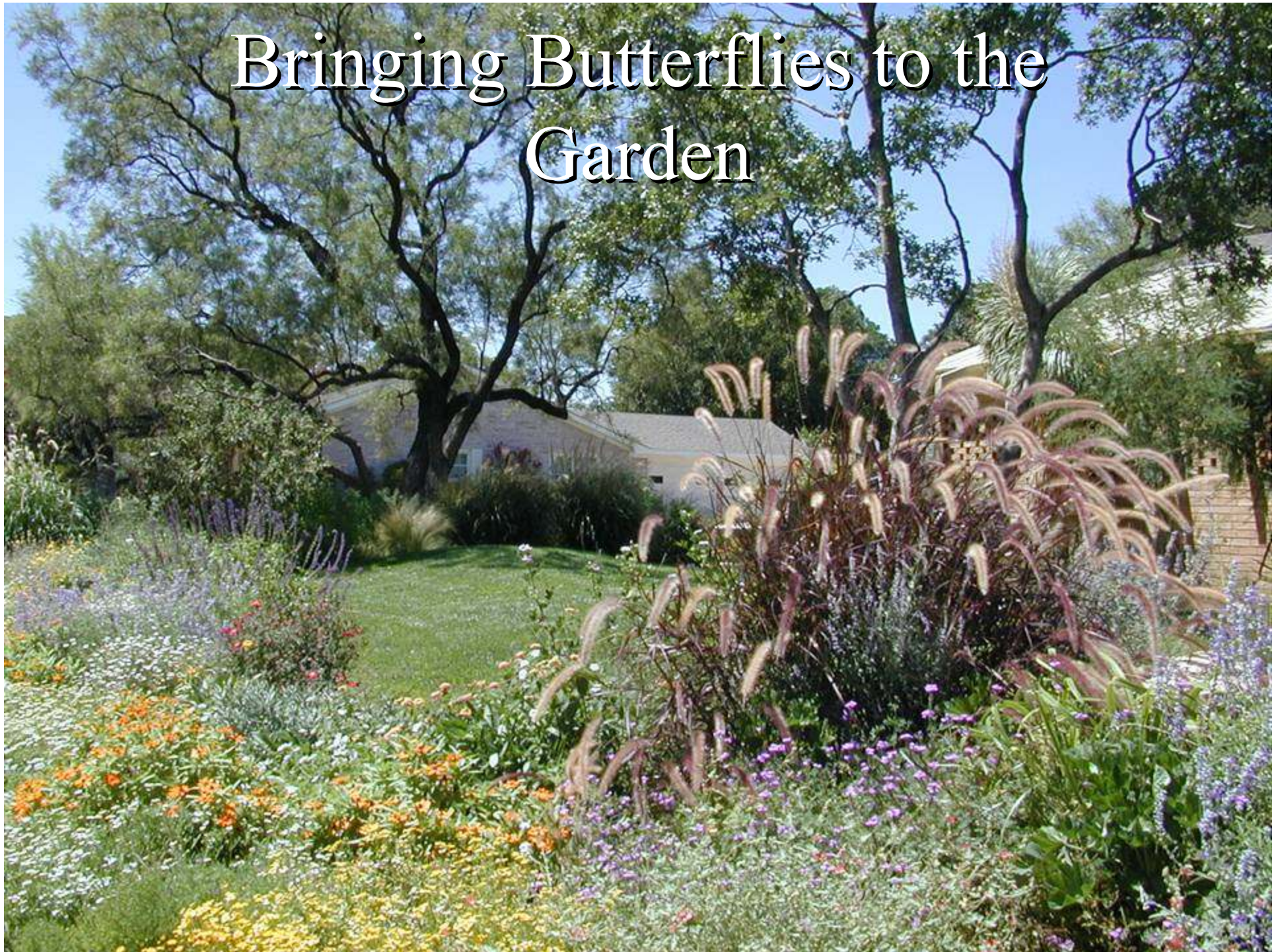


Bringing Butterflies to the Garden





Agenda

- Butterfly diversity & Identification
- Butterfly biology & Behavior
 - Life cycle, Vision, Taste, Wing color, Mating, Temperature control, Sleep, Defense
- How to attract butterflies
 - How flowers attract butterflies
 - Non flower attractants
 - Larva host plants
- Top butterfly plants



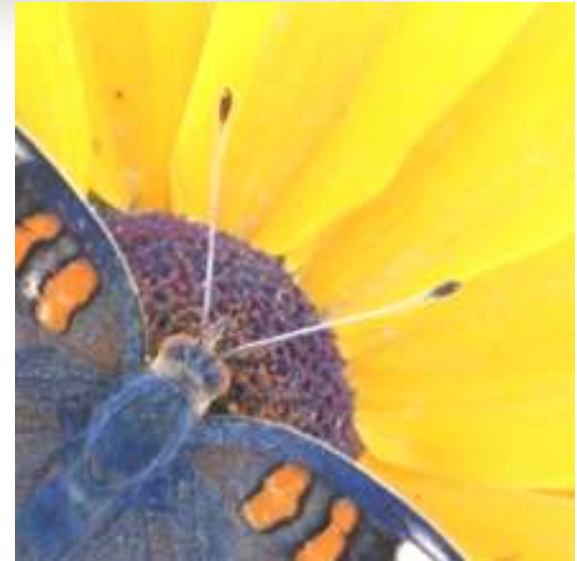
Natural History of Butterflies

- Butterfly Diversity in Texas
- Unbelievable!
 - 490+ species (700 species in the US and Canada)
- Why so many?
 - Location
 - Mexican, Central & South American
 - Western US
 - Eastern US

Butterfly Identification

■ Adults

■ Clubbed antennae

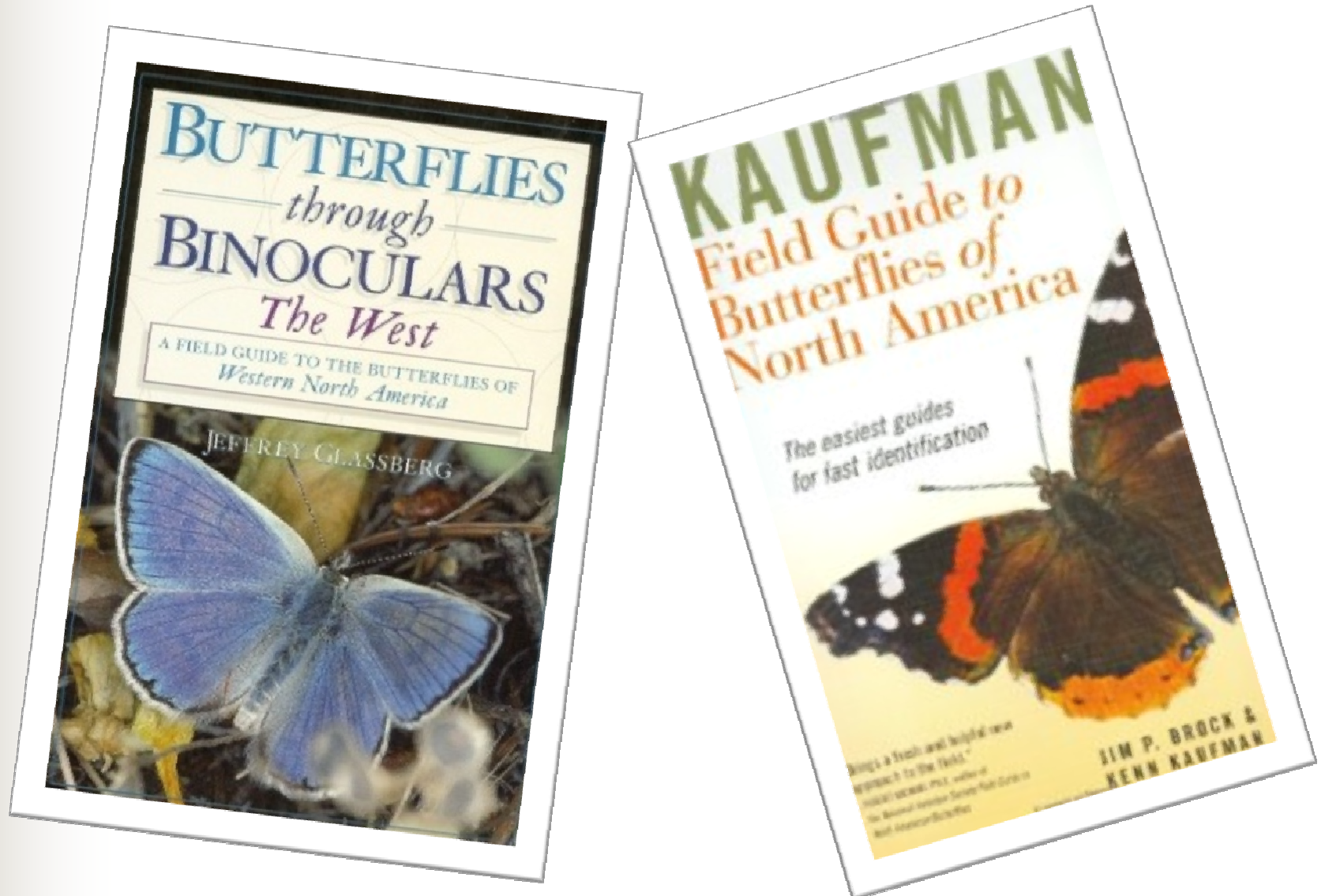


Butterfly Identification

- Narrow bodies
- Generally rest with wings closed over back
- Fly during daylight
- Do not spin cocoons



Great reference books for adult butterfly ID

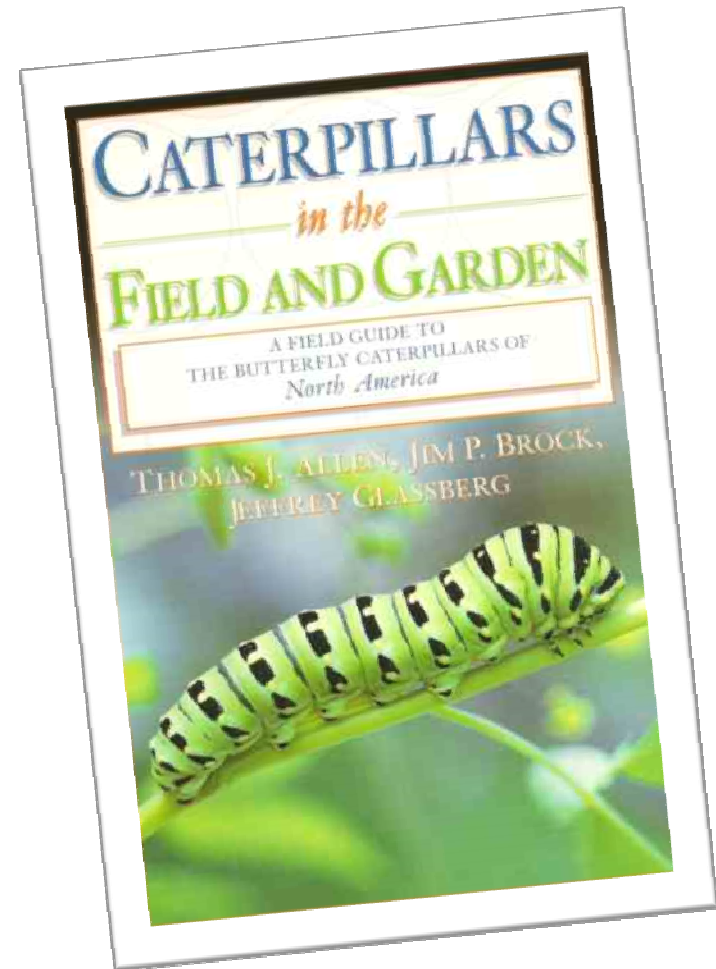


Butterfly Identification

- Larvae
 - Difficult
 - Requires experience and a good reference book.



Excellent reference book for caterpillar ID



Life History

- Life Cycle
 - Complete Metamorphosis



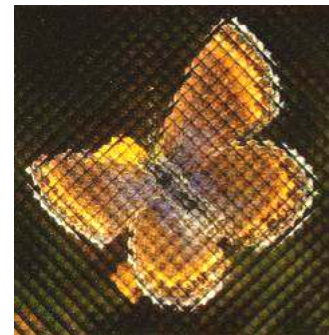
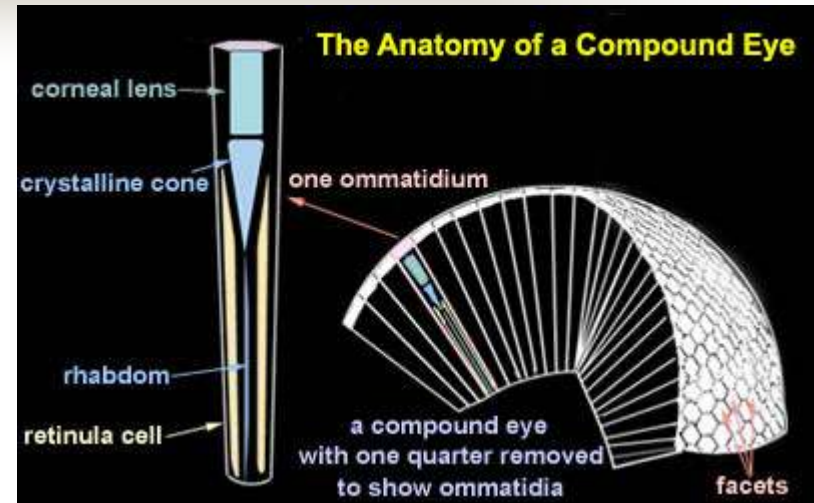
Butterfly Vision

- Essential for:
 - Communication
 - mating
 - Food recognition
 - Protection
 - From predators & environment



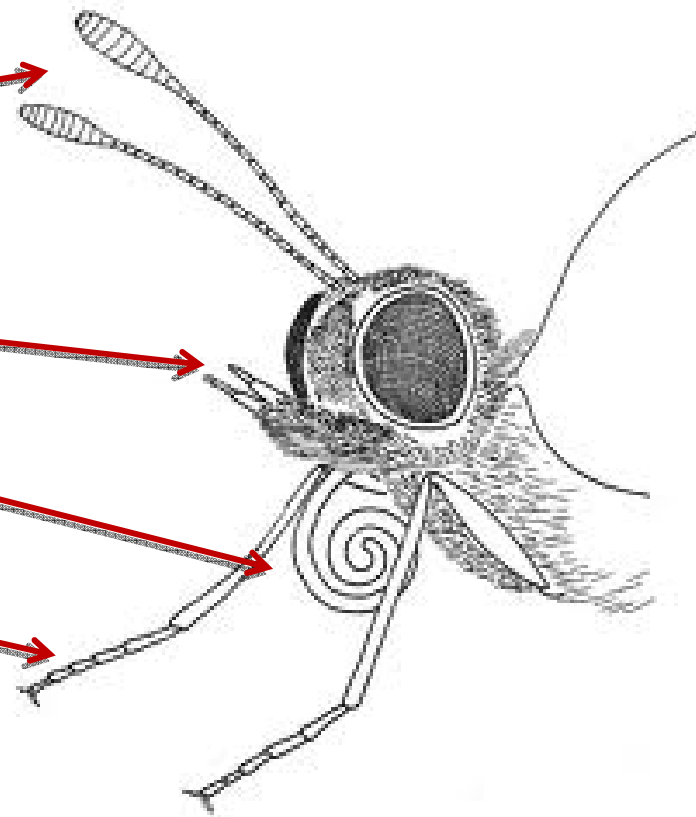
Butterfly Vision

- Compound eyes
 - Many facets
 - Good motion detectors
 - Fixed focus
 - Poor long distance vision
 - Good up-close vision
- Color vision
 - Greatest color range known
 - Ultraviolet to red



Butterfly Taste

- Antenna
- Palps
- Proboscis
- Tarsi
(butterfly feet)



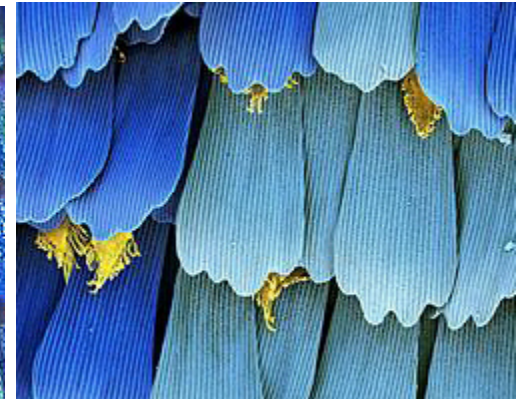
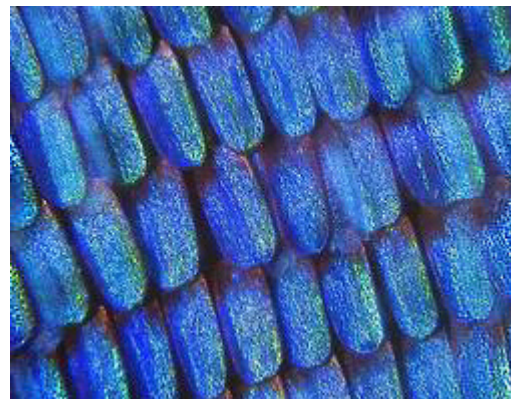
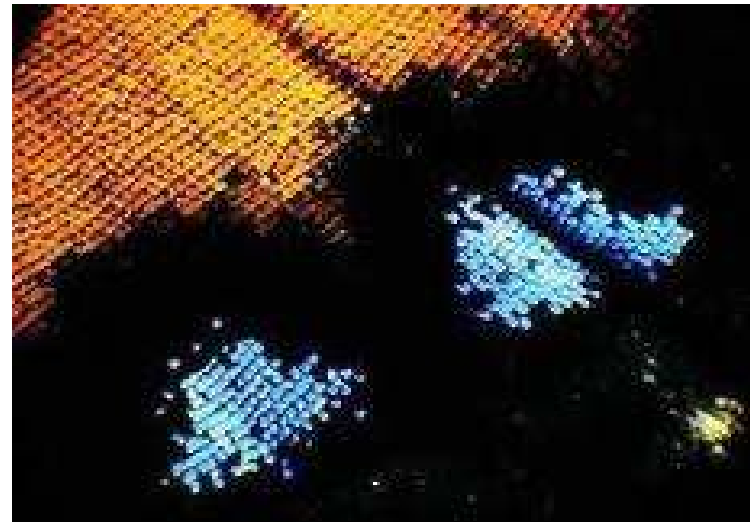


Cassius Blue Tasting the Goods



Butterfly Wings

- Scale covered
- Colors
 - Pigmented (orange, red)
 - Larvae food
 - Internal pigment production
 - Structural
 - Bubbles (white)
 - Scale ridges and grooves
 - Reflection/refraction
 - Metallic colors





Butterfly Sex

- Color
- Pheromone (chemical scent)
- Males
 - Scent scale
 - Androconia (Greek: meaning male dust)
 - Fragrance likened to various flower scents
 - Wild rose, verbena, meadowsweet and others
 - Side note: One way flowers attract butterflies



Temperature Control

- Body temperature needed=80+ degrees
 - Basking
 - Doral
 - Lateral
 - Conductive
- Excessive heat
 - Close wings
 - Turn into sun
 - Retreat to shade



Butterfly Sleep

- Decrease in solar radiation
 - Triggers roosting behavior
 - Search for safe location
 - Different roosting behavior for different species
 - Black swallowtail
 - Prefers west facing locations
 - Some wood nymphs
 - Prefer east facing locations

Butterfly Defenses

- Concealment
 - Blending with environment
- Mimicry
 - Resembling predators
 - Distasteful animals
 - Non food objects



Batesian mimicry

- Resemblance of a palatable species to an unpalatable species : Pipevine swallowtail ---- Black swallowtail



Butterfly Defenses

- Warning coloration
 - Bright contrasty colors
- Physical attributes
 - Many branched sharp spines
 - Chemical discharge



Defenses

- Bright Eyespots
- Tails



How to attract butterflies

- **Provide for butterflies needs**
 - Food and shelter
- Learn area butterflies
- Choose plants that will grow in your area
- Before planting, Plan on paper!



Nectar=Butterflies

- Choose good nectar producing plants
 - Buddlia (butterfly bush)
 - Verbena
 - Abelia
 - Lantana
 - Saliva species (sages)
 - Purple coneflower
 - Rudbeckia species (black-eyed Susan)
 - Vitex



Flower Color

- Most Popular
 - 1st Purple, white, yellow and pink
 - 2nd Blue
 - 3rd Orange and Red



Other attractiveness features

- Nectar guides
 - Visual guide markings direct insect to nectar source
- Fragrance
 - Special scent that attracts insect to nectar source
- Flower shape
 - Numerous small flower clusters preferred over single large or solitary flowers



Non-flower Attractants

■ Natural Sources

- Rotting fruit
- Dung
- Tree sap

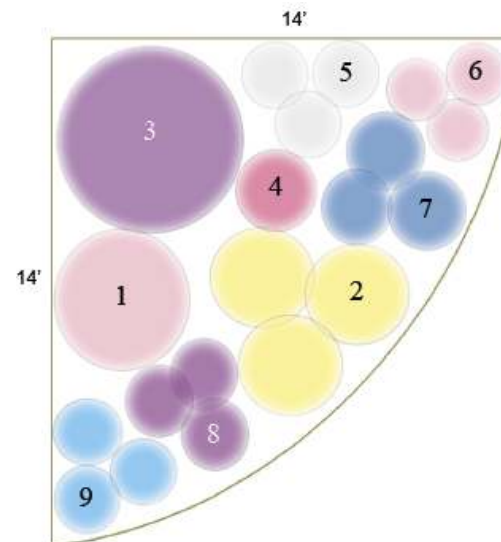
■ Artificial Sources

- Sugaring:
 - 1 can beer
 - 1lb brown sugar
 - ½ cup molasses
 - Over-ripe fruit
 - Banana, peaches



Design Ideas

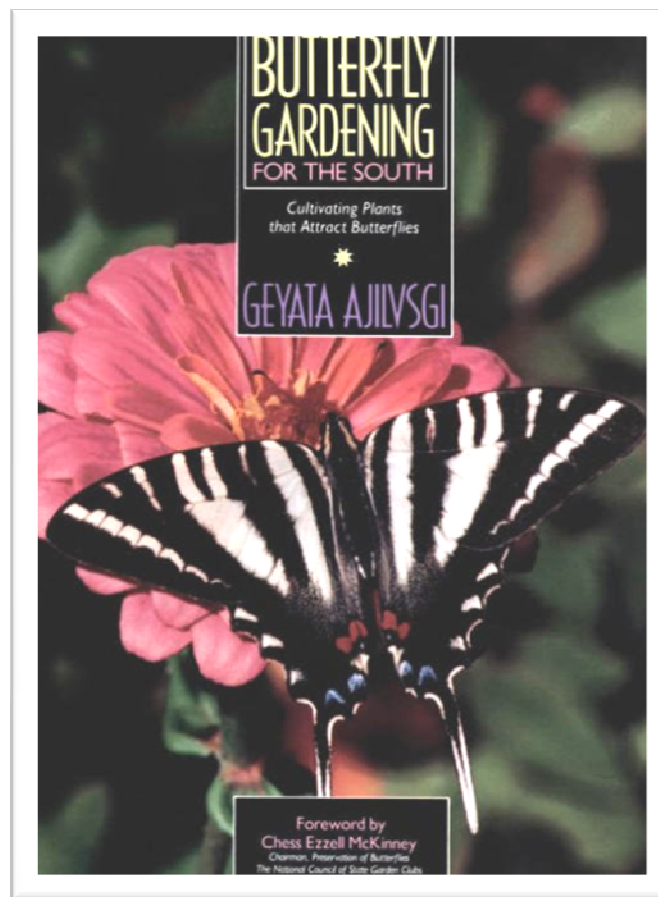
- Small to large
- Simple to complex



- 1 - Lantana 'Pink Caprice' (1)
- 2 - Lantana 'New Gold' (3)
- 3 - Butterfly Bush 'Purple' (1)
- 4 - Sedum 'Autumn Joy' (1)
- 5 - Phlox 'David' (3)
- 6 - Yarrow 'Pink' (3)
- 7 - Veronica 'Goodness' (3)
- 8 - Verbena 'Homestead' (3)
- 9 - Pincushion Flower 'Blue' (3)

Plant this pie-shape butterfly garden in a fence corner, the corner between your patio and deck or any other place a corner garden will work.

Excellent Butterfly Gardening reference



Top 10 Butterfly Plants

- How to Choose Plants
- Attractiveness to butterflies
 - Experience
- Maintenance
 - How easy to grow
- Growth habits
 - Height
 - Hardiness
 - Competitiveness
 - Length of blooming season



Indigo Spires Sage

- 3-4 ft
- Perennial zones 8>
- Blooms mid-June to Frost
- Full sun



Blue Mist Flower (*Eupatorium greggii*)

- 2+ ft
- Perennial
- Blooms late spring to frost
- Potentially invasive



Butterfly Bush (*Buddleia* spp)

- 4-8+ft
- Perennial
- Blooms spring to frost
- Many colors



Coral Vine *Antigonon leptopus*



Butterfly Milkweed (*Asclepias tuberosa*)

- 2-3ft
- Perennial
- Blooms early summer to frost
- Prone to aphid and milkweed bugs



Black-eyed Susan (*Rudbeckia* spp.)

- Depending on variety
 - 12in-3ft
 - Annual, perennial, biennial
 - Flowers 3-7in
 - Late spring to fall (perennial types)



Lantana

- Spreading shrub, 2ft
- Perennial
- Flowers from spring to frost
- Variety of colors



Cherry Sage (*Salvia greggii*)

- Small shrub, about 3ft x 3ft
- Perennial. Evergreen in warmer zones
- Variety of colors
- Blooms spring to frost



Silver Lace Vine (*Polygonum aubertii*)

- Fast growing, 12-15ft
- Arbors, fences, barns, etc.
- Flowers from spring to frost



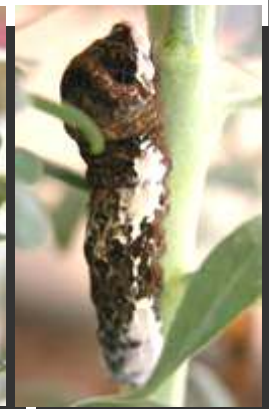


White Mist Flower (*Eupatorium havanense*)-Late fall bloom



Butterfly Larvae Plants

- 1. Rue (*Ruta graveolens*), Giant and Black Swallowtails
- 2. Passion Flower Vine (*Passiflora* spp), Variegated Fritillary
- 3. Black Dalea (*Dalea frutescens*), sulfur butterflies



More Butterfly Larva Plants

- Milkweeds (*Asclepias* spp),
Monarch, Queen butterfly
- Pipevine (*Aristolochia* spp)
Pipevine Swallowtail



Internet Resources

- North American Butterfly Association

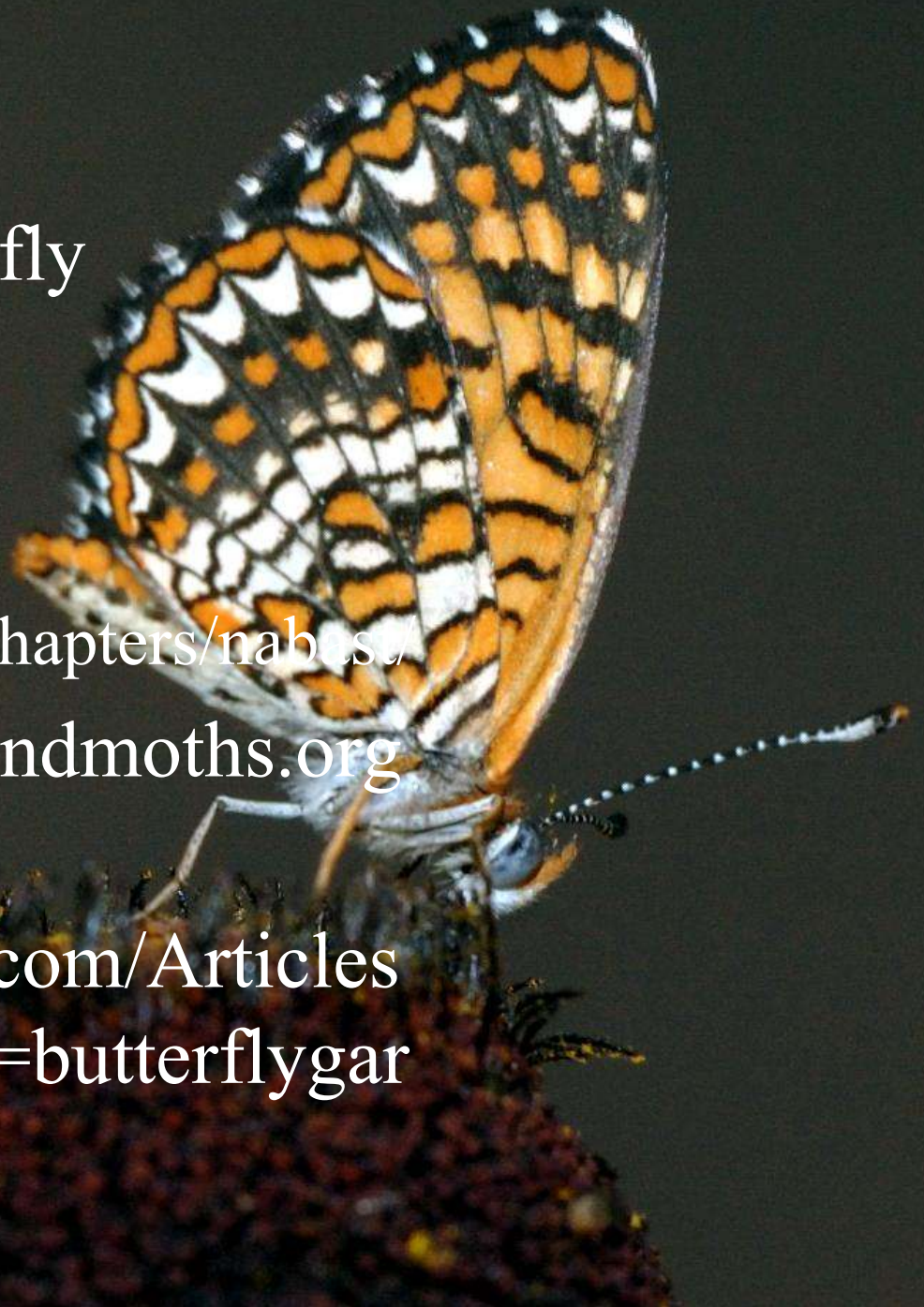
- <http://www.naba.org>

- South Texas Chapter

- <http://www.naba.org/chapters/nabuts/>

- <http://www.butterfliesandmoths.org/>

- <http://butterflywebsite.com/Articles/constructlist.cfm?type=butterflygardening>



Two-Tailed Swallowtail



Black Swallowtail



Giant Swallowtail



Pipevine Swallowtail



Theona Checkerspot



Bordered Patch



Variegated Fritillary



Southern Snout Butterfly



Texas Crescentspot



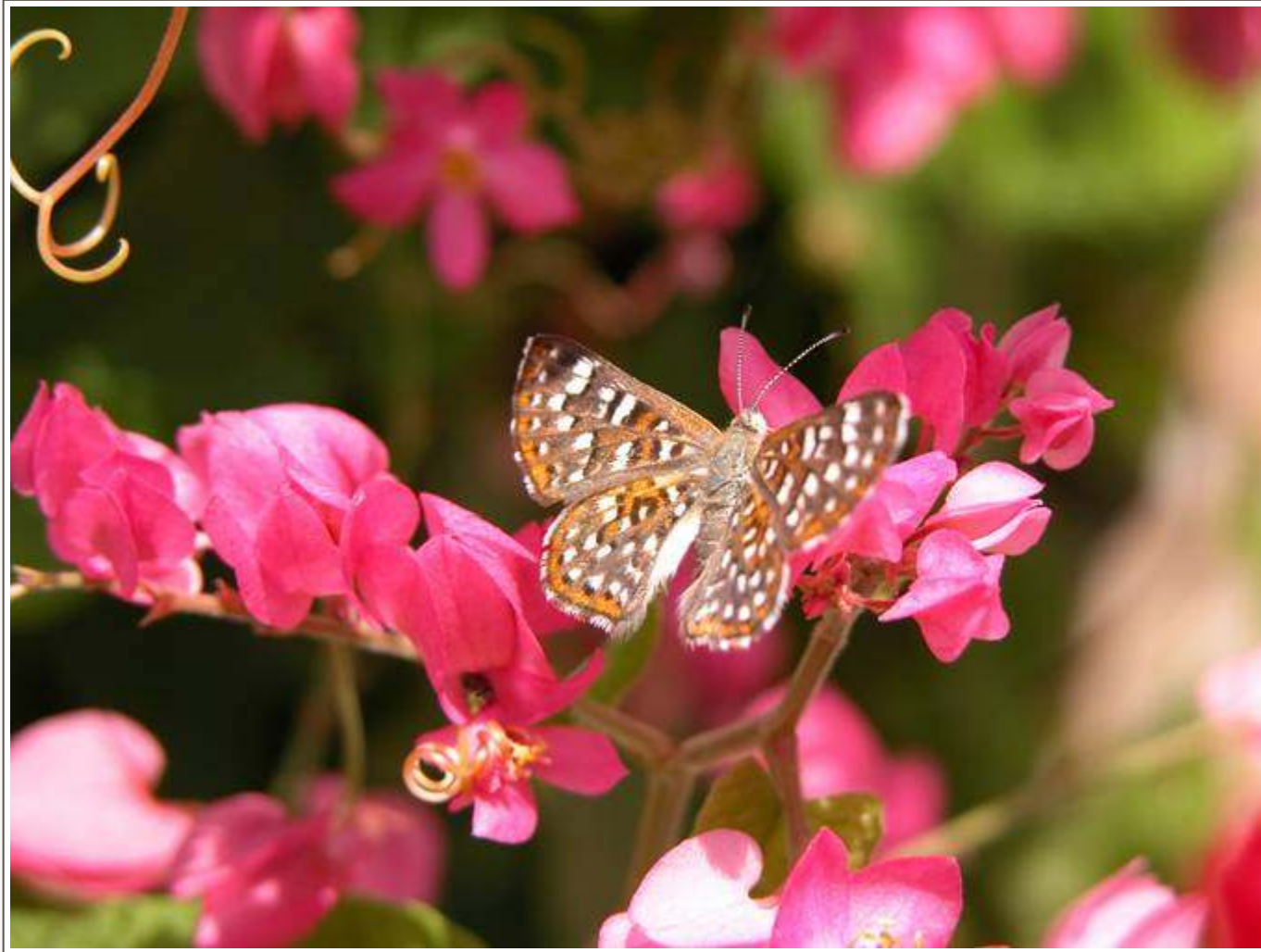
Pearl Crescent



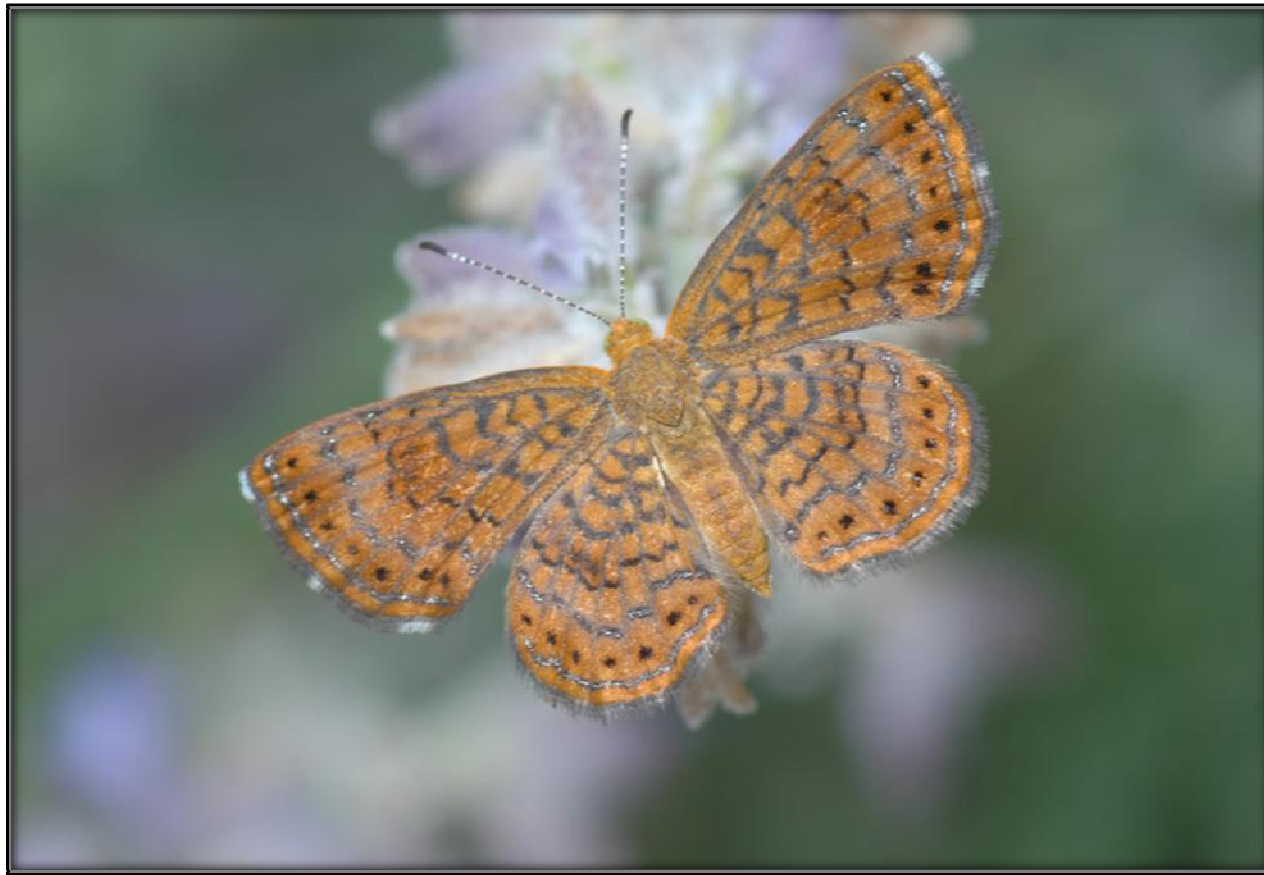
Malachite



Mesquite Metalmark



Rawson's Metalmark



Gray Hairstreak



Reakirt's Blue



Queen



Monarch



Southern Dogface



Tailed Orange



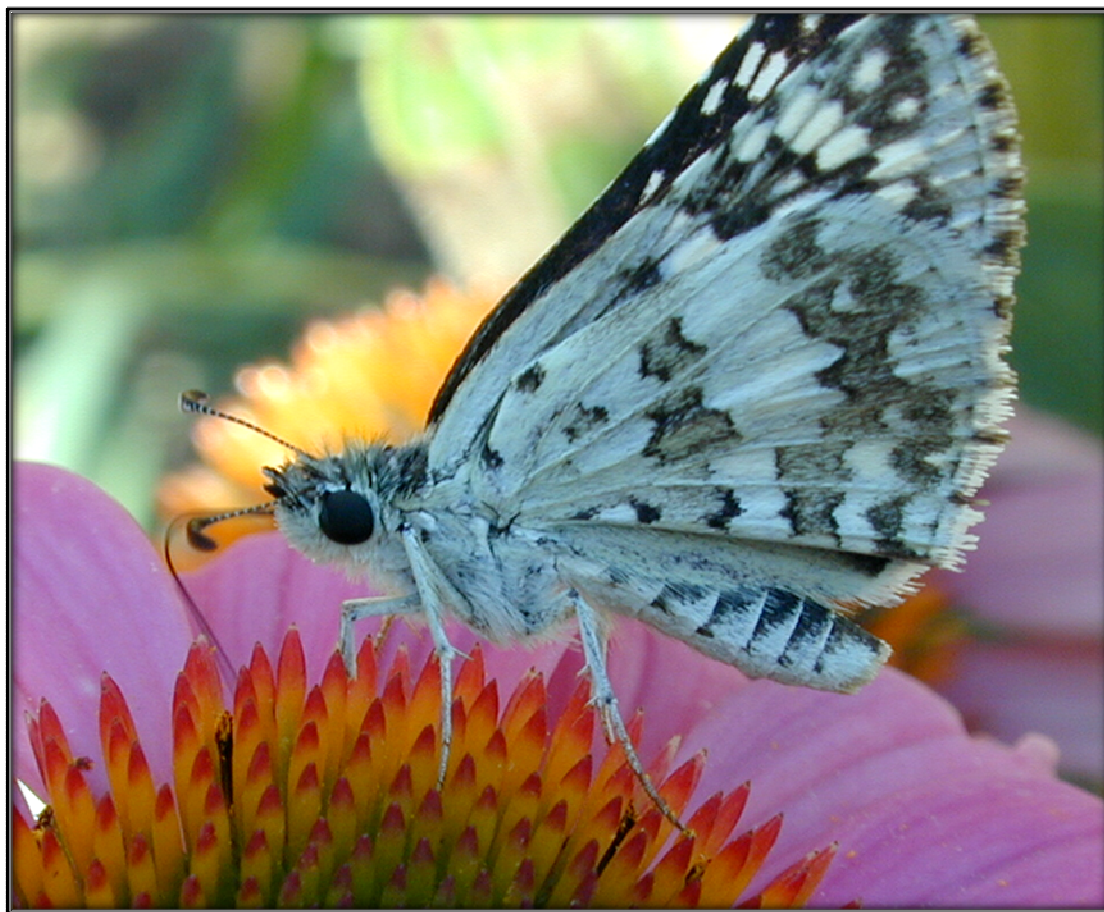
Sleepy Sulfur



Skipperling



Checkered Skipper



Olive-clouded Skipper

