plant Material Considerations

- Use of natives is best
- Plant in color groups
- Vary the height
- Flower shape matters
- Plant for blooming in different seasons

Why Native Plants?

Native plants are those which evolved in a region naturally

- Animals lived side by side with these plants in a cooperative relationship
- There is some evidence that native plants provide better nectar
- Ecosystem as a whole benefits; biodiversity promoted
- Once established, natives are often easier to maintain



Purple Prairie Clover



Joe Pye Weed



Black-eyed Susan

People worry
about natives
growing out of
control



Plant in Color Groups

Butterfly vision

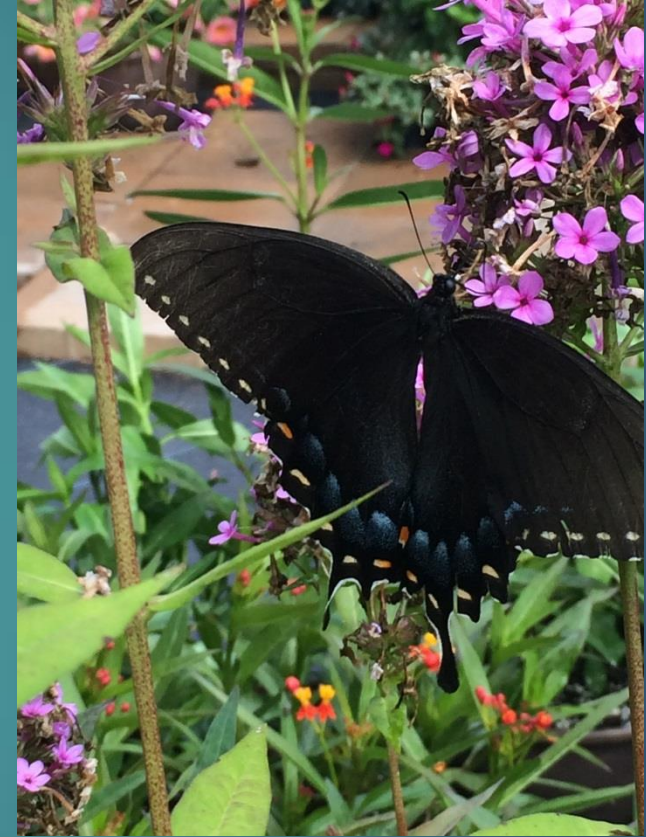
- Can't see single flowers from distance
- Thus, best to plant in clusters of color



- For butterflies, most attractive colors are:
red, yellow, orange, pink
and purple

Vary the Height of Nectar Plants

Butterflies nectar at different heights



Spicebush is almost always
down low

Flower Shape Matters

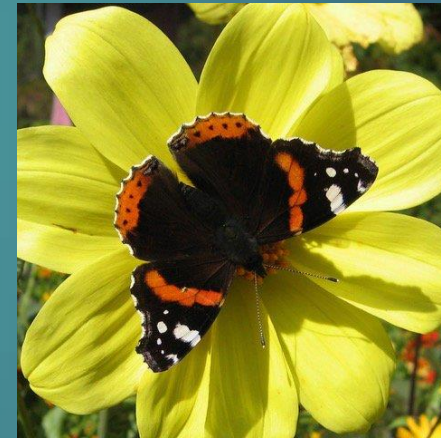
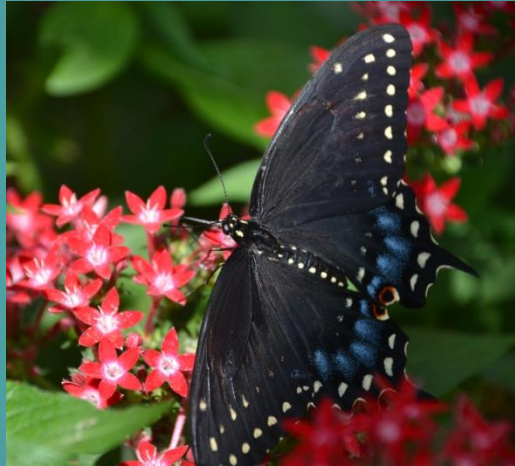


Pollinator syndrome

- Certain shapes of flowers are matched to certain types of pollinators

For butterflies

- Flowers in small clusters
- Flowers with a landing pad
- Flowers with spikes



Plant for bloom spring through fall

- Native butterflies arrive at different times
- Butterflies have differing numbers of broods
- Some butterflies are migratory
 - We might see them in spring and then again in fall
 - Monarch – important to have spring and fall since migrate so far



Include Shrubs and Spring-blooming Trees



Dogwoods provide nectar and are the host for the spring azure



New Jersey Tea



Leadplant



Laying Out the Garden

Spread out host plants

- But do plant near the nectar plants
- Just put some in hidden and less obvious areas
- Or put one where easily found, others in less conspicuous places

Provide for a windbreak

Make a puddling area

Provide places for basking

Provide other shelter

Locate Next to Windbreak



Improvise!



Or Use Shrubs



Button bush

Clethra



to provide nectar
and shelter

Puddling



Some butterflies, especially males, sip nutrients from soil, sand, or dung

Puddling Areas

- Sink a plastic plant tray into the ground at soil level
 - Fill with sand and rocks
- Can lay container on top of soil
- Other things to add
 - Manure
 - Compost
 - Fruit
 - Water to dampen, but not full of water like a bird bath

Puddling Areas



Why do butterflies find large flat rocks?



Other Considerations

- Fall cleanup may disturb overwintering eggs, caterpillars, or chrysalids
- Wood piles or piles of clippings are good overwintering sites
- Have a wild area of your garden that you don't clean up – leave stalks of perennials



Would lose this guy in fall cleanup



Other considerations

Mulch at base of plants



Most importantly....

Pesticides and herbicides

- Most are indiscriminate
- Be careful with plant purchases and systemics (neo-nics)



Favorite Nectar Plants

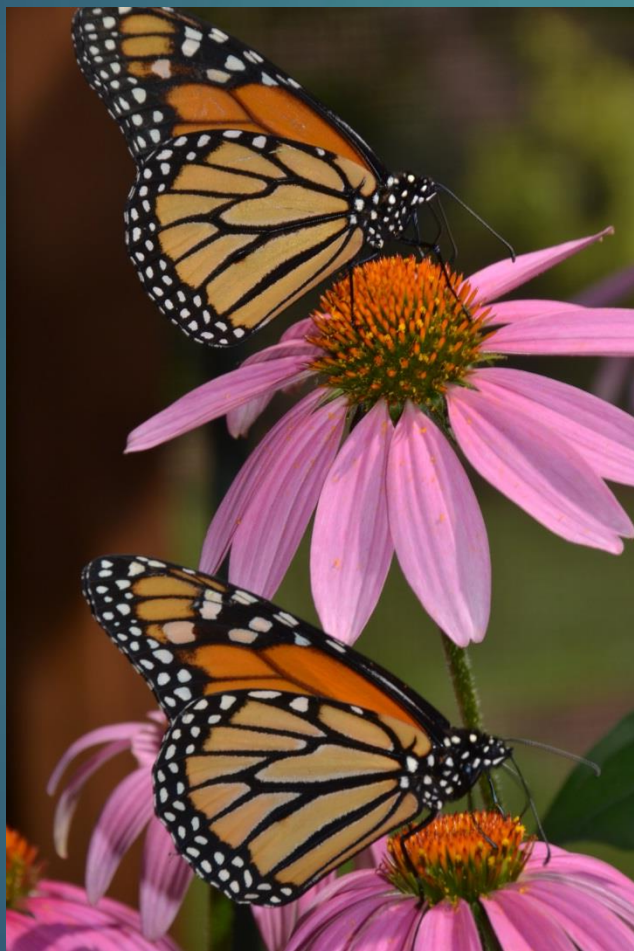
Joe-Pye Weed



Butterfly Weed
Asclepias tuberosa



Purple Coneflower

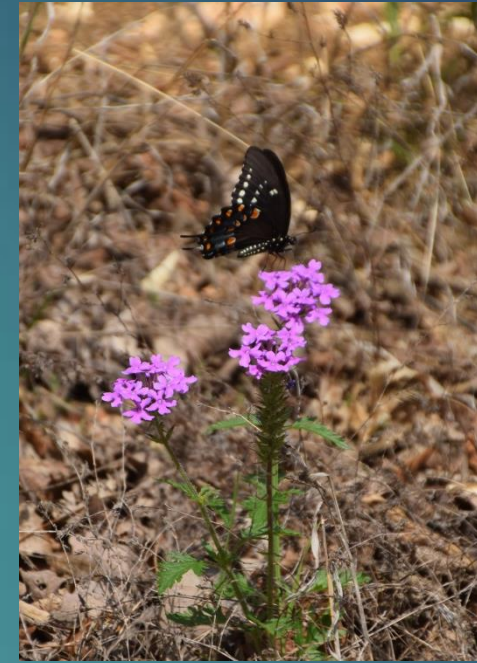


Tall Garden Phlox





New England Aster



Rose Verbena



Ironweed



Texas Greeneyes



Solidago – Goldenrod



Liatris



Echinacea

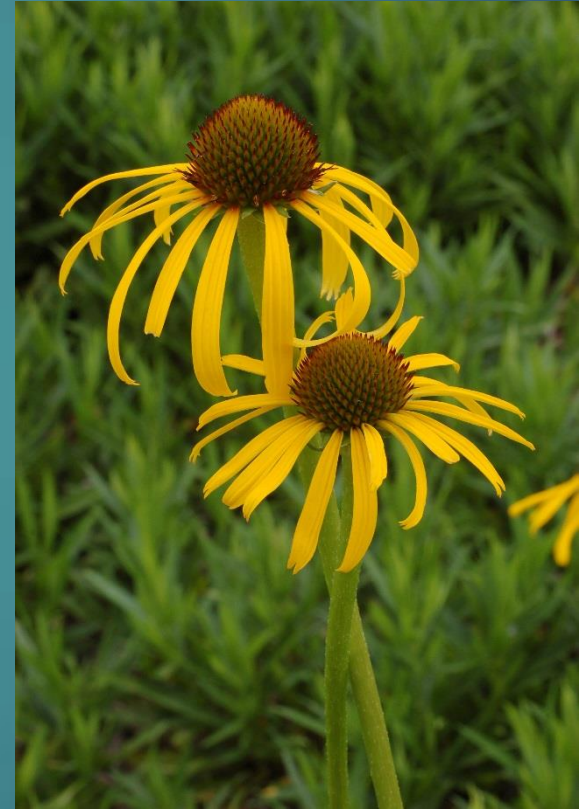
Purpurea



Pallida



Paradoxa



Agastache 'Black Adder'



Asclepias

Tuberosa



Syriaca



Asclepias

Purpurascens



Incarnata



Asclepias

Viridis



Sullivanti

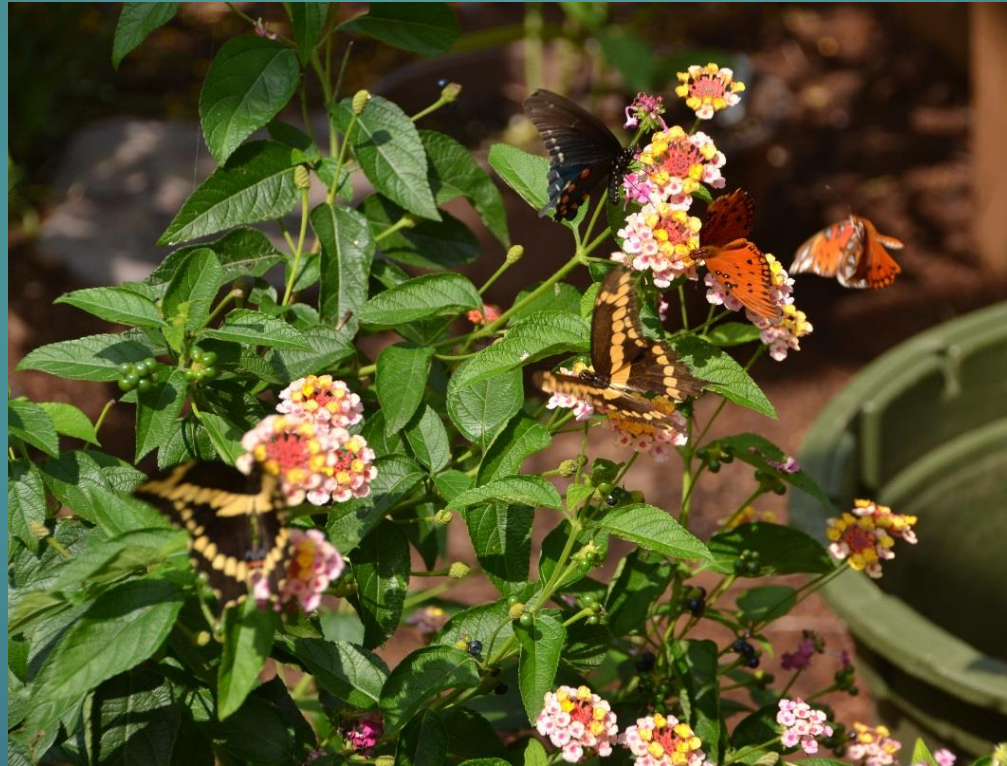


However, at the BGO some annuals are favorites...



Small butterfly on zinnia

At least three species on lantana



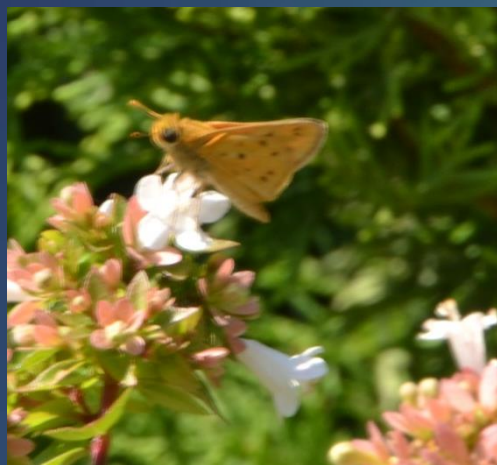
Gulf fritillary on penta

Dianthus

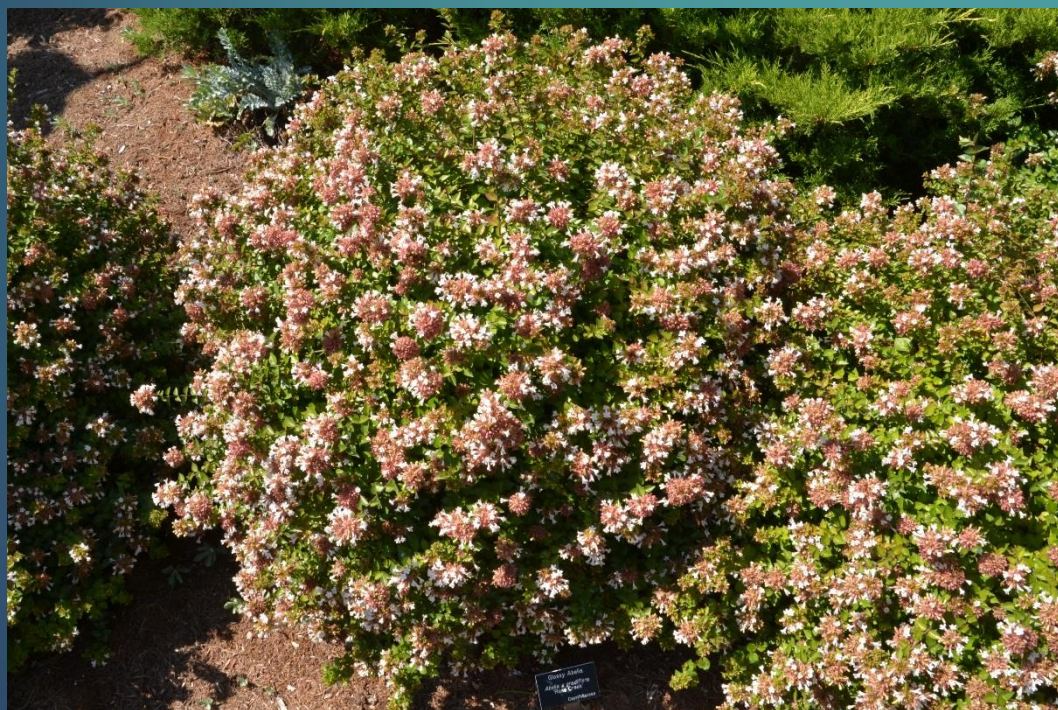


Petchoa
(Supercal)



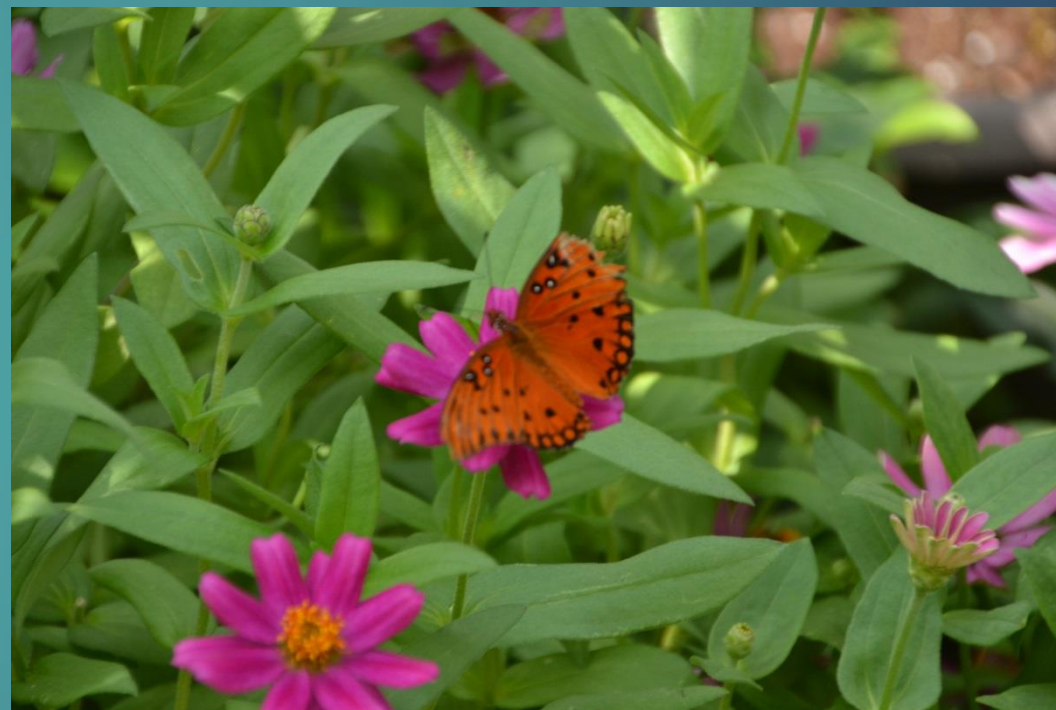


Abelia



Zinnias

Especially 'Profusion', 'Lilliput'
and 'Cut and Come Again'



Butterfly Bush



Tall Verbena



Not All Butterflies Nectar Alike



Some prefer rotting fruit



Ways to provide fruit



Beyond Second Grade Butterflies

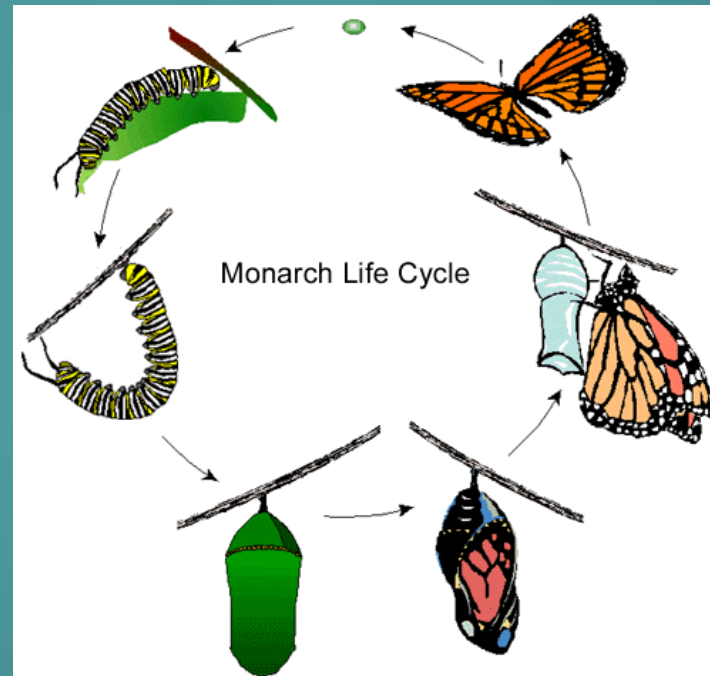
Life Cycles

The Wonderful World of Caterpillars

Butterfly Defenses

Life Cycles

More than egg, caterpillar, chrysalis, butterfly



Giant Swallowtail



Eggs on rue



Early instar



Later instar



Chrysalis



Preparing to pupate

Newly eclosed giant

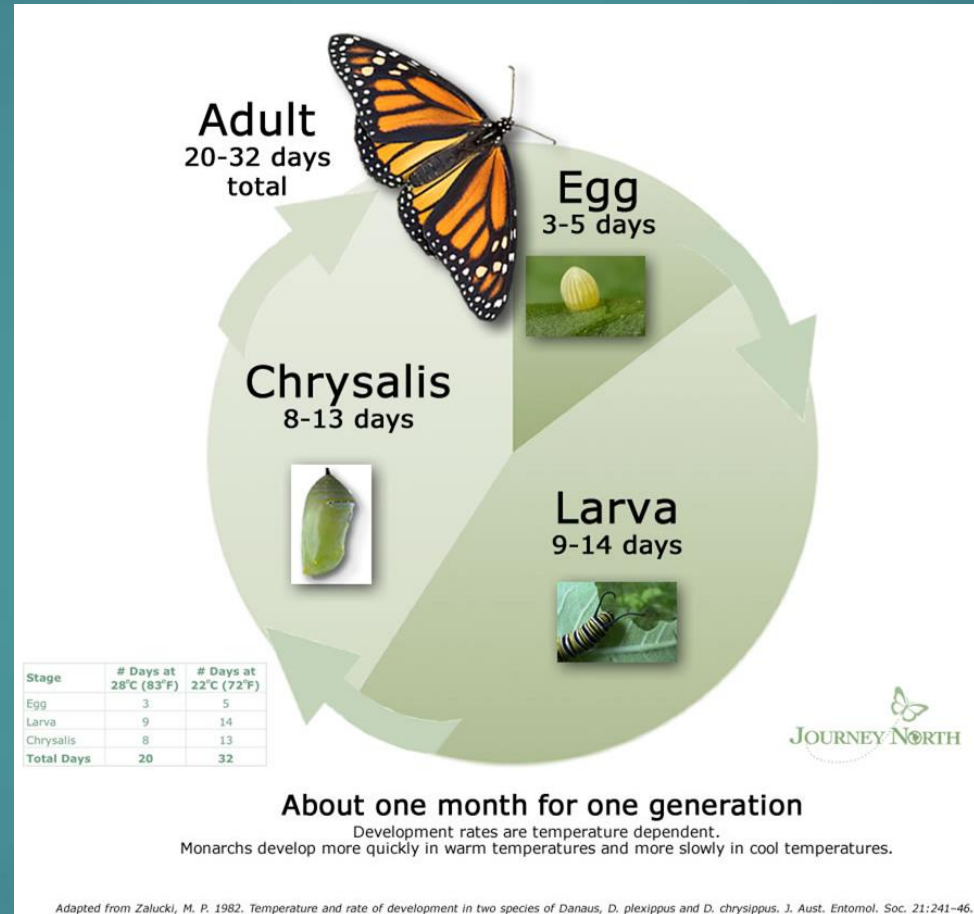


What's this about instars?



- Various stages of pipevine swallowtail caterpillars
- Each stage is called an instar
- Notice the changing appearance

How long is the butterfly life cycle?



Spicebush Swallowtail



Eggs on spicebush



Early instars



Chrysalis



Later instar



Preparing to pupate

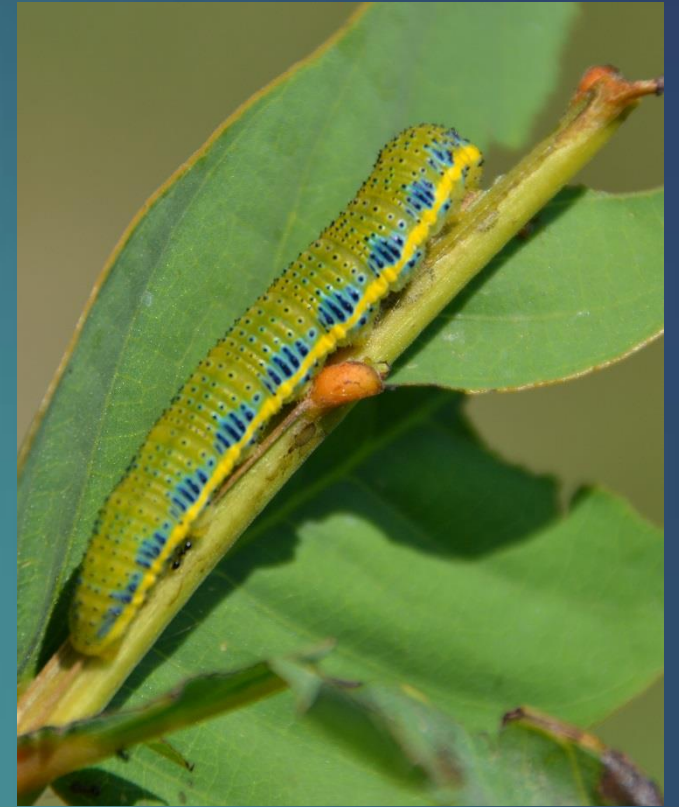
Cloudless Sulphur



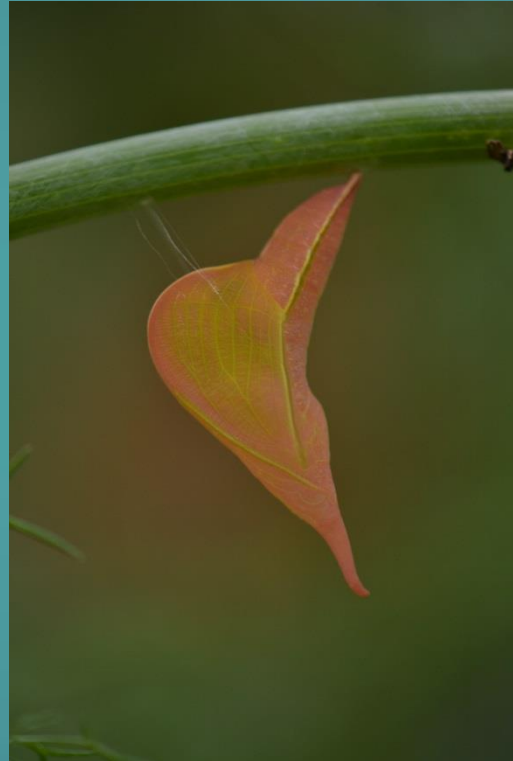
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Egg



Caterpillar

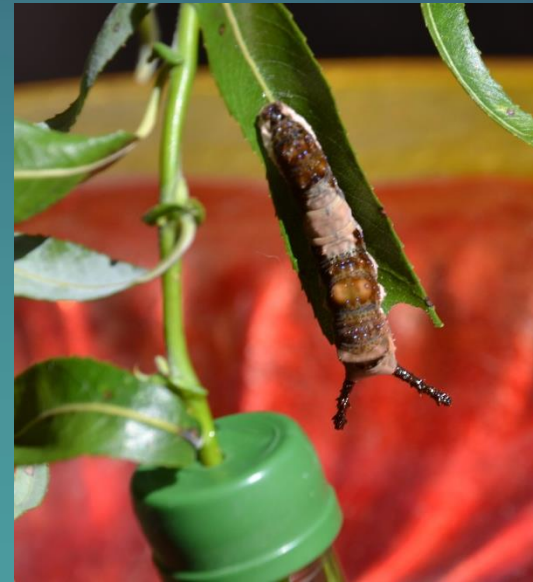


Chrysalis



Preparing to pupate

Red-spotted Purple



Caterpillar



Chrysalis



Hibernaculum



Emerging
from
hibernaculum
in March



Pipevine Swallowtail



Eastern Black Swallowtail



Early Instar

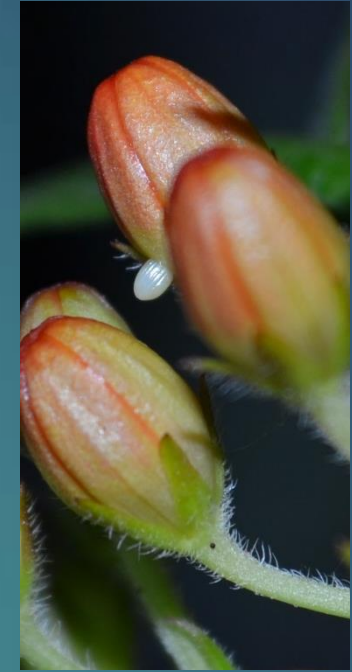
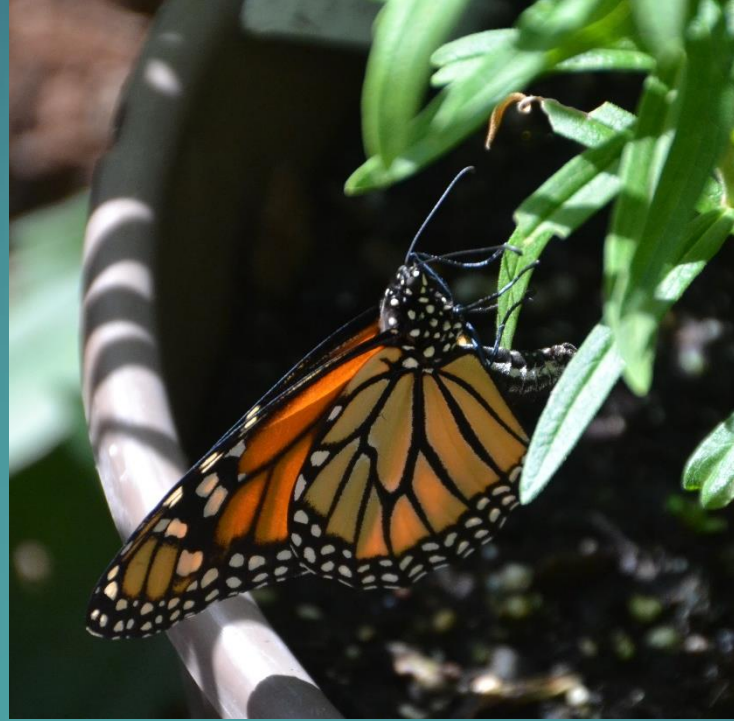
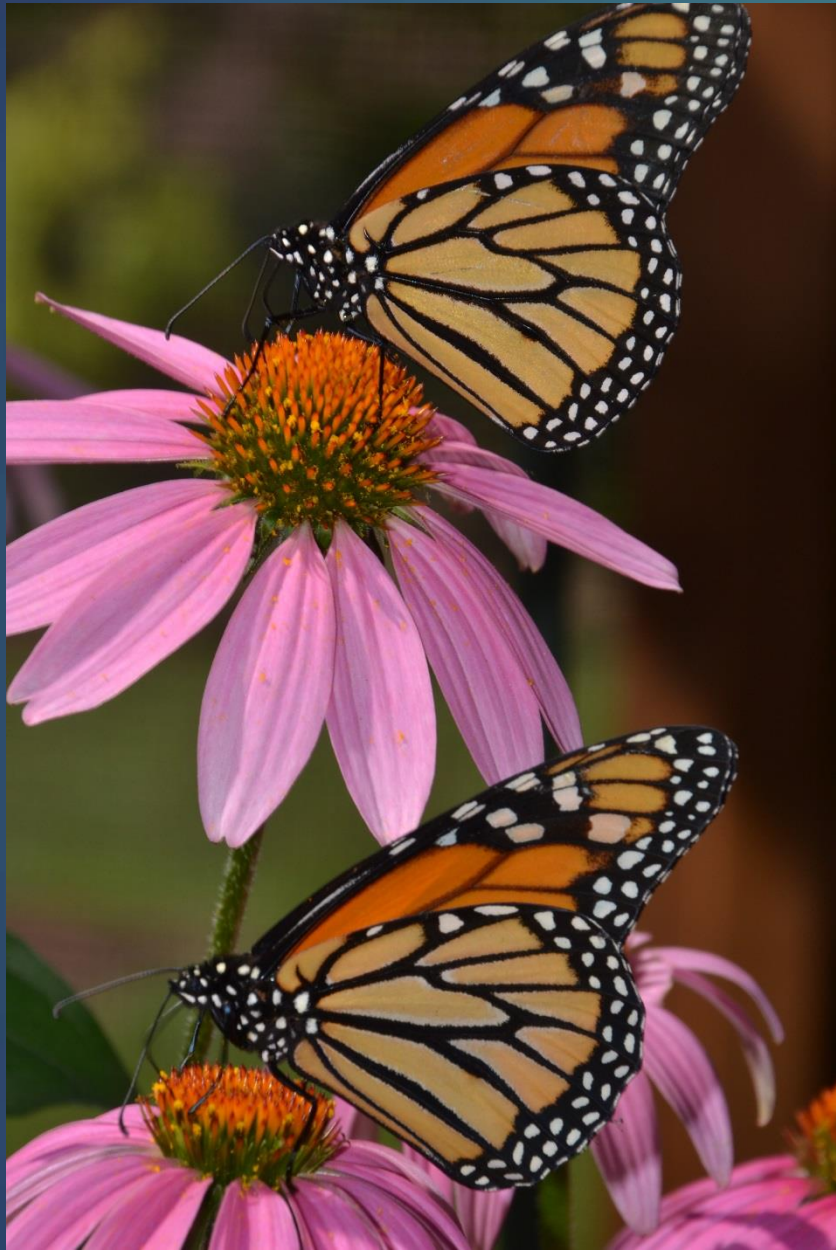


Preparing to pupate



Tiger Swallowtail

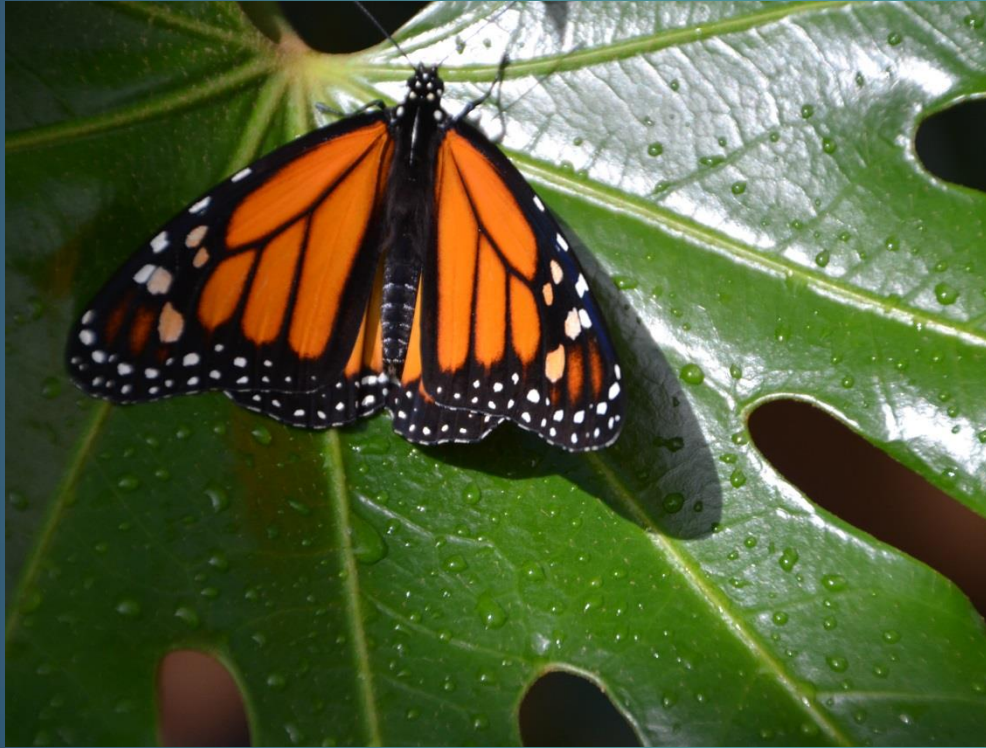




Monarch



Monarch



♀



♂

Monarch





Monarch



The Wonderful World of Caterpillars

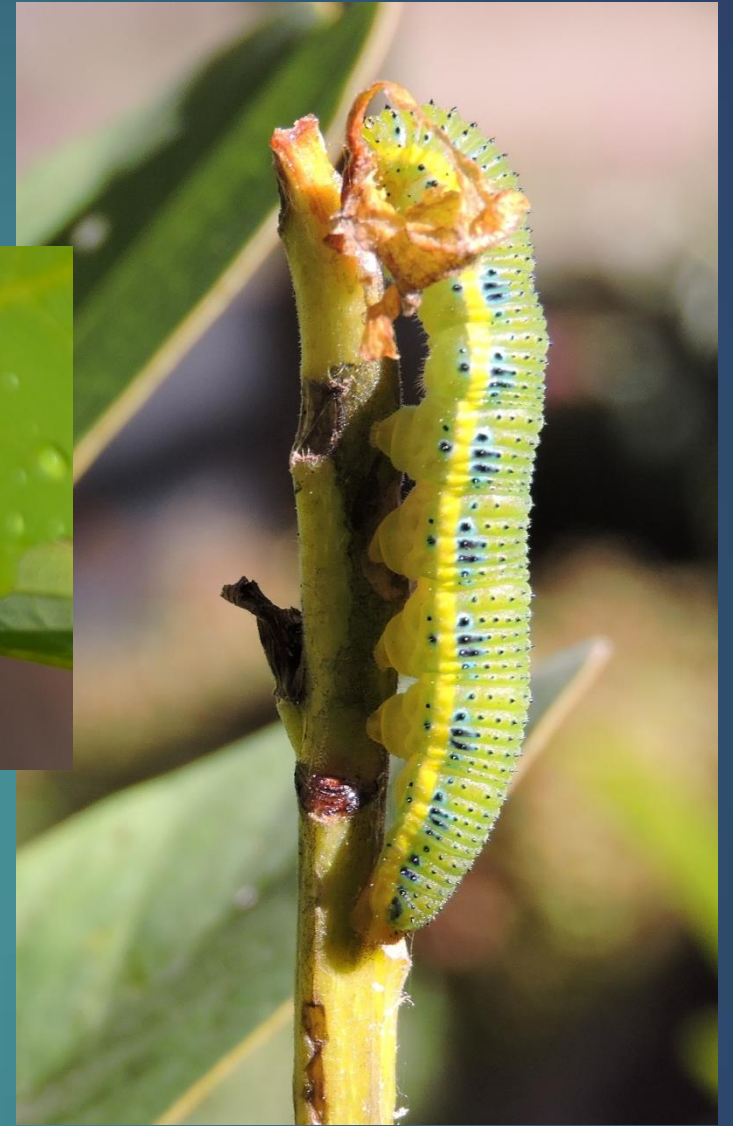
Defenses



Giant Swallowtail

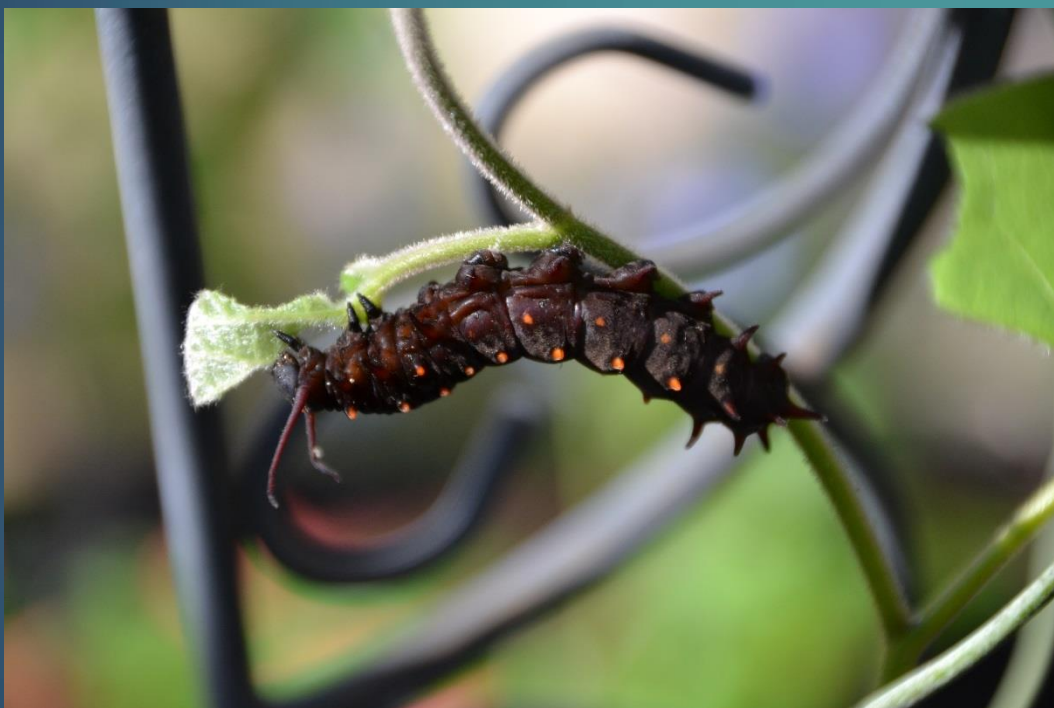
- Bird dropping defense
- Osmeterium – red structure – emits foul smell that repels predators
- Think he mimics anything?





Cloudless sulphur blends into leaf or stem

Spines!



Pipevine Swallowtail



Gulf Fritillary



Spicebush Swallowtail

- Fake eyes
- Looks like snake
- Rolls leaf to hide



© Jonathan Mays / Solent

The monarch diet of milkweed

renders it
poisonous
to
predators



Monarch caterpillars



Caterpillar of Eastern
Black Swallowtail

So why not
mimic the
appearance of
the monarch?



Black Swallowtail

The Wonderful World of Caterpillars

Other Interesting Aspects
(or Oddities)

Snacks!

- When caterpillars hatch, they, like other animals, eat the egg **shell** which is high in **nutrients**
- As caterpillars move through each instar stage, they slip out of their old skin which is also eaten



Butterfly Defenses

Startle coloration

Warning colors

Mimicry

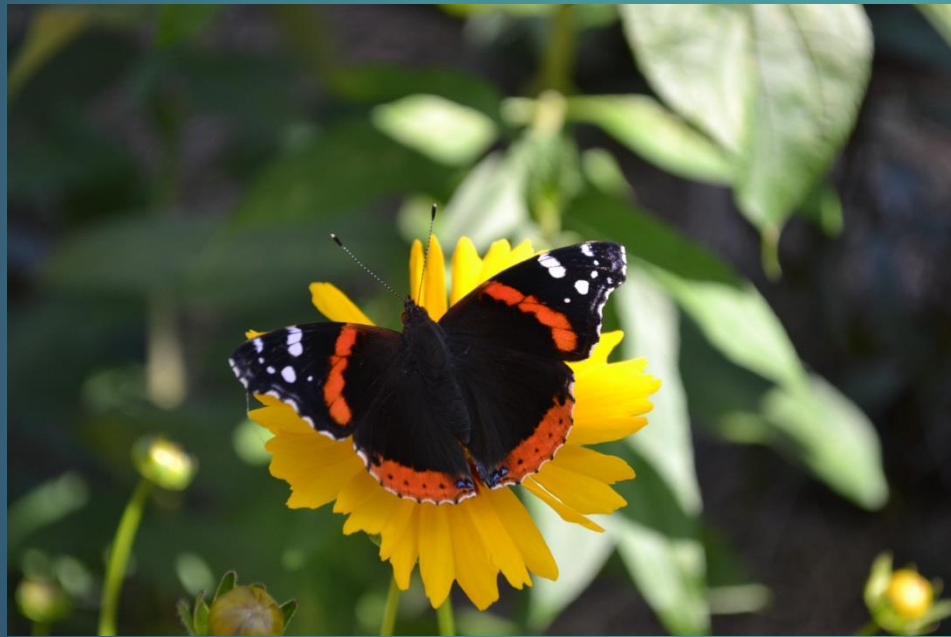
Buckeye – Startle



Warning Colors



Gulf Fritillary



Red Admiral



Mimicry



A butterfly's hard life

- Only about 5% make it to adulthood
- Man-made problems
 - Habitat destruction
 - Pesticides/herbicides
- Mother Nature
 - Predators
 - Disease
 - Weather

Butterfly House Operations

- No pesticide use
- Plants raised so we know no harmful chemicals have been used
- Keep plants healthy
- Work to prevent overpopulation
- Destruction of materials/dead insects
 - Freeze
 - Burn
- Screened house with plenty of circulation
- Search for and remove predators
- Remove spider webs

Raising Butterflies at Home

Cleanliness

- Bleach solution to clean containers
- Handle insects as little as possible
 - Hands have bacteria, soap, lotion
 - Caterpillars absorb through skin
 - When do have to move, try to use leaf or paintbrush



Raising Butterflies at Home

Caterpillar care

- Fresh food
 - Can be done several ways
 - Live plant in container
 - Use cut leaves and replace daily
 - Stems in water
 - Use different tools to keep foliage fresh



Raising Butterflies at Home

Caterpillar care

- Fresh food
 - Another option – floral picks
- Damp towel in container
(Caterpillars don't need water)



Raising Butterflies at Home

Caterpillar care

- Safe home
 - Mesh container helps to prevent parasitoid entry
 - Alternative – paint strainer over plant
 - Also, caterpillars can move easily and will attach readily to side or top
 - Plastic containers ok
 - Holes in top
 - Mesh cover
 - Tiny cats can be kept in petri dishes

Raising butterflies at home

Containers for caterpillars



Raising butterflies at home

Containers for caterpillars



Raising butterflies at home

Caterpillar care

- Clean home
 - Frass should be cleaned out daily
 - Easiest if keep something on bottom of container
 - Liquid released when pupate, so something to catch is helpful
 - Dispose of frass
- Not too many in one container
 - Easier to keep plant material clean
 - Prevent spread of disease

Raising Butterflies at Home

Respect Mother Nature – she has a process

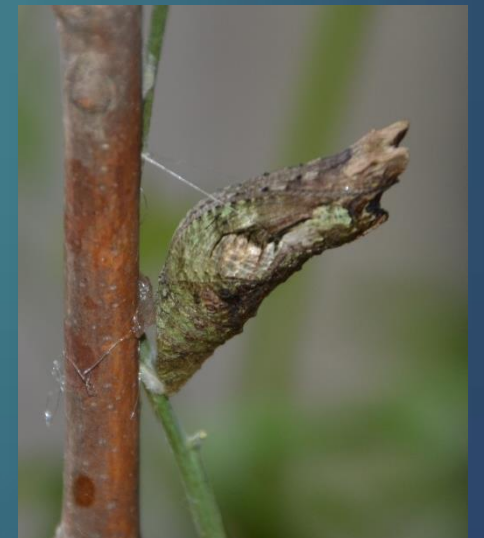
- Caterpillars often leave the host plant when getting ready to molt
 - Don't try to place back on host plant
 - Leave the caterpillar alone



Raising butterflies at home

Respect Mother Nature – she has a process

- When caterpillars are ready to pupate, they will again leave the host
 - Don't worry if it doesn't move for a day or so
 - Different species attach themselves different ways
 - After they attach themselves, it may be another day before it forms its chrysalis



Raising Butterflies at Home

Respect Mother Nature – she has a process

- Many will remain in the chrysalis stage for about 2 weeks
 - Many change color the day before emerging
 - When do eclose, they have important things to take care of
 - Again, DO NOT move them
 - Allow them 2-4 hours before releasing
 - If it's late in the day or the weather is bad, they can be released the next morning

Raising Healthy Butterflies

Butterfly nuts bring them in from the garden to a sheltered place

- Many kinds of containers
- Important to protect from predators
- Some predators even eat the eggs
 - Ants, spiders
- Spiders, lizards, birds love the caterpillars
- Parasitoids – lay eggs in the egg or in the larva
 - Those eggs then develop within the larva to emerge later

Infected Monarch Caterpillar



Photos courtesy of Jack Bardwell

Exit Holes in Swallowtail Chrysalis



Photo courtesy of Jack Bardwell

Predators

- Hanging like this, probably something like a soldier bug
- Has proboscis that sucks out the fluids

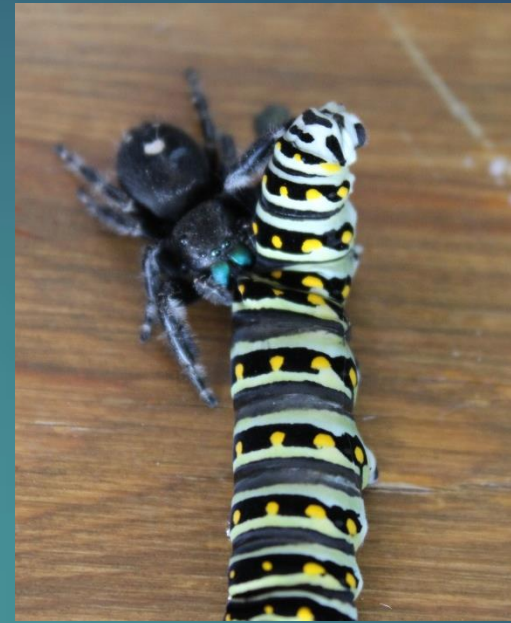


Predators

Wasps



Spiders



Predators

All stages have predators, even eggs



In a spider's trap

So this is why we raise some in protected areas

- Even then, it's not foolproof
- Try not to be dismayed when some don't make it
- Remember we are working with Mother Nature
- Those you do save will help to increase declining populations

Favorite Reads

The Life Cycles of Butterflies

by Judy Burris and Wayne Richards

The Family Butterfly Book

by Rick Mikula

Arkansas Butterflies and Moths

by Lori Spencer

Bringing Nature Home

by Doug Tallamy

Favorite Websites

Monarch Watch

Good information

Tagging

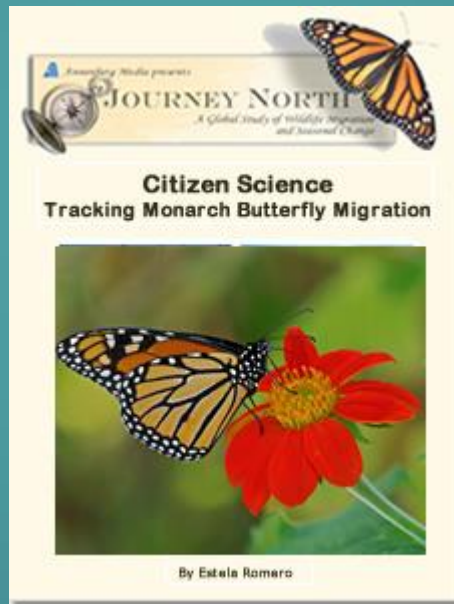
Journey North

Wonderful information

Slide shows

Citizen Science

(Details on your handout)



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