

Backyard Dramas in Three Acts

Evolution and Ecology in your Garden

A bit about my research & teaching



Act 1 - Caterpillar & Host

Life Cycle

Host plant defense(s)

Butterfly Costs/Benefits



Act 1 - Caterpillar & Host

Act 2 – Diversity drives Diversity

Pollinators

Selfish plants, Thieving bugs

Complexity



Act 1 - Caterpillar & Host

Act 2 – Diversity drives Diversity

Act 3 – Predation and Food Web

Who is the prey...who is the predator?

Trigger Warning –
Spiders and Bugs

Act 1 - Caterpillar & Host



Monarch & Common Milkweed



Gulf Fritillary & Passion Vine (Maypop)

Lepidopteran Life Cycle



Monarch Butterfly

Caterpillars & Butterflies



Monarch Caterpillar & Butterfly



Wavy-Lined Caterpillar & Moth



Sulphur Caterpillar & Butterfly



Pipevine Swallowtail Caterpillar & Butterfly



Luna Caterpillar & Moth



Black Swallowtail Caterpillar & Butterfly



8-Spotted Forester Caterpillar & Moth

Passion vine (*Passiflora incarnata*)



Gulf Fritillary (*Agrualis incarnata*)



— Cost – Impacts Survival & Reproduction (fitness)

+ Benefit – Parasite/Predator gains resources

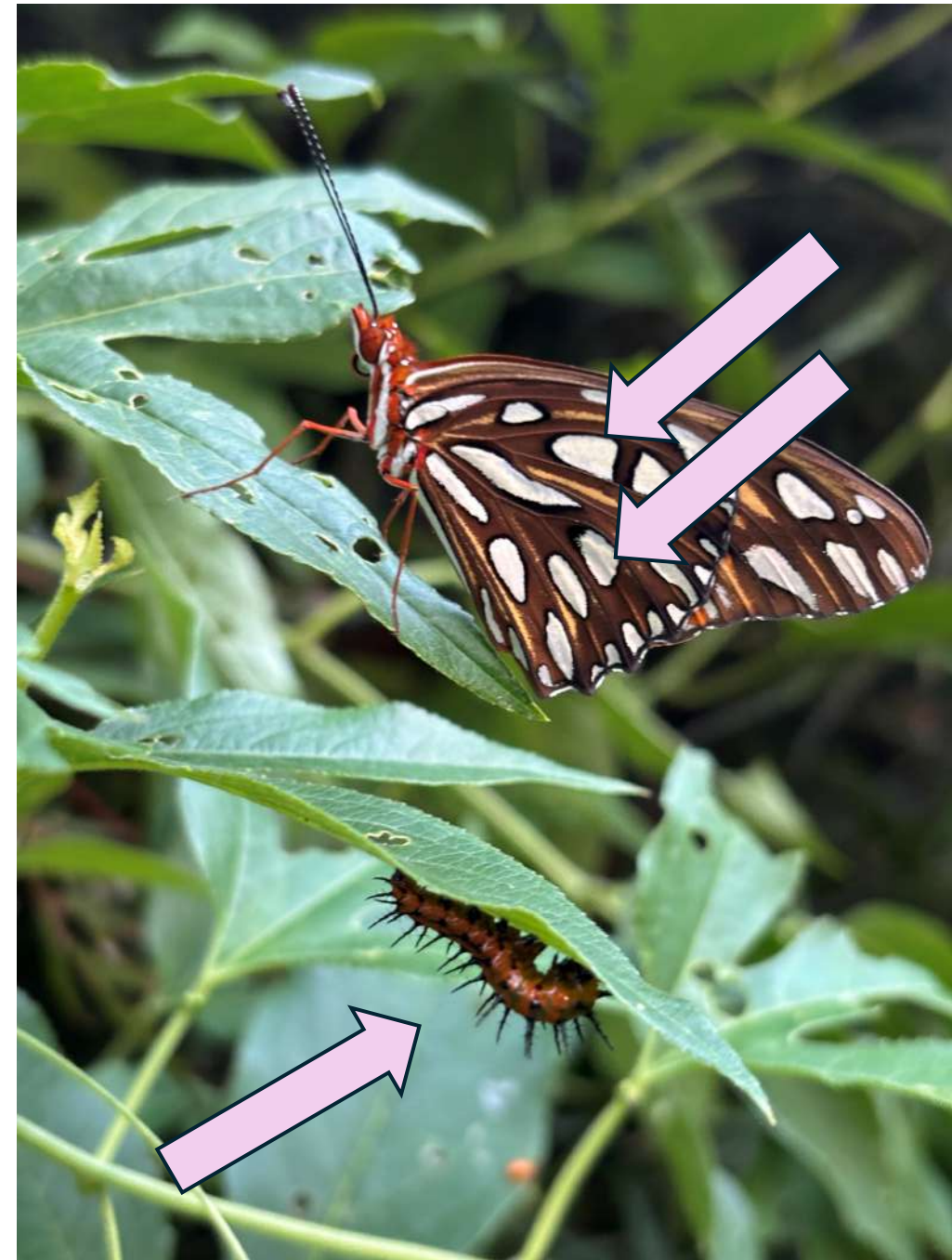
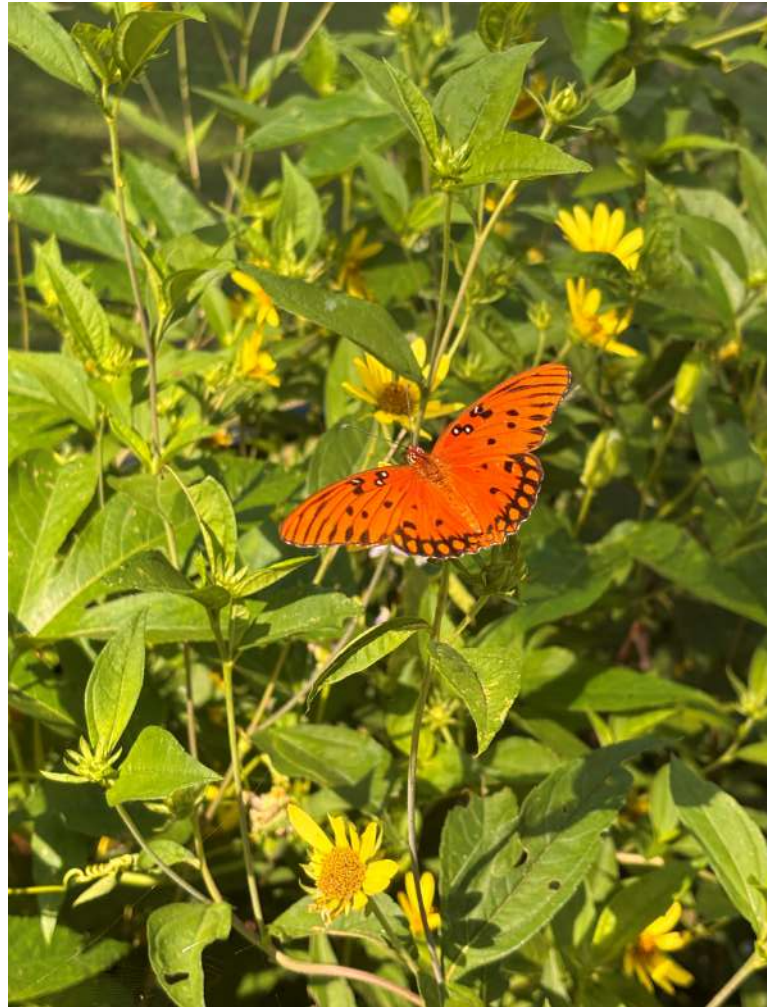
Identify Gulf Fritillary



Aposomatic

Synthesize Toxin

Cyanogenic
Glycosides
(CNgl's)

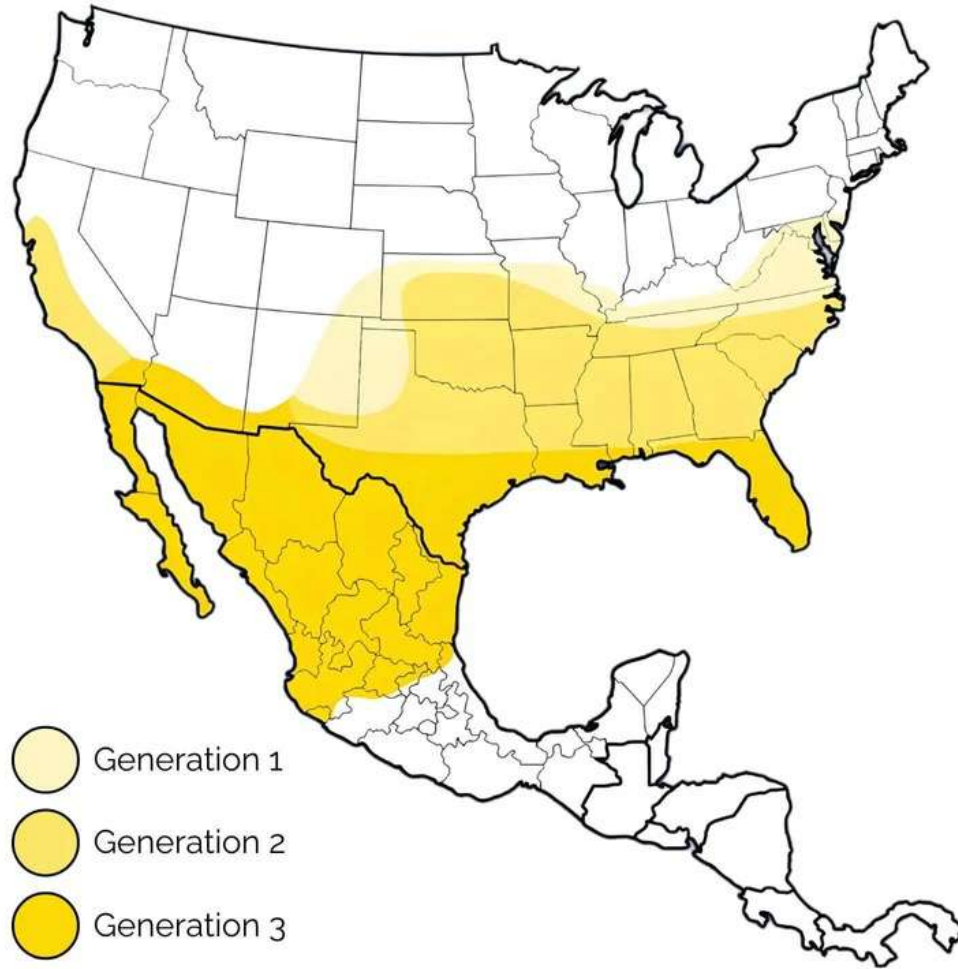


Distribution



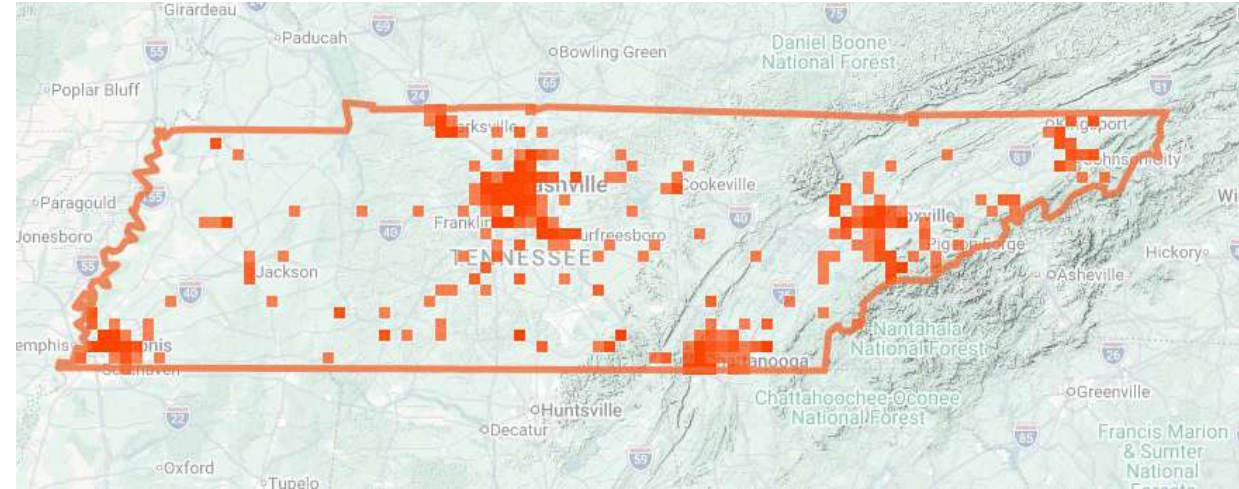
Population Variation

Seasonal Migration

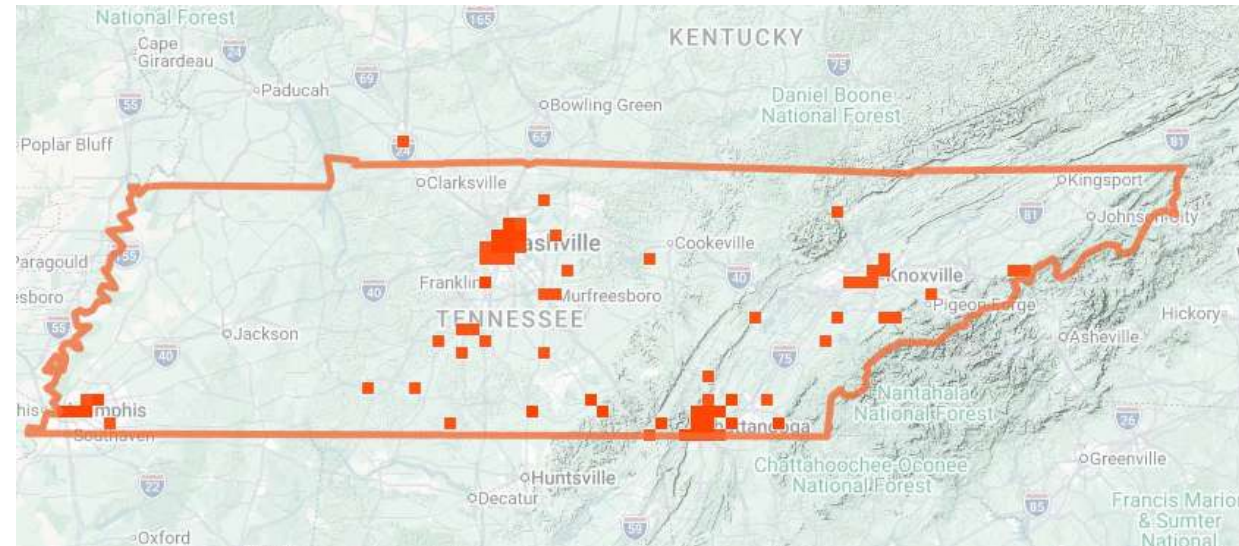


Annual Variation

2025 – 888 observations



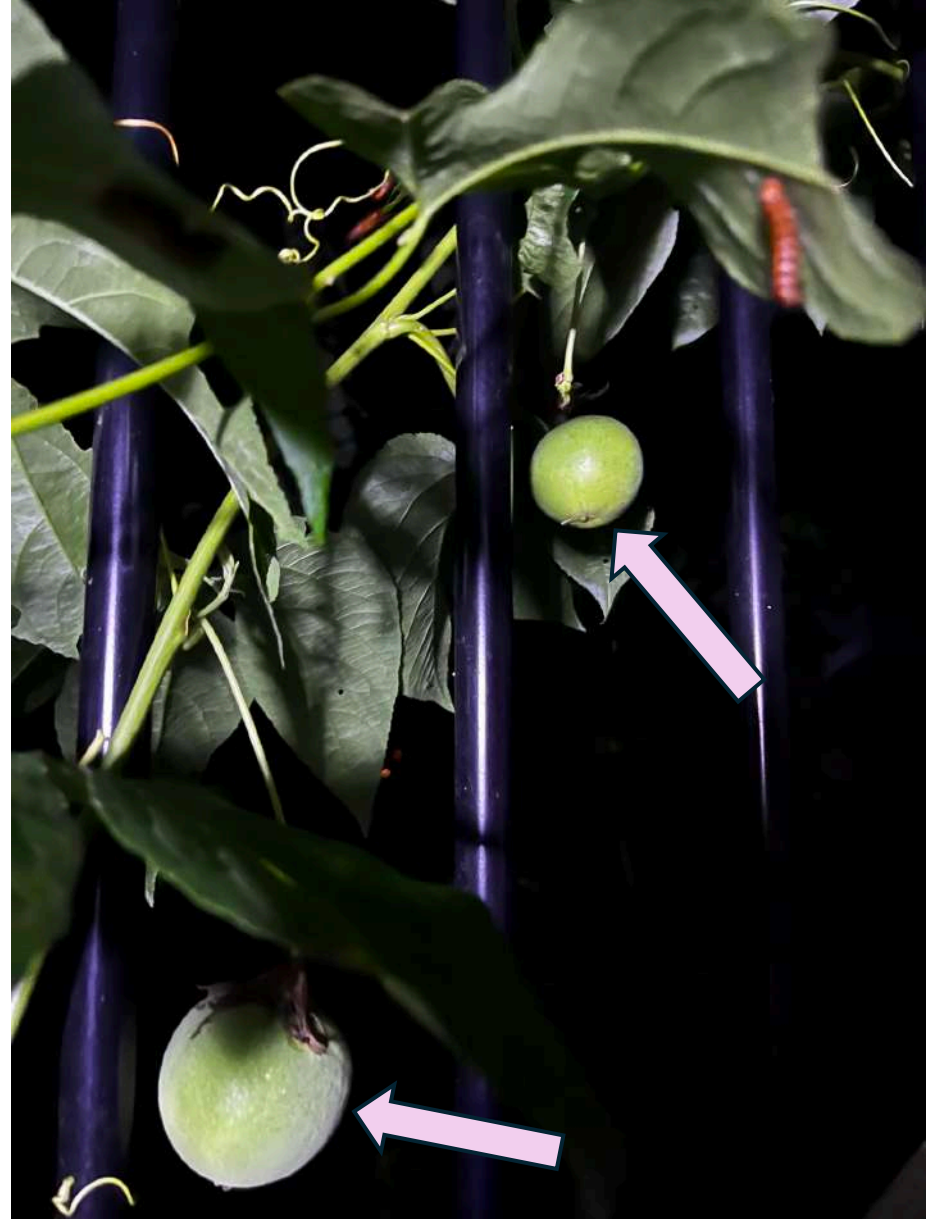
2026 – 164 observations



Passiflora incarnata(MayPop)



Native
Edible fruit



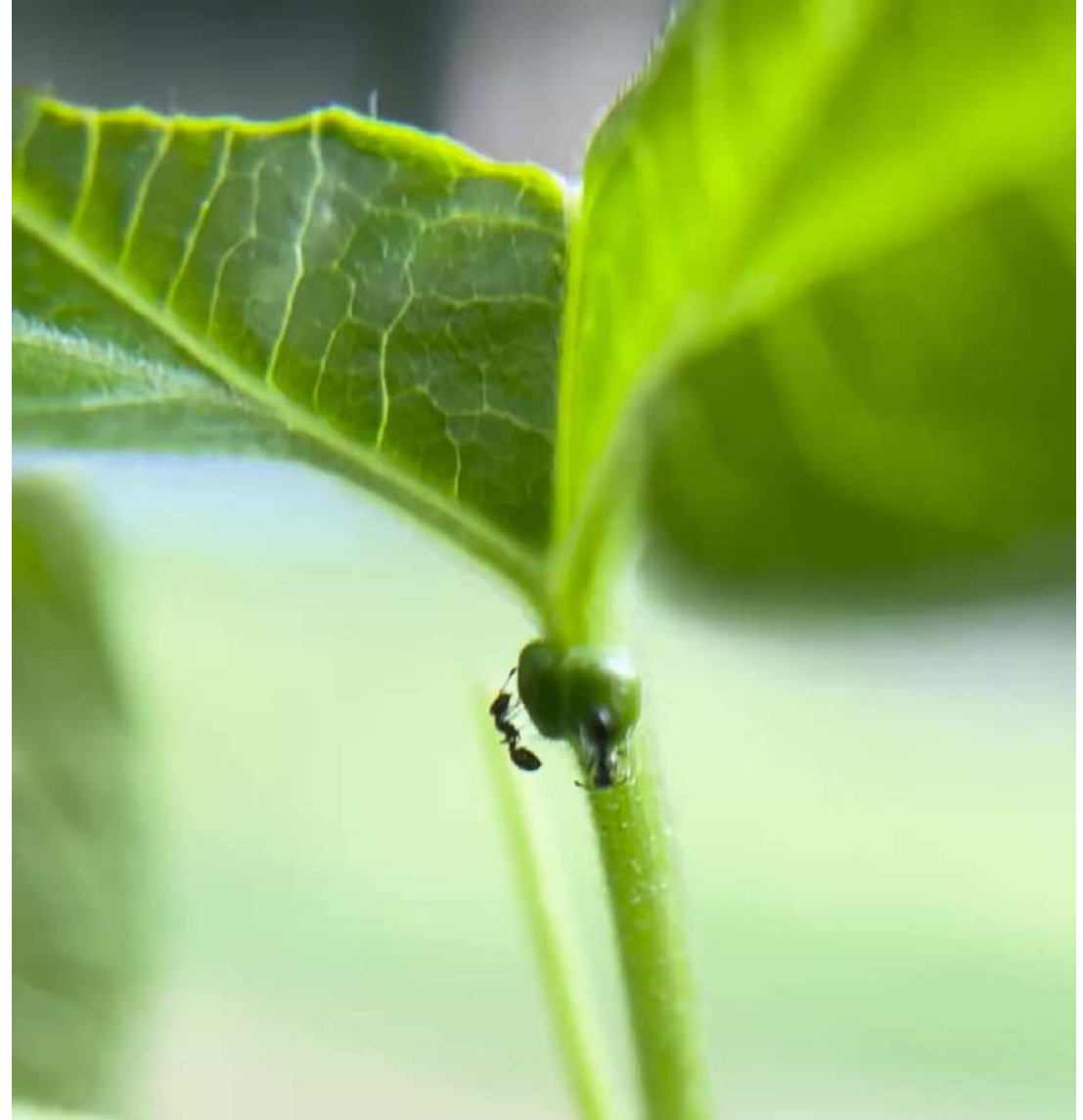
Passiflora incarnata(MayPop)

Nectararies



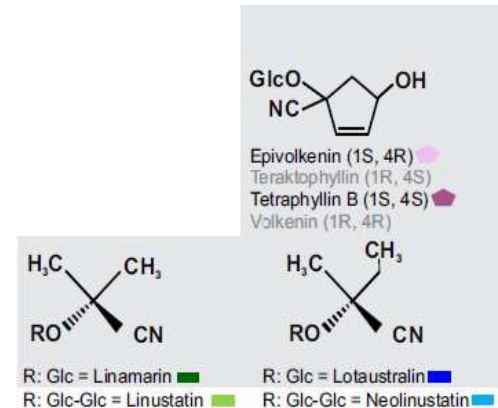
Passiflora incarnata(MayPop)

Nectaries



Passiflora incarnata(MayPop)

Nectaries
Carpenter Bees
CNgls



CNgls found in both *Passiflora* and heliconiines



Andromonoecious

Hermaphroditic flower





Meet Cute



The first meal



Very hungry...you know



That night he had a stomachache!

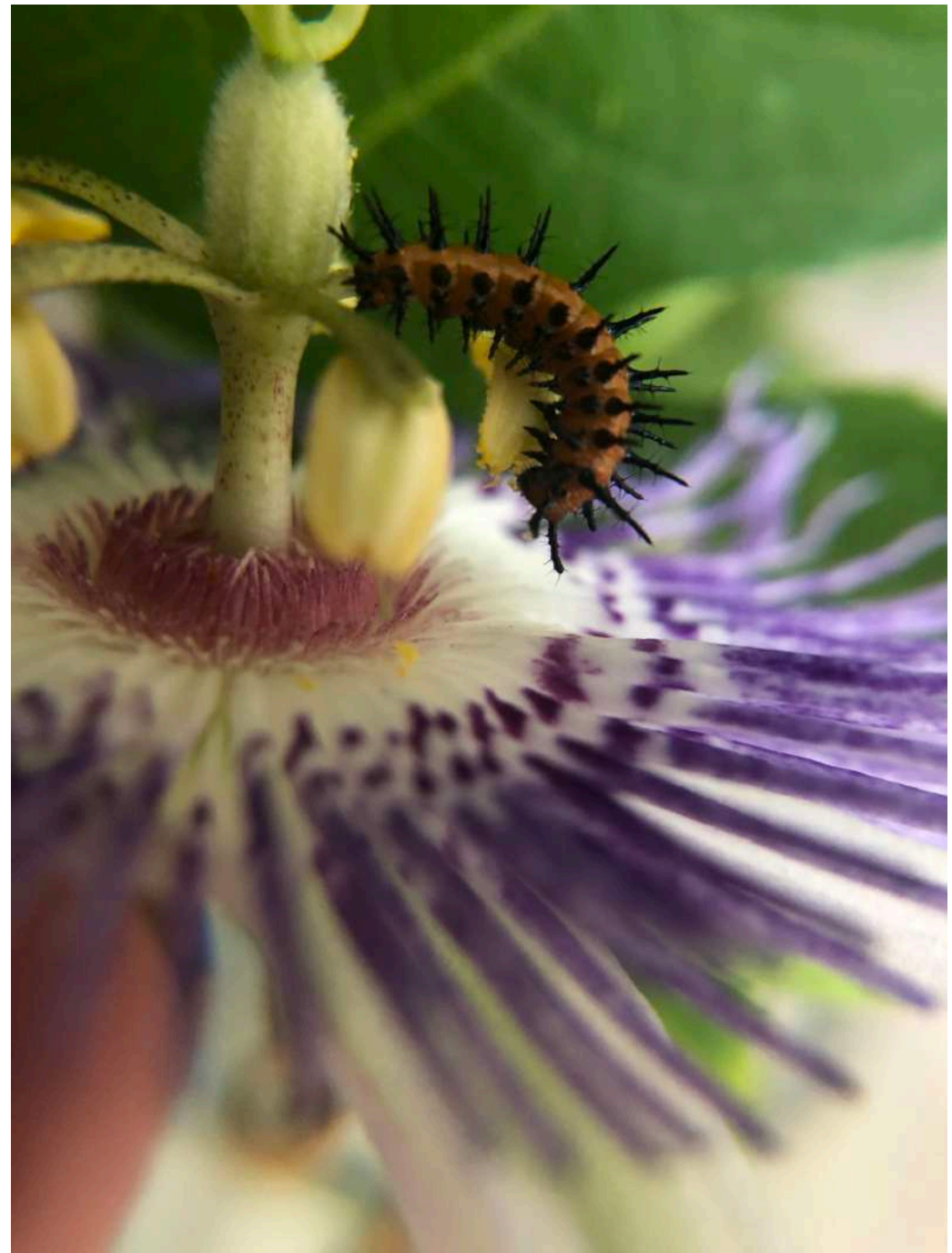
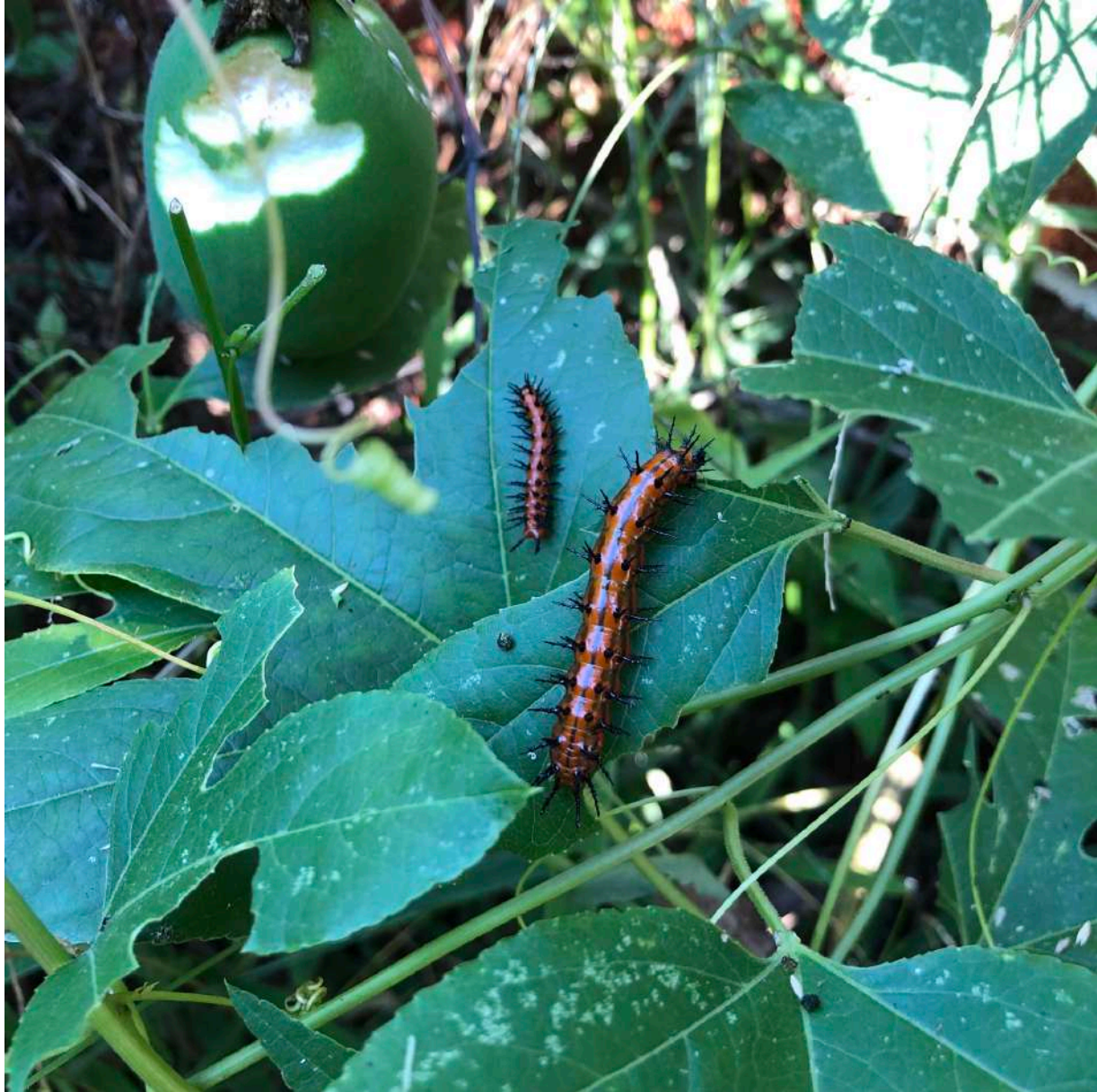
Very hungry...you know



700 species of *Passiflora*
Passiflora incarnata only native in TN



Cost to Plant



Plant Defenses – mutualism



Boom year for Gulf Fritillary – Boom year for Predators

Shield Assassin Bug



Parasitoid – wasps or flies

Metamorphosis

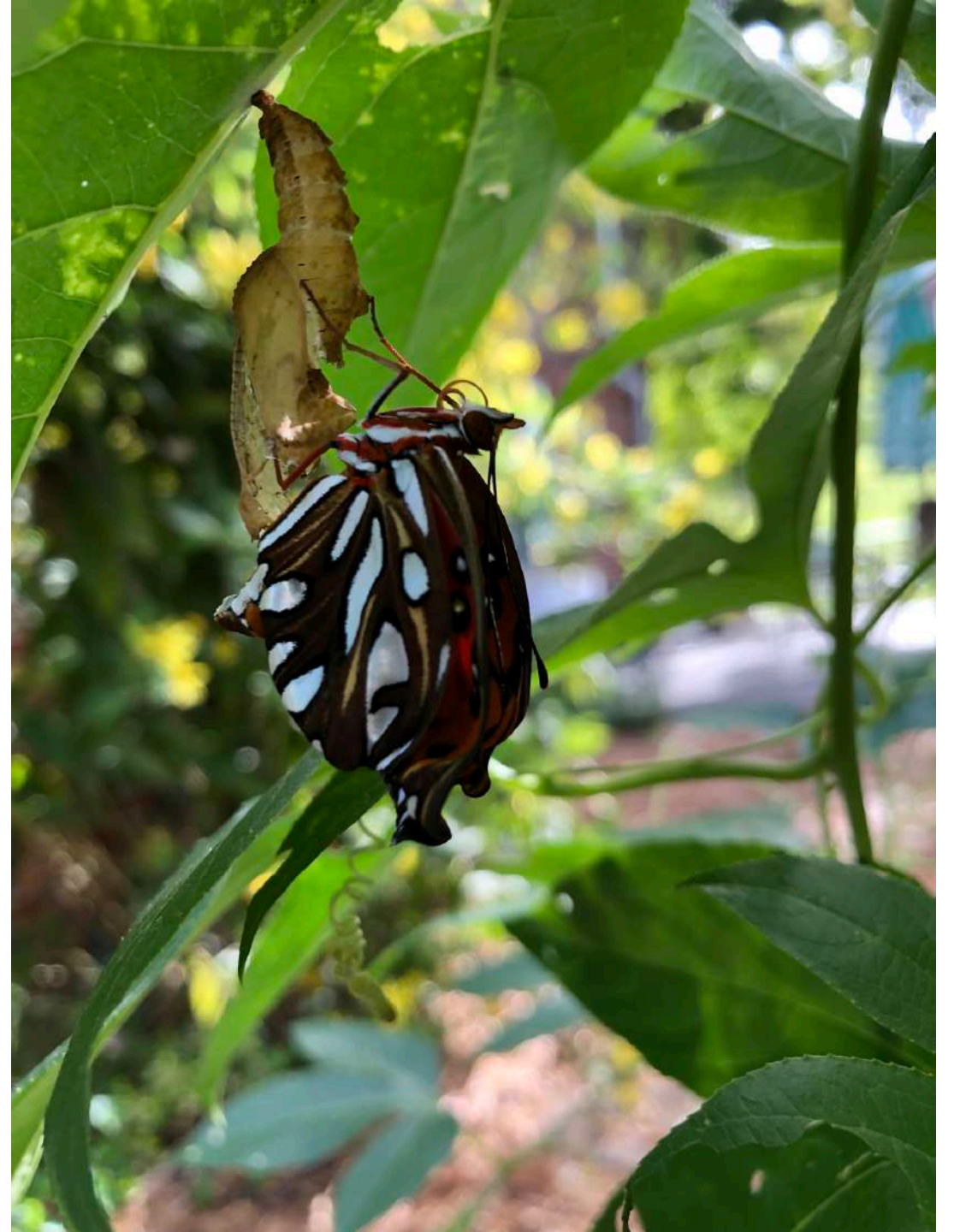


Caterpillar



Pupae/Chrysalis

Metamorphosis



Act 1 - Caterpillar & Host

Act 2 – Diversity drives Diversity

Bees & Butterflies

Honeybee



Carpenter Bee



Zebra Swallowtail

Monarch



Bees & Butterflies



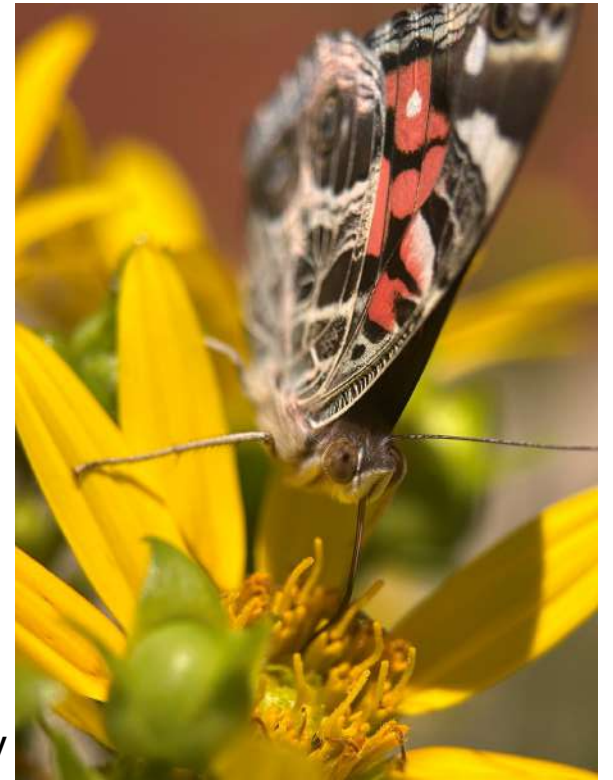
Giant Swallowtail



Tiger Swallowtail



Checkerspots



Painted Lady

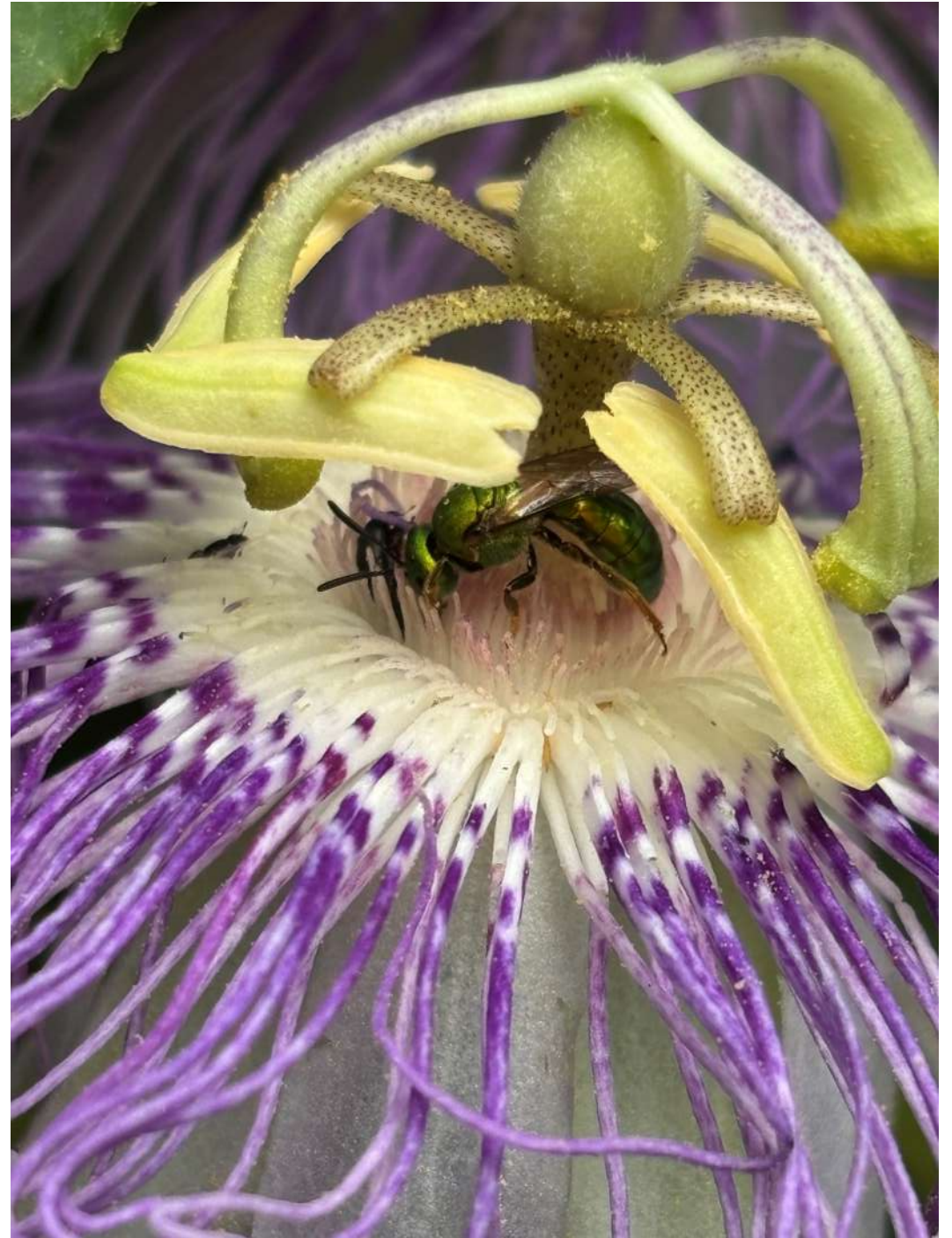
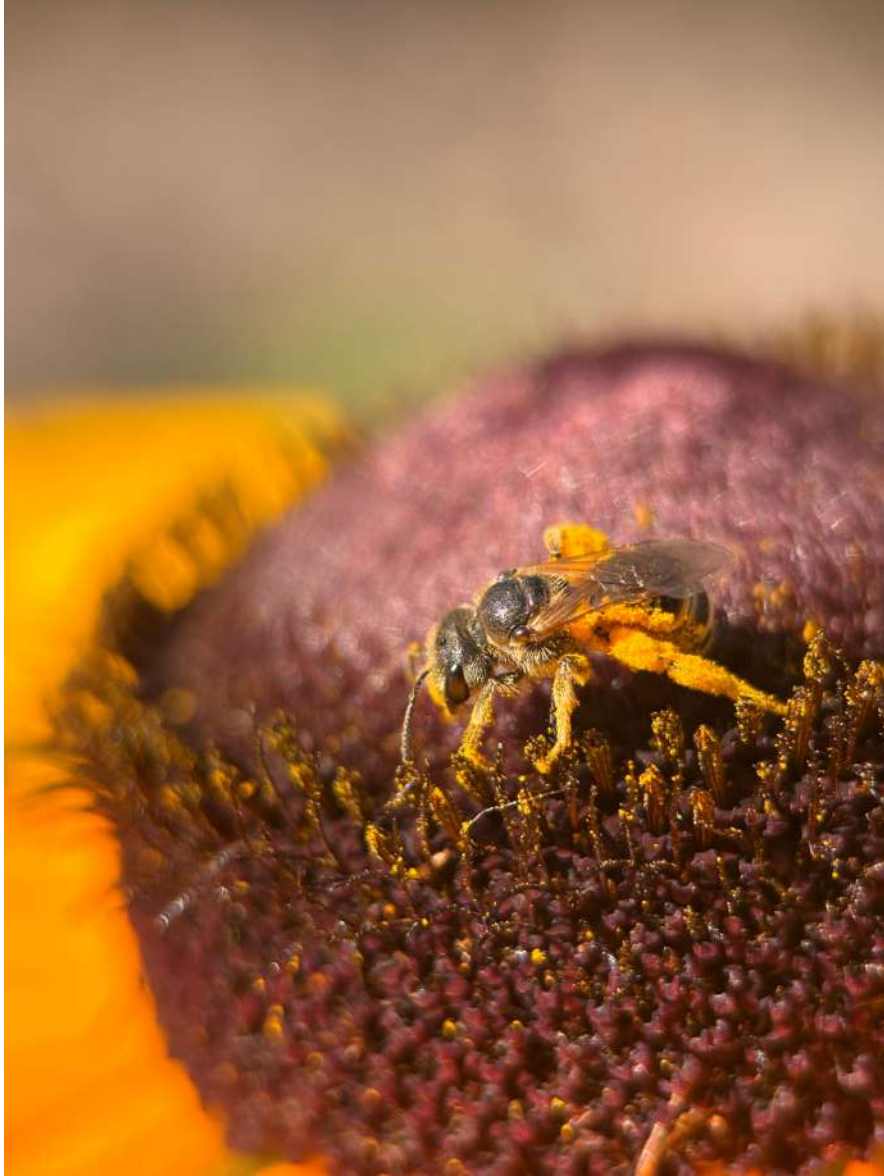
Feeding - To Bee or not to Bee



Feeding - To Bee or not to Bee



Nectar and Pollen



More than Bees & Butterflies



Elephant Mosquito

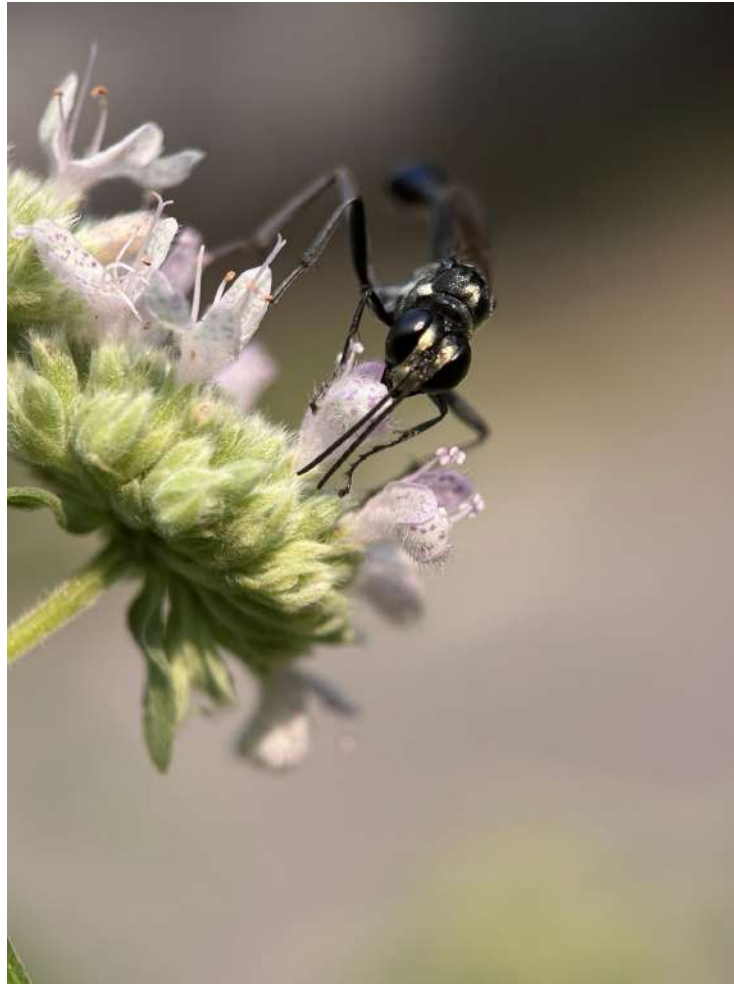
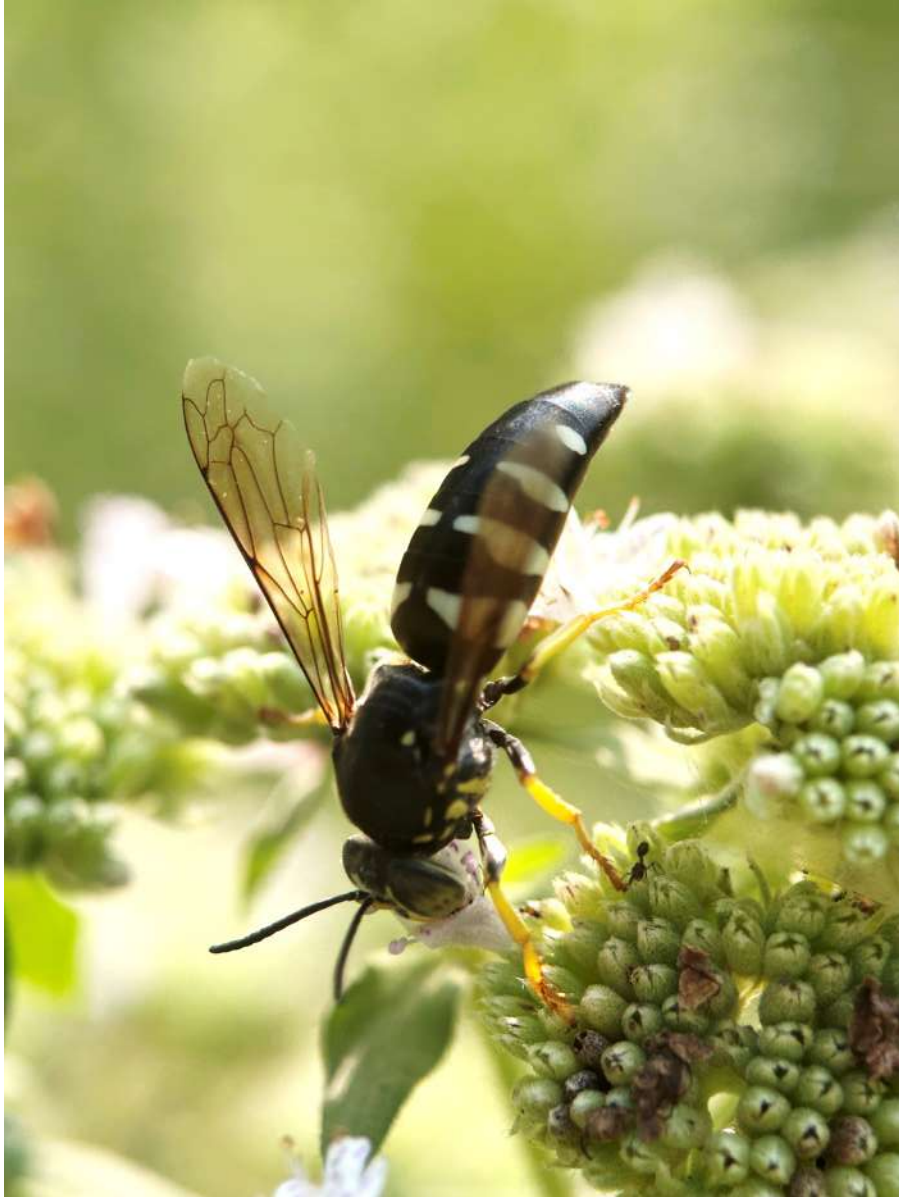
Great Golden Digger Wasp

The Beauty of Wasps

Elegant Tarantula Hawk



Four-Banded Stinkbug Wasp



Gold-Marked Thread Waisted Wasp



Golden-Reined Digger Wasp (Male)

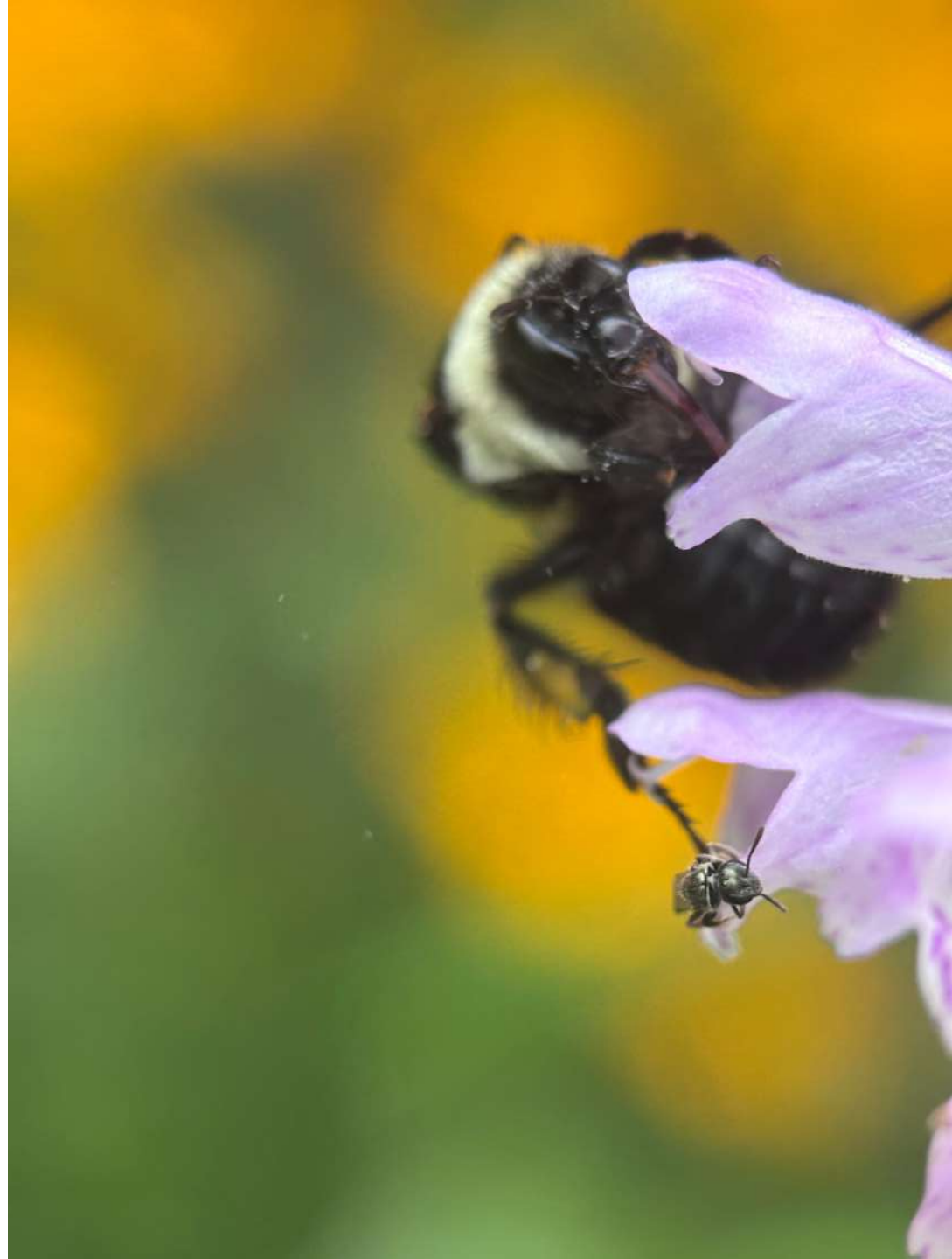


Fraternal Potter Wasp



Native Bees

Bombus sp.



Carpenter Bee
Sweat Bee

Native Bees

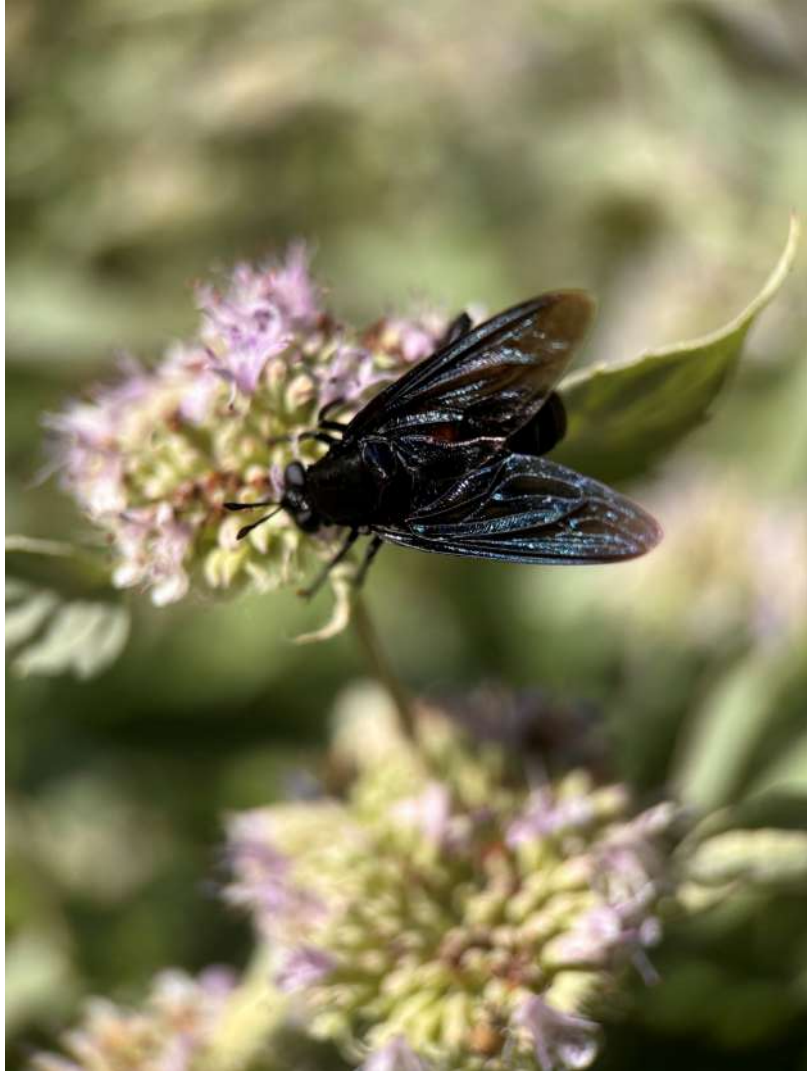


Bombus sp + *Clematis* sp.

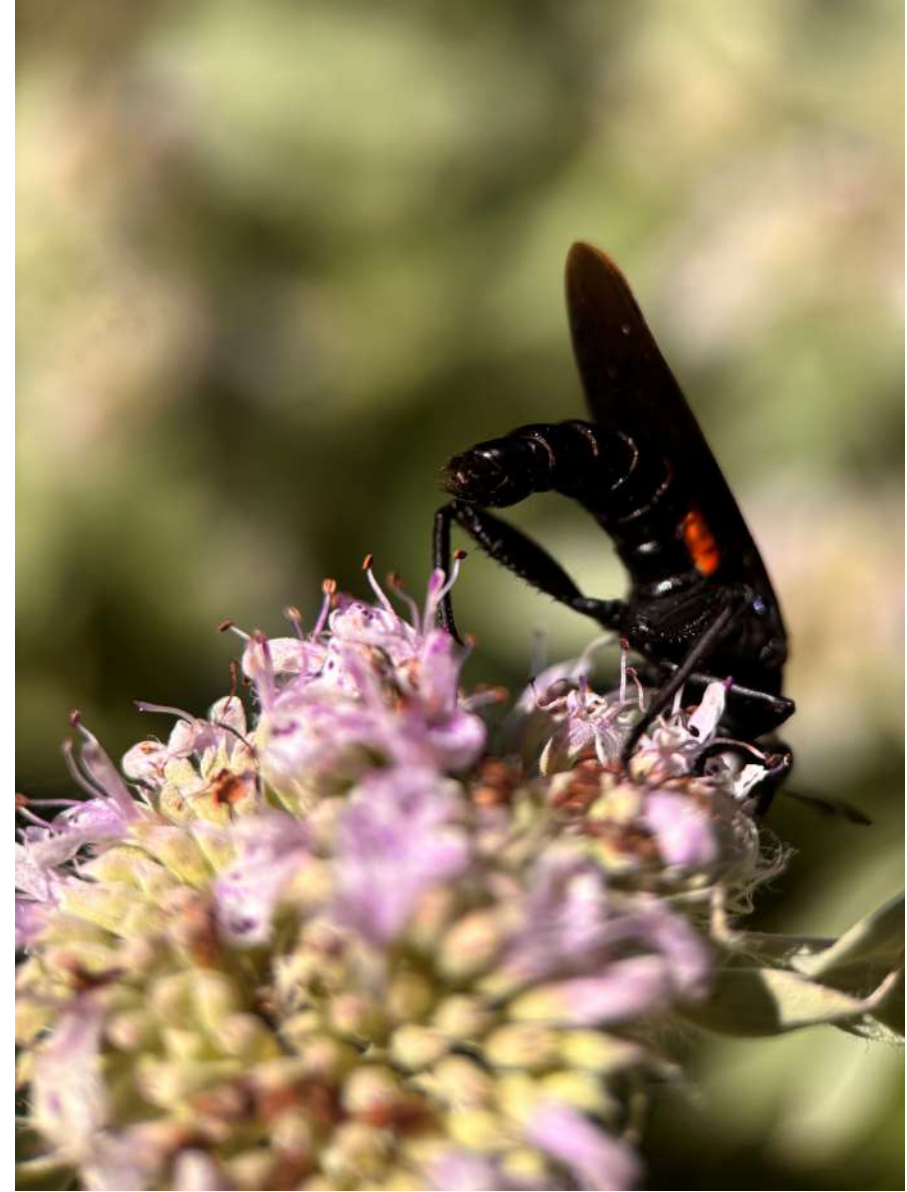
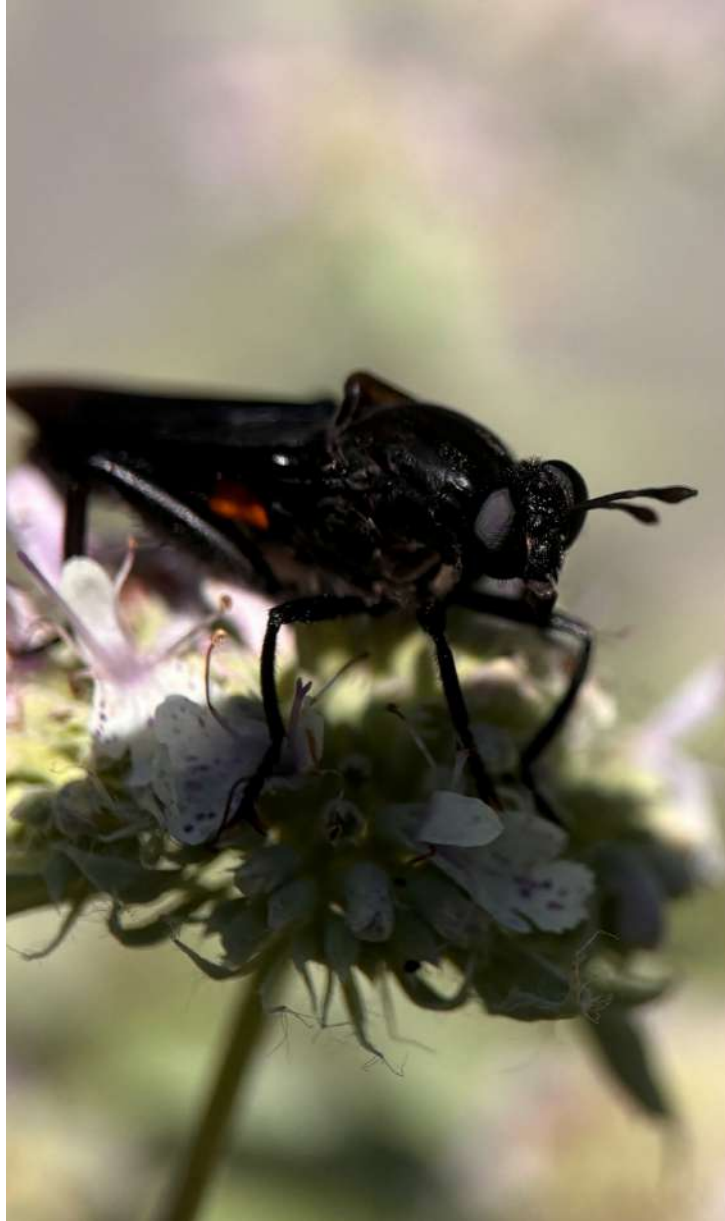


Bombus sp.

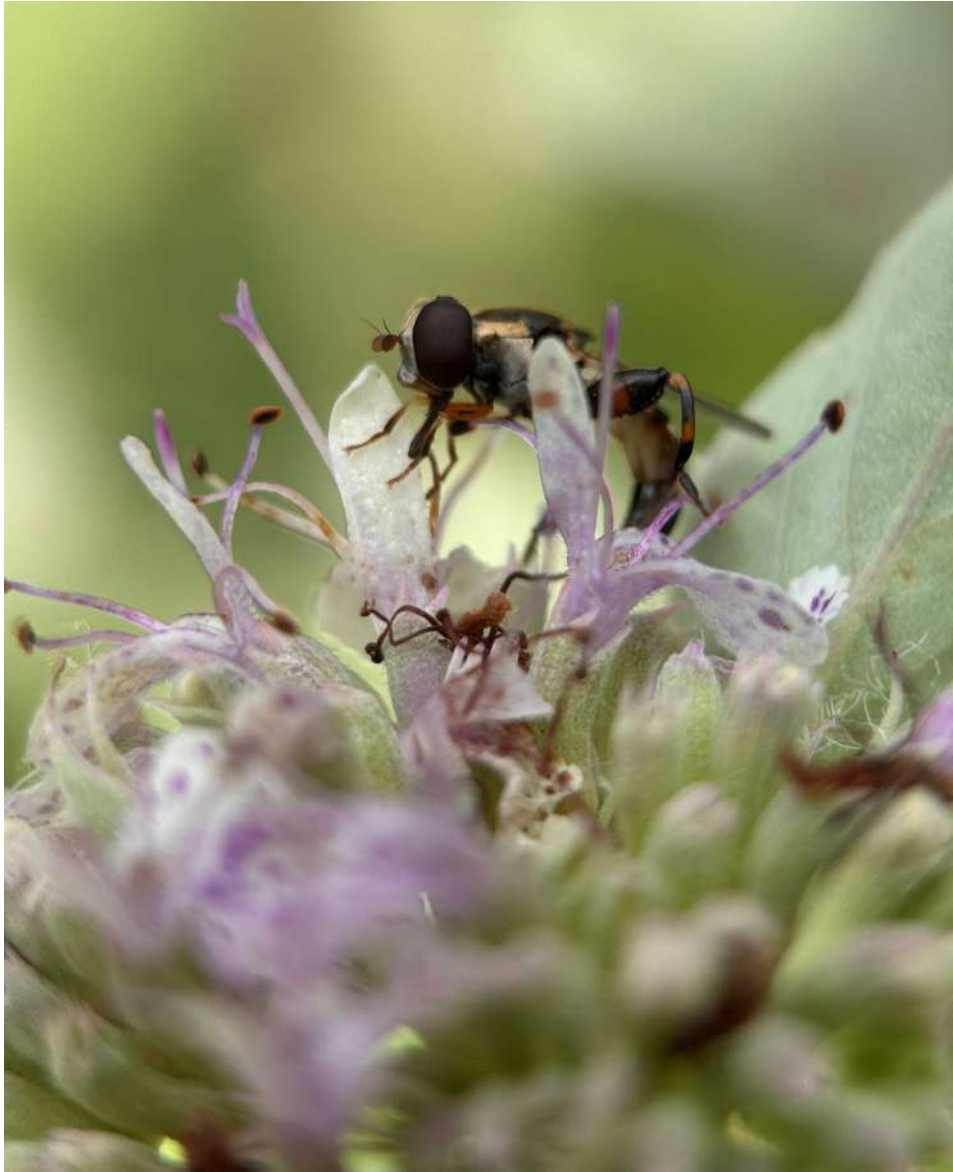
Flies and Allies



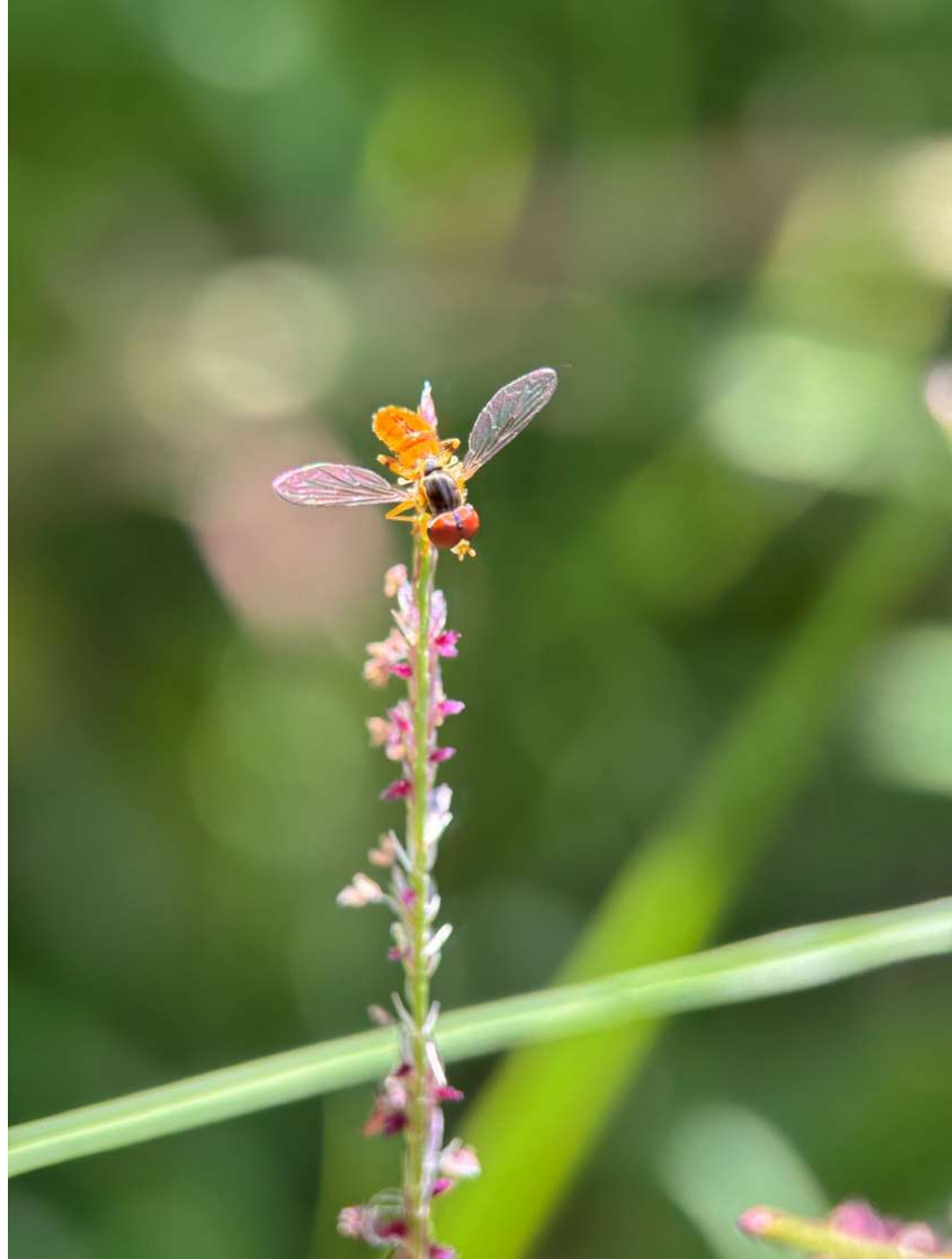
Clubbed Mydas Fly



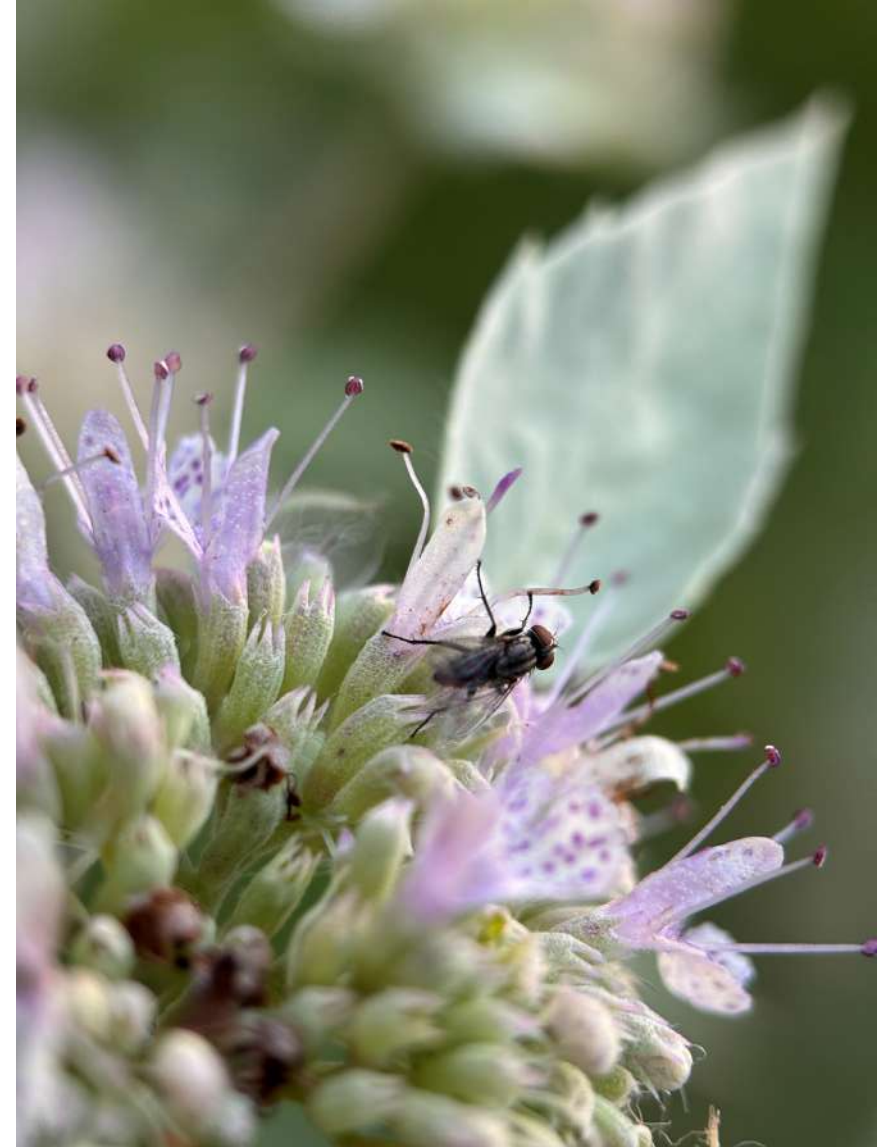
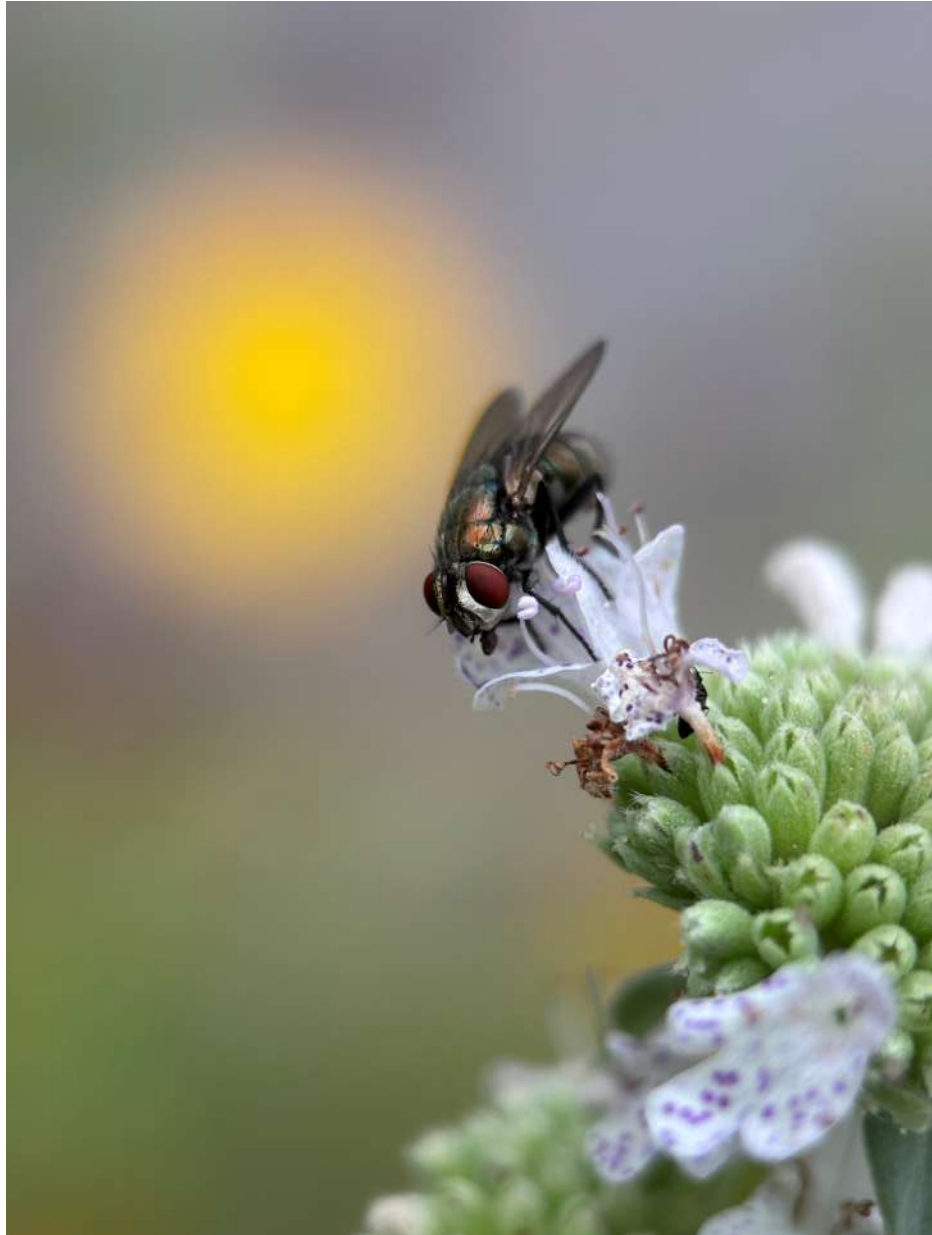
Flies and Allies



Hoverflies



Flies and Allies



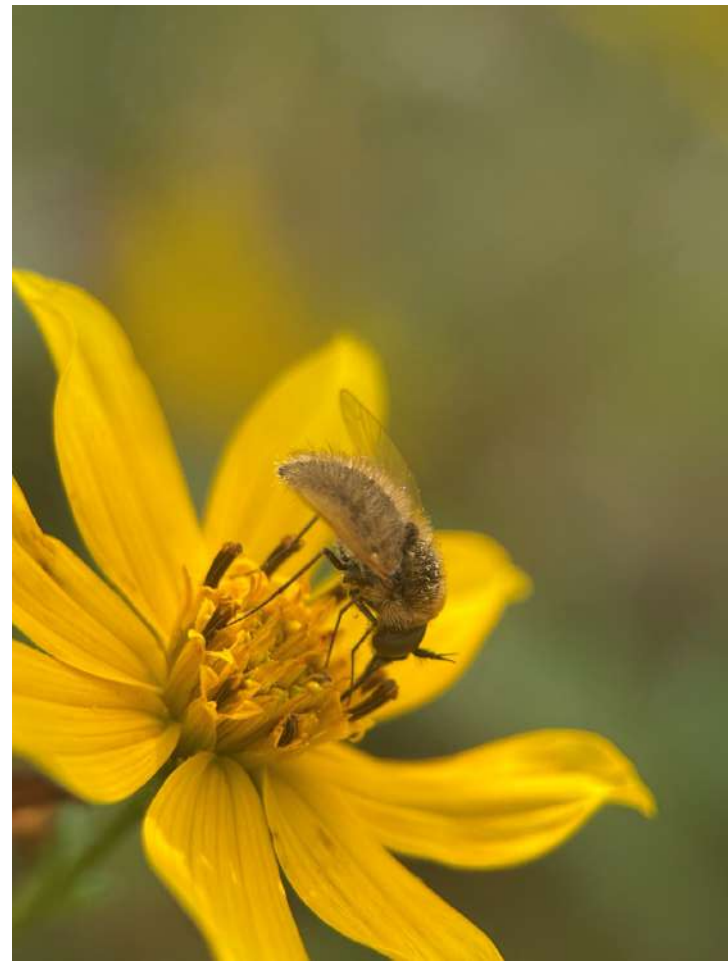
Flies and Allies



Aedes albopictus



Bee Fly



Other... activity



Gold-Marked Thread Waisted Wasp



Sarcophaga sp.

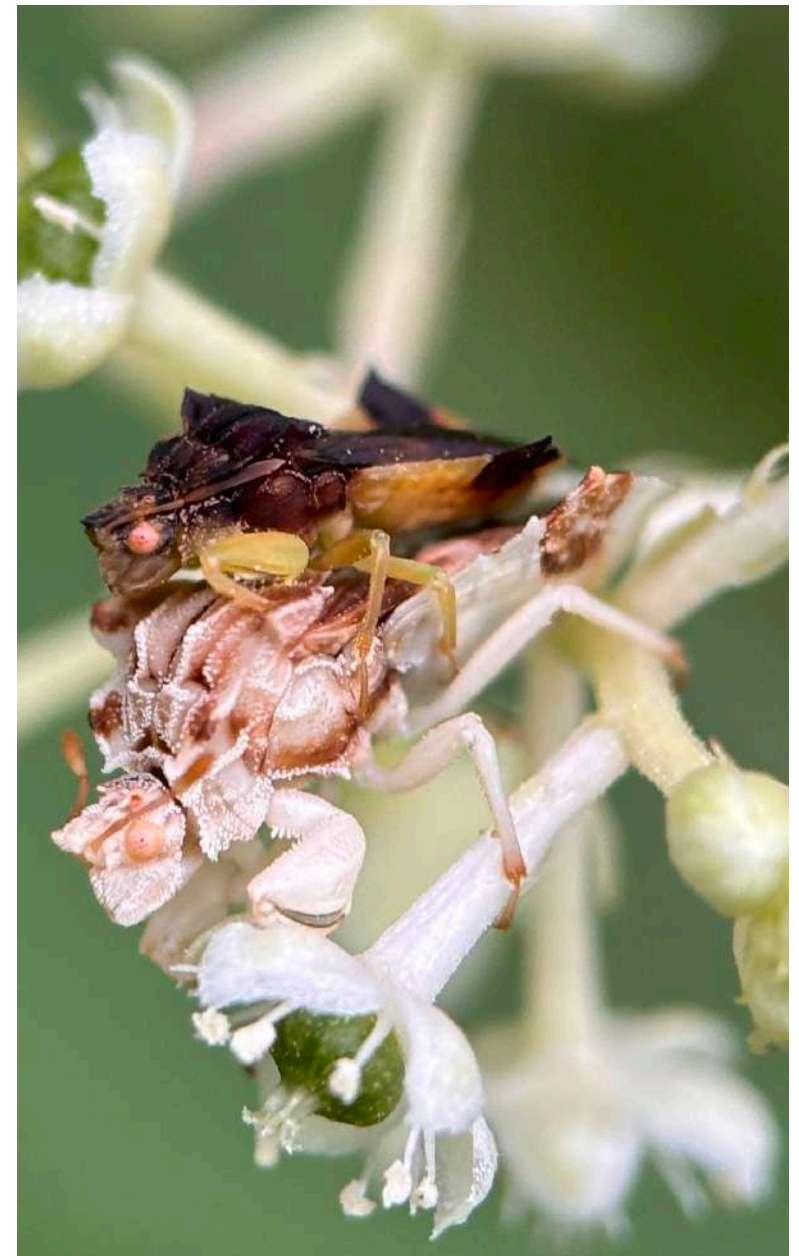
Other... activity



Dogbane beetles and...Dogbane



Milkweed Beetles & Milkweed



Jagged Ambush Bugs & Poke Flower

Act 1 - Caterpillar & Host

Act 2 – Diversity drives Diversity

Act 3 – Predation and Food Web

Camouflage



Jagged Ambush Bugs, *Phymata*



Camouflage



Jagged Ambush Bugs, *Phymata*



Camouflage



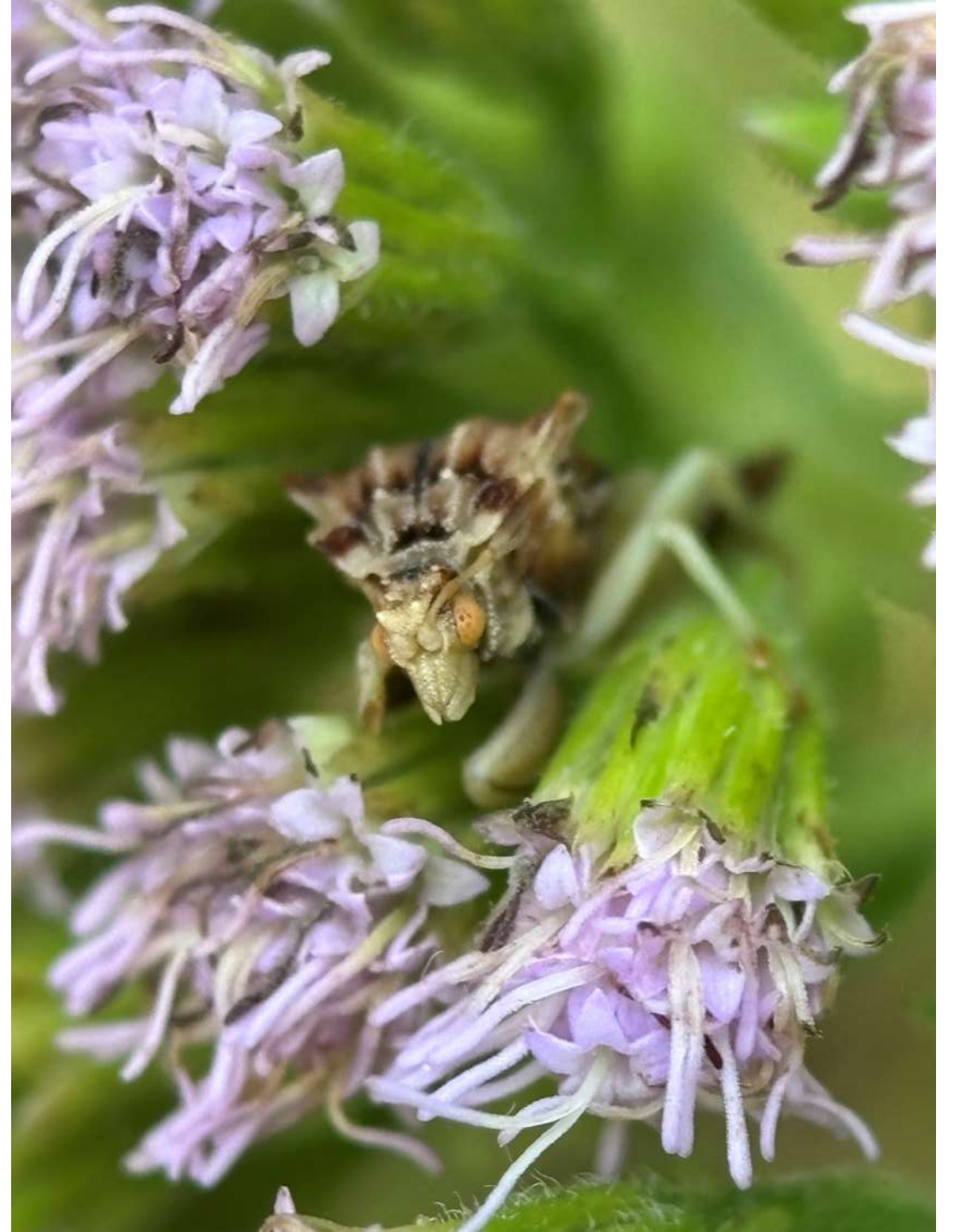
Jagged Ambush Bugs, *Phymata*



Camouflage



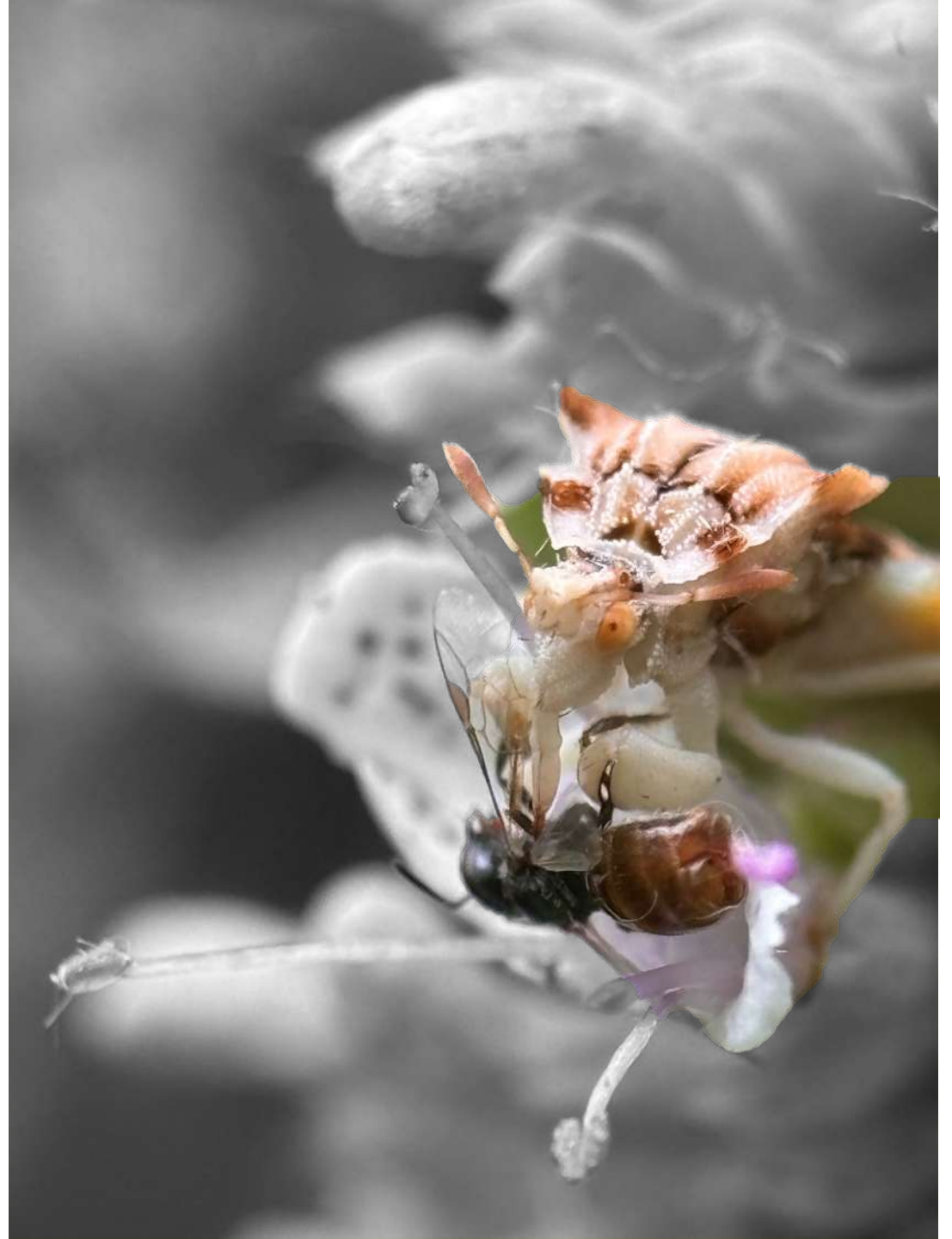
Jagged Ambush Bugs, *Phymata*



Camouflage



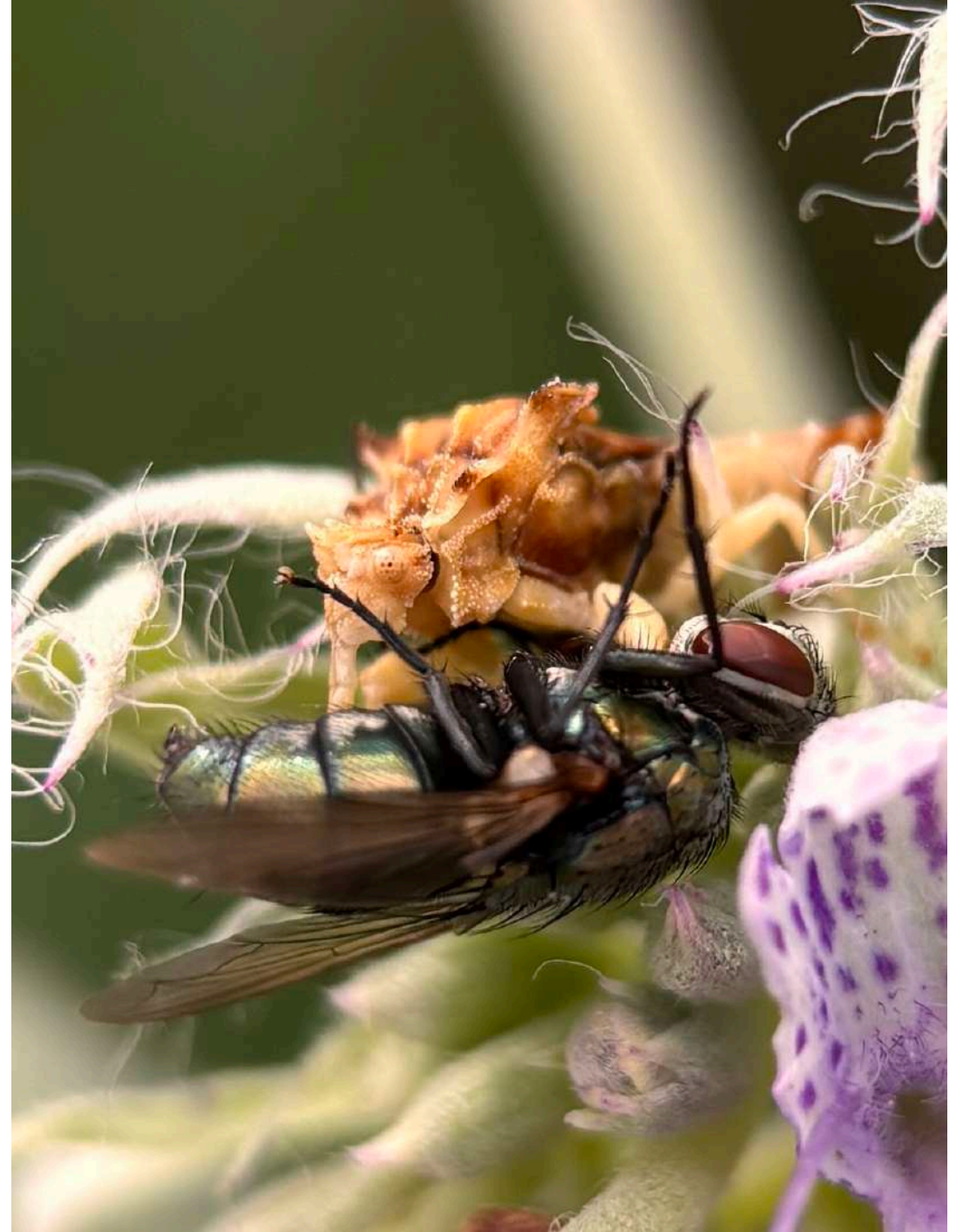
Jagged Ambush Bugs, *Phymata*



Large Prey



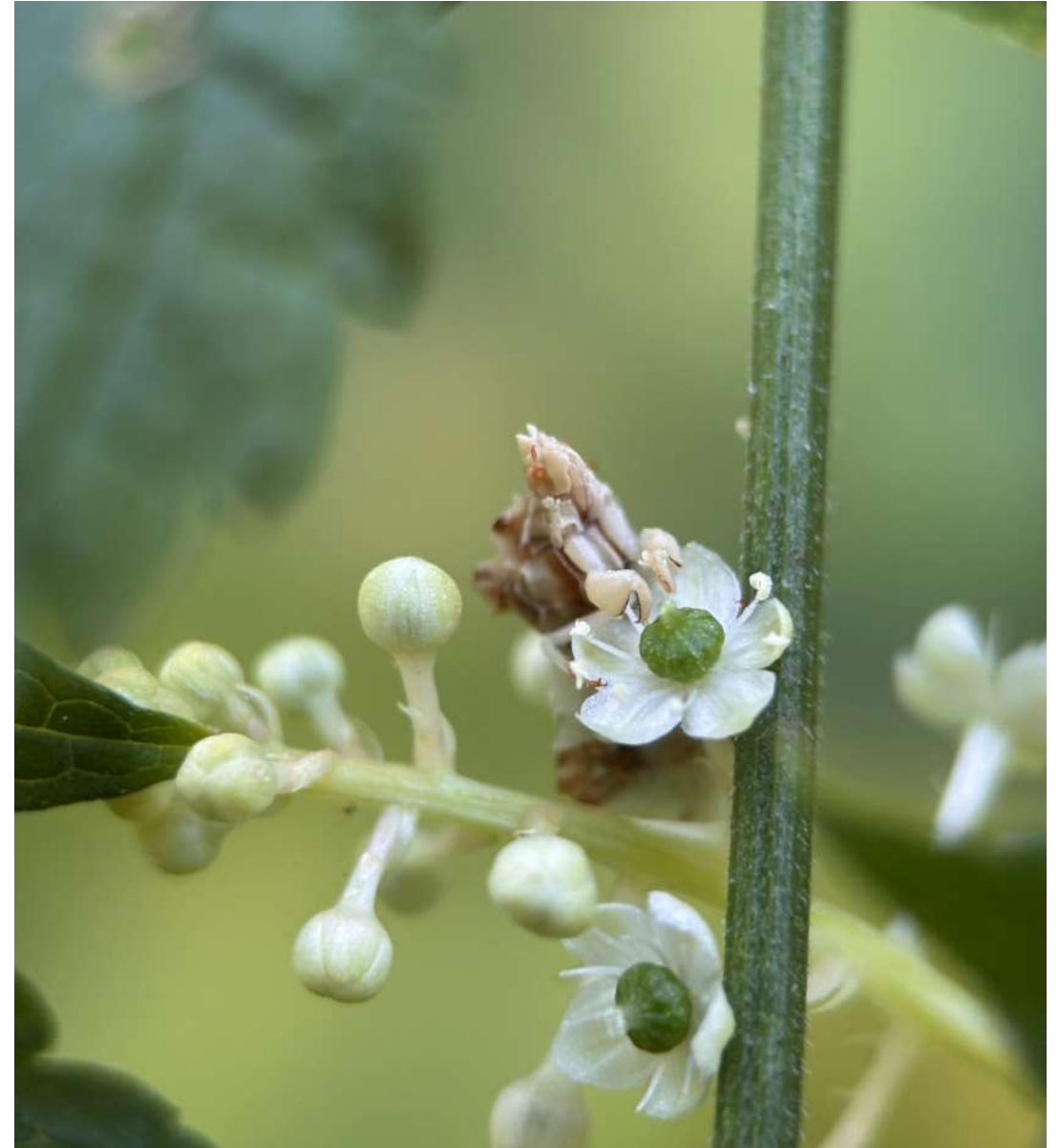
Jagged Ambush Bugs, *Phymata*



Camouflage – Ambush Predator



Phymata sp. & Dogbane

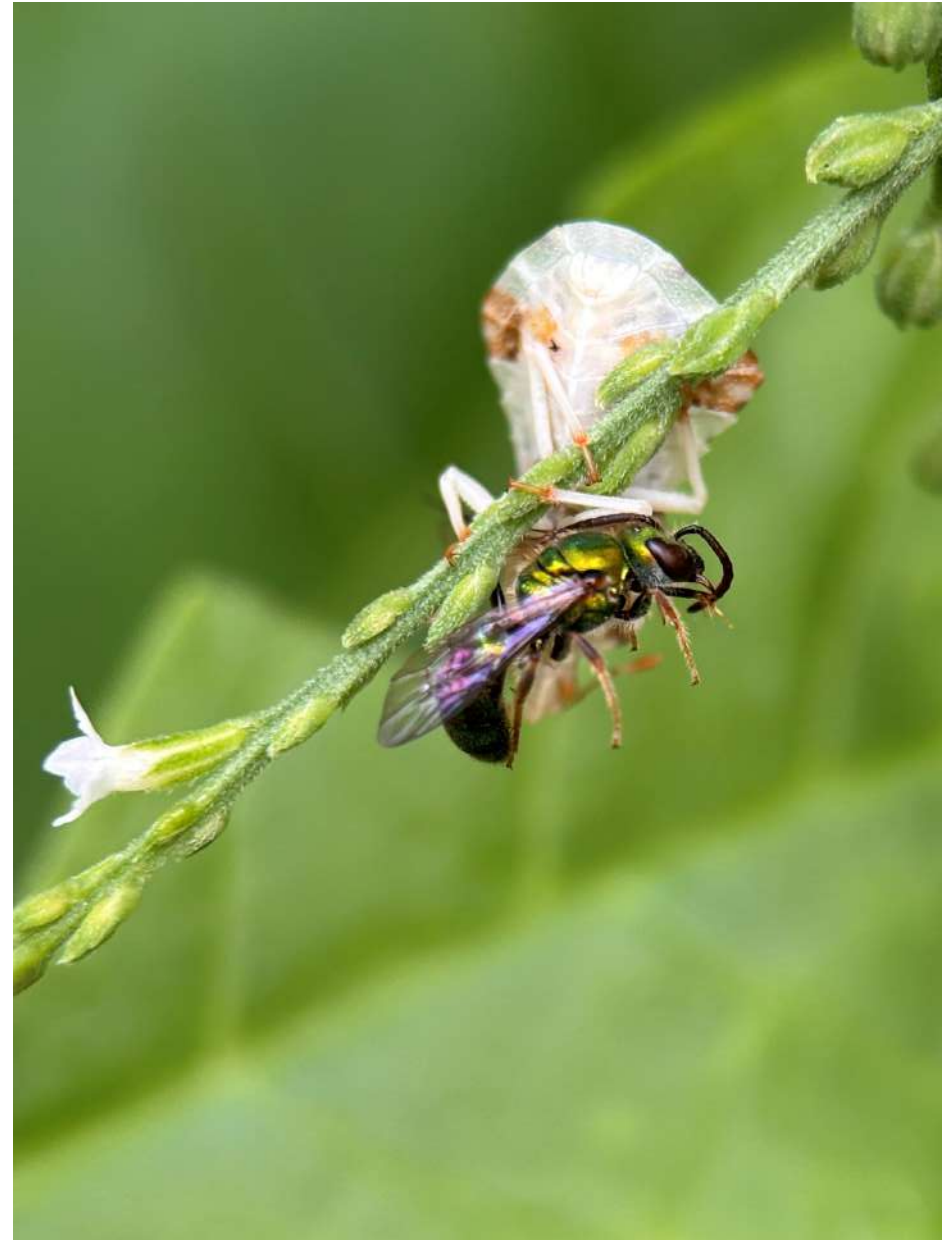


Phymata sp. & Pokeweed

Camouflage – Ambush Predator



Phymata & Verbena urticifolia



Camouflage – Ambush Predator



Lynx spiders



Crab Spiders – Masters of Camo...

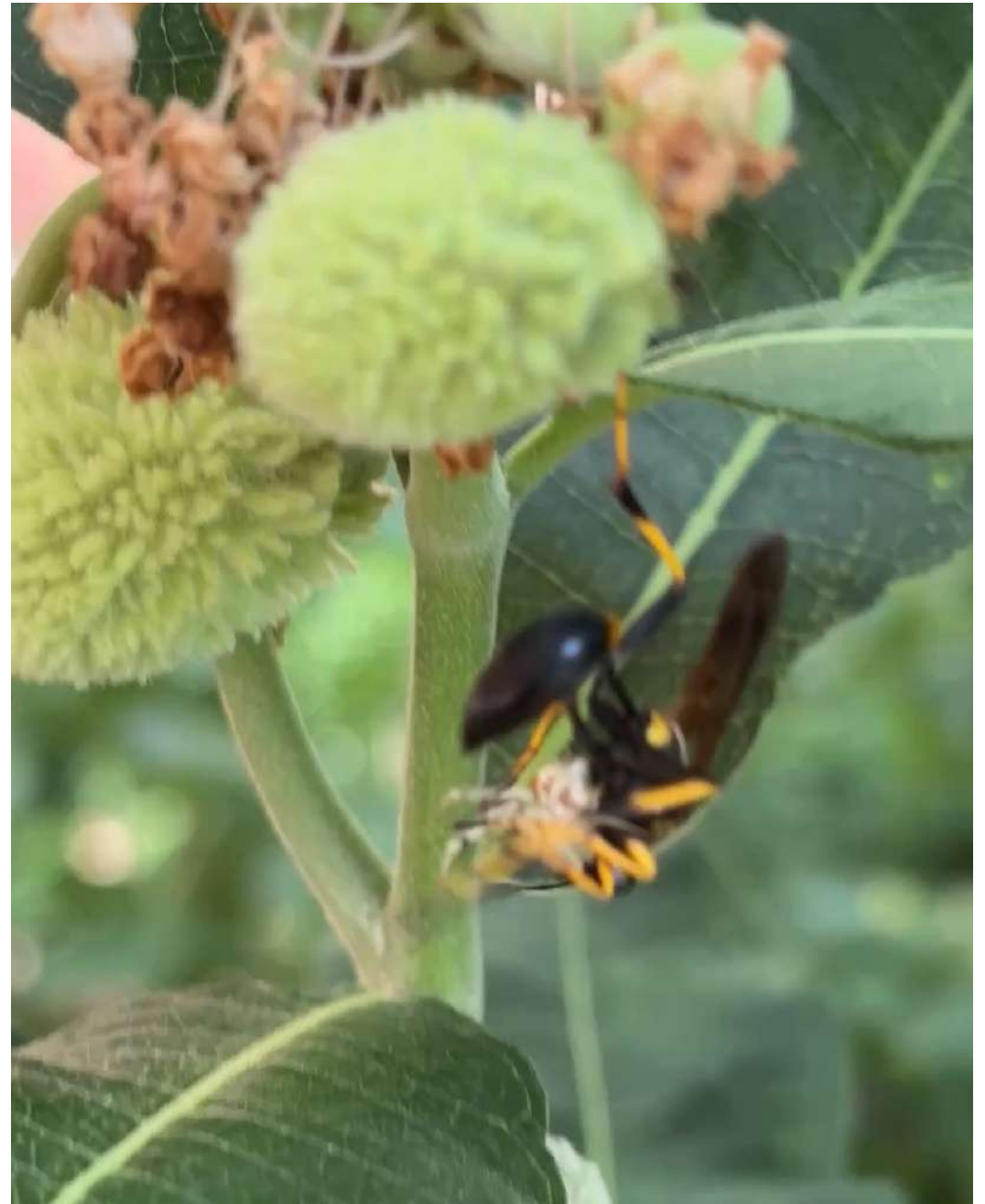


Crab spider – masters of camo

Predators are prey too



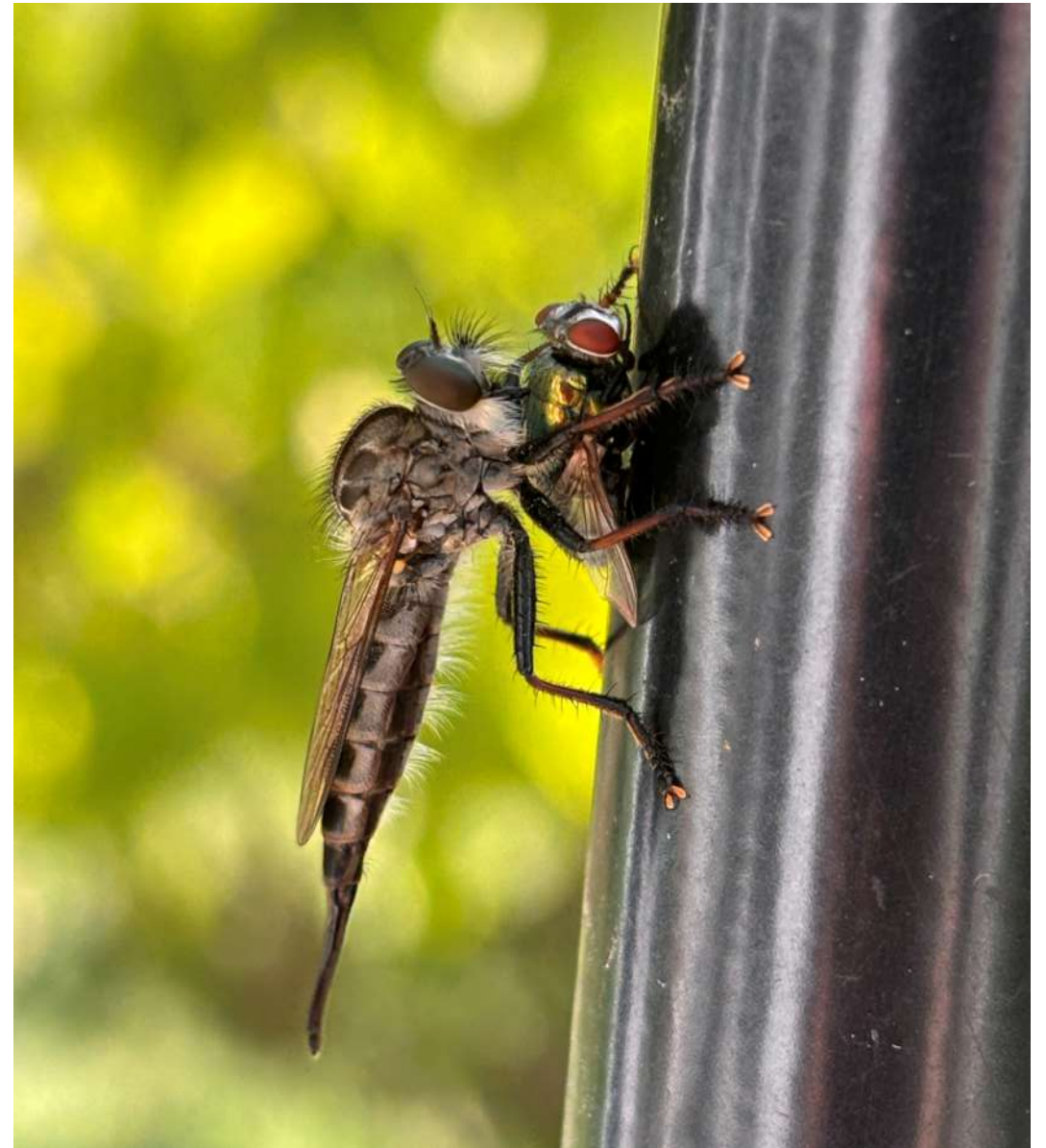
Yellow-legged Mud Dauber & Crab Spider



Ambush vs Active



Assassin Bug nymph & tiny prey



Robber Fly & fly prey

Active Predators



Robber Fly & Carpenter Bee



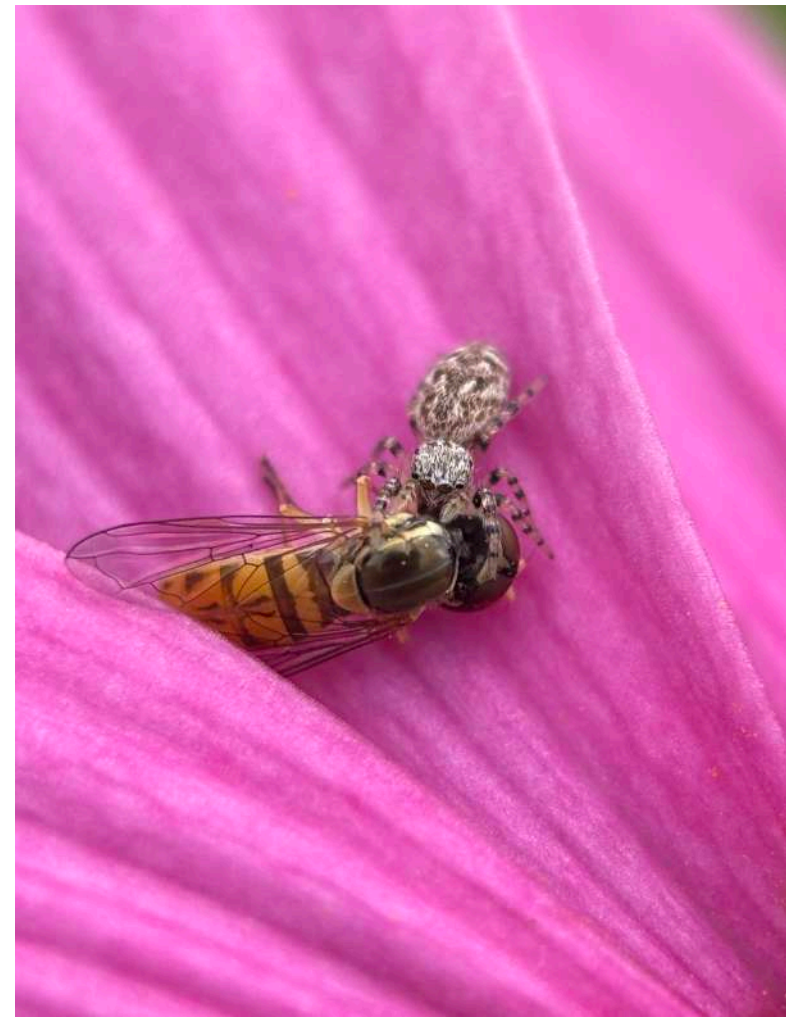
Long legged fly



Blue Dasher

Cutest little predators – Jumping Spiders

Emerald Jumping Spider



Female Jumper & Hoverfly



Female Jumper & fly

Cutest little predators – Jumping Spiders



Emerald Jumping Spider



Bold Jumping Spider

Act 3 – Tiny little predators



Lacewing species

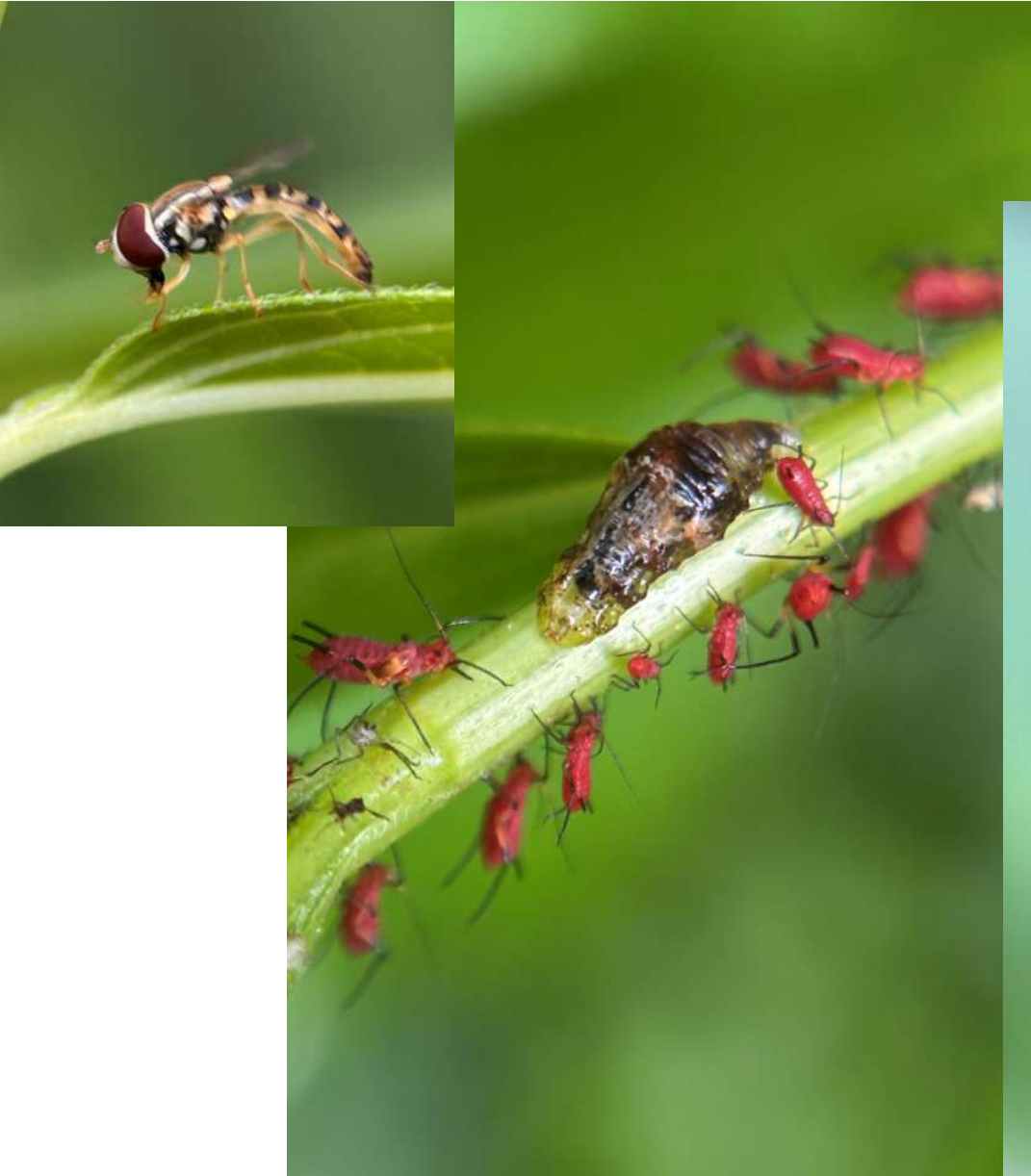


Wasp and Brown Marmorated Stinkbug Eggs



Food Web

Hoverfly: Pollinator, Predator, Prey



Chipping Sparrow & Caterpillar

Like a safari in your back yard



Carolina Mantis



Spined Assassin Bug



Broad-headed Sharp Shooter

Complex system



Firefly



Fowlers Toad



House Wren & Centipede

Complex system



Cedar Waxwing & cedar



Ringneck Snake



Eastern Box Turtle



Snowberry Clearwing

Doesn't have to be large



Find your Hero plants



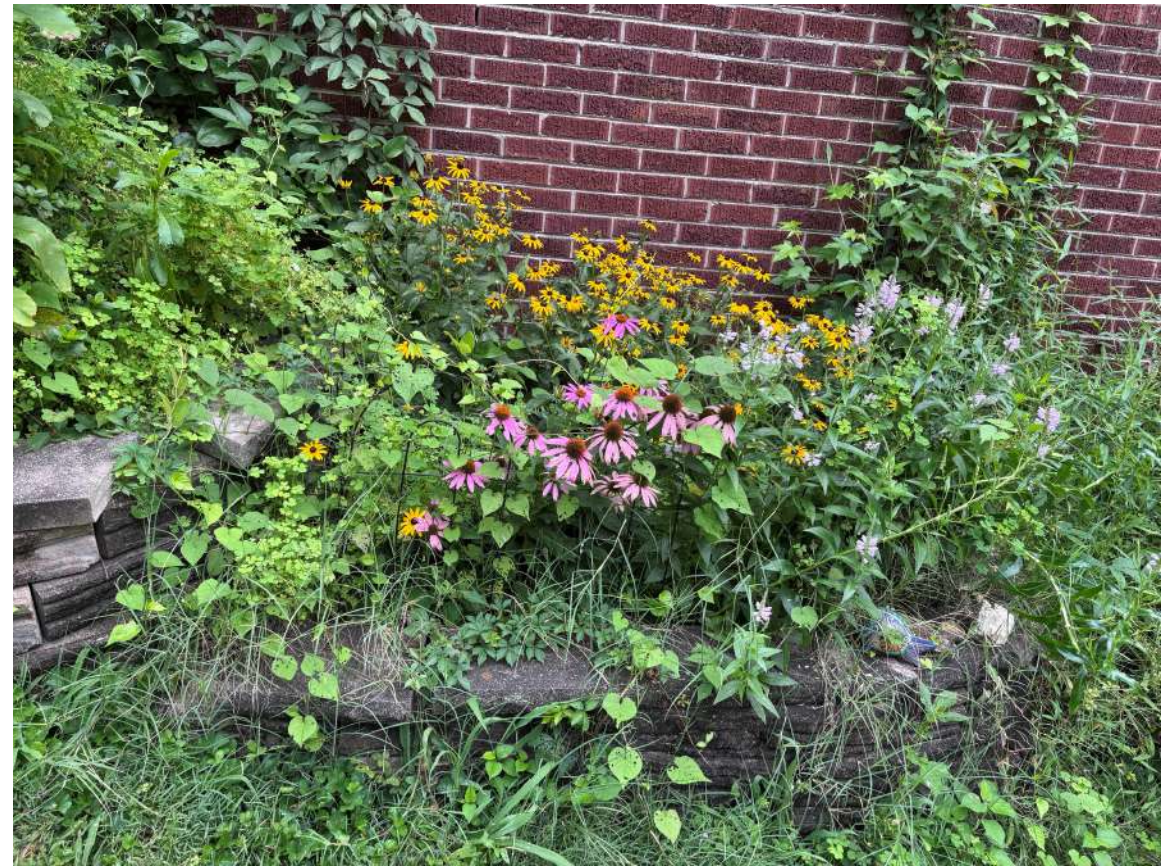
Host plants

Generalist plants



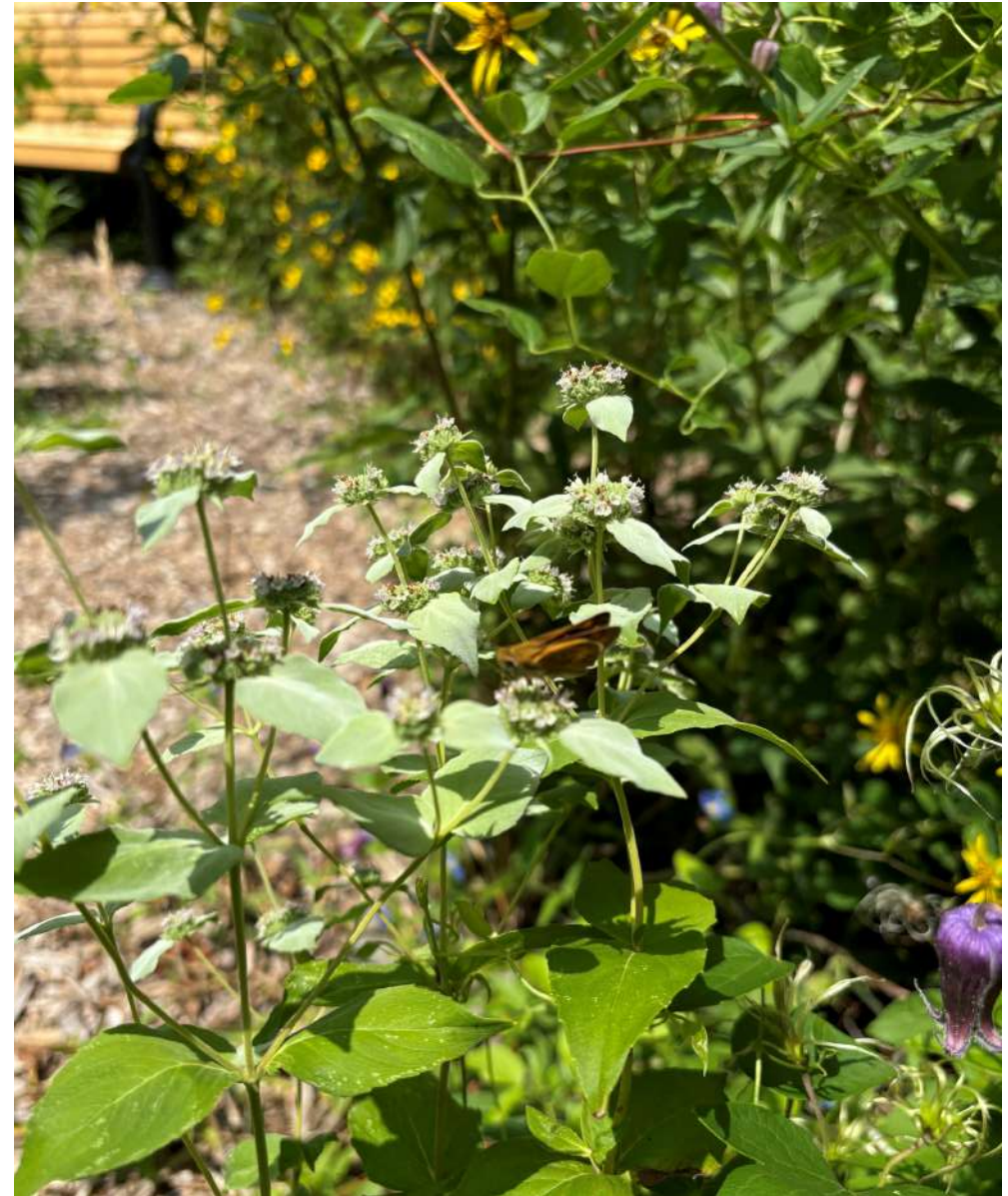
Find your Hero plants

Diversity



Find your local gardens & trails

APSU Wildflower Gardens



Keep Your Eyes Open

- Notice the small things
- Remember, if your plants are eaten...it's OK
- Complex Interactions
- Diversity yields diversity
- Other resources:
 - Healthy Yards (Clarksville, CEFB)
 - RePlant Clarksville
 - Bugguide.Net
 - iNaturalist
 - SGI



Acknowledgements

- Laura Hunt
- Michell Rogers
- Trenton Flower Patch
- Sweeter Days Farm
- APSU Native Flower Garden
 - Wes Powell, SGI
- Stefan, Townes & Sedge Woltmann



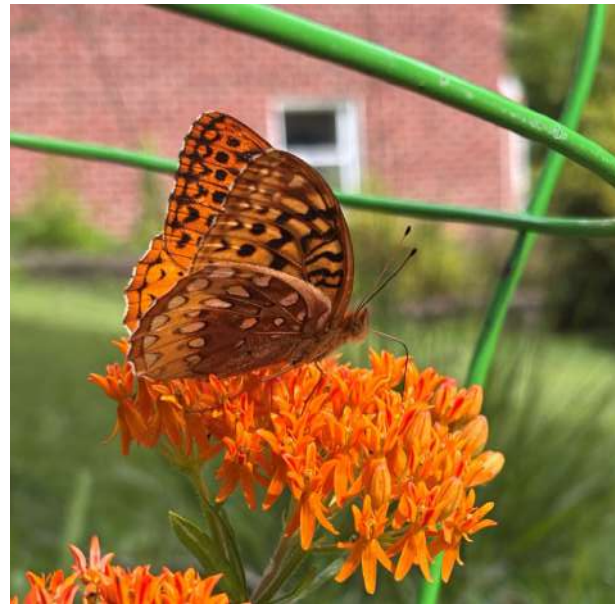
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Fritillary VS Long wing



Gulf Fritillary



Great Spangled Fritillary



Variegated Fritillary

