

An aerial photograph of a coastal landscape. A wide river flows through a green, marshy area on the left. To the right, a dense forest of tall trees covers a peninsula. The forest meets a sandy beach that curves along the coastline. The ocean is visible in the distance under a blue sky with scattered clouds.

*Botanical Adventures in Georgia's
Coastal Counties*

In six counties, 180 plant families with ~1800 plant species

More than 35% of Georgia's flora

Photos (mostly) by Hugh & Carol Nourse, James Holland, Richard & Teresa Ware,
Bobby Hattaway, Eleanor Dietrich, Alan Cressler, Will Cook, and Dan Tenaglia

THANK YOU!



Sandhills: ancient sand dunes with deep, excessively drained sandy soils and fire-maintained vegetation



Floodplains and freshwater tidal swamps

An aerial photograph of Blackbeard Island, showing a dense forest of dunes, salt marshes, and a winding waterway. The island is a long, narrow strip of land with a thick forest of green trees. To the left, a winding waterway flows through a marshy area. To the right, a wide, sandy beach meets the ocean. The sky is blue with scattered white clouds.

Barrier Island Dunes and Salt Marshes

Blackbeard Island

The Big Four Coastal Flowering Plant Families



Composite family - Asteraceae:
the largest plant family in the world



What makes a Composite a composite?

Many flowers are grouped into heads, typically with:

- a central disk with many tiny flowers,
- surrounded by a whorl of showy ray flowers,
- supported by whorls of green bracts.



“in- voe-loo-ker”

involucre – composed of involucre bracts, also called phyllaries

It's Botany.... of course, there are exceptions!

Sometimes either the ray flowers *or* the disk flowers are missing



Typically,
both ray and disk
flowers are present.



Disk flowers present.
Ray flowers missing.



Ray flowers present.
Disk flowers missing.

Why is the composite family so successful?

More than 23,000 species, found on every continent except Antarctica.

Very efficient pollination strategy:

Many flowers (100s!)

packed into a small head

means that a pollinator can

visit many flowers in a short

time with the least amount

of energy expenditure.

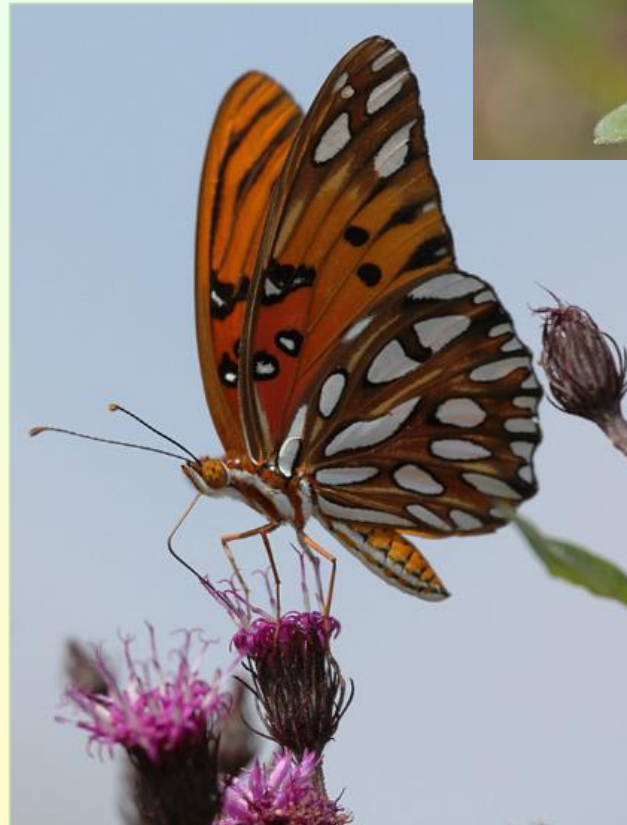
Lots of cross-pollination =

many fertile seeds =

reproductive success.



Phaon Crescent on Black-eyed Susan



Gulf Fritillary on Ironweed

Coastal Honeycomb-head

Balduina angustifolia

Sand dunes and sandhills

Stems up to 3 feet tall, reddish.

Leaves very narrow, needle-like.

Flower heads with 8 ray flowers and
a central dome of yellow disk flowers

After flowers and seeds fall off, the
Honeycombed receptacle is revealed.



Similar to Yellow Honeycomb-head
found in wet flatwoods. It has only one
flower head per stem. (*B. uniflora*)

Blanket-flower, Fire-wheel

Gaillardia pulchella

Sand dunes and dry disturbed areas

Disk flowers maroon, ray flowers bi-colored.



Pollinated by bees and butterflies

Seaside Ox-eye Daisy

Borrichia frutescens

Edges of salt marshes

Stems 1 – 5 feet tall, succulent, covered in dense gray hairs, as are the leaves.

Leaves succulent, spoon-shaped with raised veins.

Flower heads solitary at tip of 2 - inch stalks.



After flowers and seeds are shed, the spiny receptacle is revealed. It turns brown and persists for months.

Dune Camphorweed

Heterotheca subaxillaris

Sand dunes, sand-flats, coastal roadsides

Bushy, sprawling stems are covered with long white hairs and stalked glands that release strong camphor-smelling compounds.



Leaves are thick, lance-shaped, hairy, and covered with glands.

As many as 40 volatile compounds have been identified in its tissues: this plant is serious about defense!

Saltmarsh Fleabane

Pluchea odorata

Salt marshes

Entire plant covered with glands. Widely used medicinally to reduce and heal inflammation.

Leaves have petioles (stalks).

Stinking Fleabane, *P. foetida*, has no petioles.
Camphor Fleabane, *P. camphorata*, has rounded flower cluster.



Flower cluster more or less flat-topped.



Groundsel Tree

Baccharis halimifolia

Edges of marshes and dunes,
disturbed areas



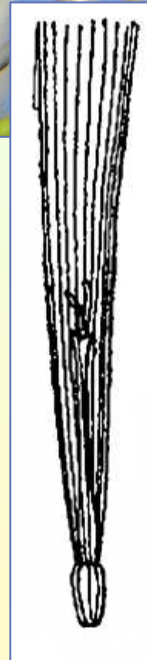
Dioecious shrub – female and male flowers are on separate plants.

Flowers are not showy
– no ray flowers –
and are wind-pollinated.



Female flowers equipped with pappus bristles (attached to top of fruit) for seed dispersal by wind.

fruit



Narrow-leaved Groundsel Tree

Baccharis angustifolia

Interdune swales, salt marsh edges

Shrub up to 13 feet tall.

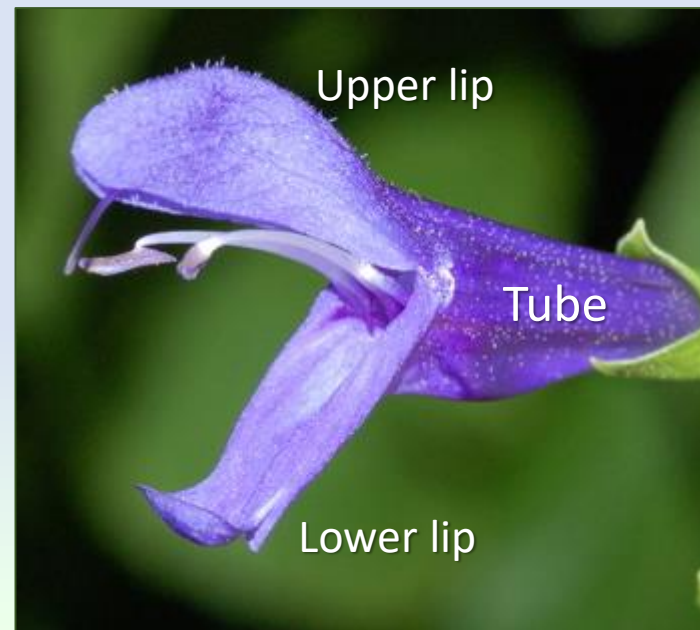
Leaves very narrow, succulent.



The Mint Family – Lamiaceae

What makes a mint a mint?

- Four-angled “square” stems
- Opposite leaves
- Aromatic or pungent leaves
- Flowers with a tube and two lips
- Four nutlets at the bottom of the flower tube



Mints are pollinator magnets and usually distasteful to deer.



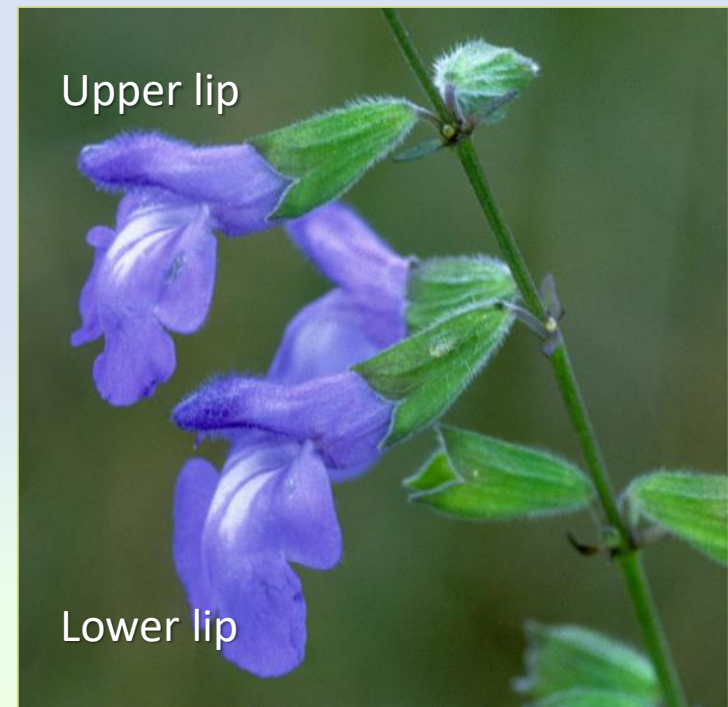
Blue Sage

Salvia azurea

Sandhills and other dry, open woodlands.

Upper lip very hairy, lower lip with two white stripes = landing strip for pollinators. AKA nectar guides....

Unmistakable, resembles no other GA wildflower.



Upper lip

Lower lip



Bi-colored form



White-flowered form

Coastal Plain Balm

Dicerandra linearifolia

Sandhills, scrub, & pine flatwoods

Upper lip with magenta streaks and spots.



Style and stamens long and showy, anthers orange with white "horns."

Leaves are needle-like and strongly minty.

Rose-balm, *D. odoratissima*, smells like cinnamon.

Spotted Bee-balm, Spotted Horse-mint

Monarda punctata

Dry woodlands, maritime forests

Flower clusters encircle the stem.

Flowers are yellow with purple or maroon spots.

Each flower cluster surrounded below by a whorl of pink bracts.



Blue Curls

Trichostema dichotomum (oval leaves)

Trichostema setaceum (narrower leaves)

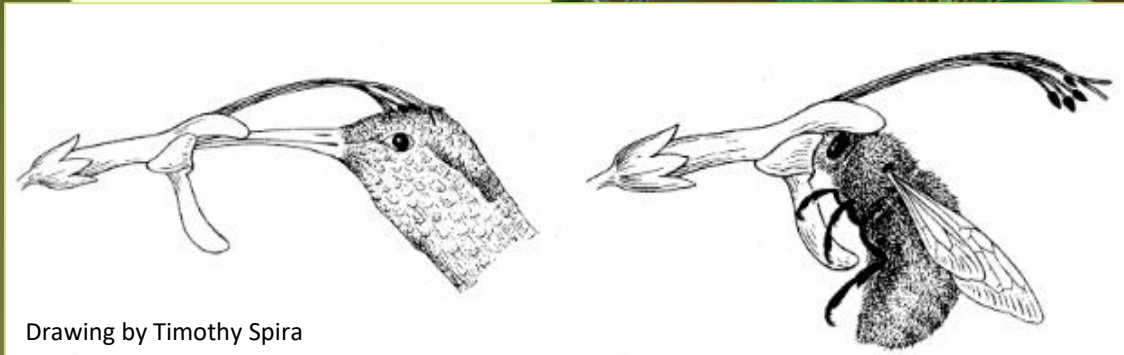
Dry woodlands and sandhills



Four showy blue stamens and the style arch up and away from flower.

Lower lip spotted with purple.

Pollinated by bees and hummingbirds.



Drawing by Timothy Spira

Tidal Marsh Obedient Plant

Physostegia leptophylla

Swamps and fresh or brackish tidal marshes



Both flower late May-early August
and have leaves that clasp the stem



Purple Obedient Plant

Physostegia purpurea

Wet pine savannas and flatwoods



Bean Family is hugely important in the Coastal Plain's Longleaf Pine communities

Represent more than 10% of the plants in these communities.

Forage for wildlife: their vegetation is high in nutrients and protein, making them an important forage source for deer, gopher tortoises, rabbits, and other herbivores.

Abundant seed producers: their high protein seeds are eaten by birds, small mammals, and lizards.

Fixes nitrogen: Bacteria in their roots convert atmospheric nitrogen to forms of nitrogen that are useable by plants and that are eventually returned to the soil.

Adapted to frequent fire: rapidly re-sprouts after a fire, returns nitrogen to soils after fire.

The Bean Family – Fabaceae

Three subfamilies, each with a different type of flower.....

Faboideae

Banner, keel, and wing petals



Mimosoideae

Tiny petals, showy stamens



Caesalpinioideae

Five nearly equal petals



If bean family flowers are so different, what holds the bean family together?

BEANS! Their fruits are almost always “legumes” – a simple dry pod that opens along a seam on one or both sides.

LEAVES almost always have 3 or more leaflets (but see...redbud).



White Wild Indigo

Baptisia alba

Dry woodlands, pine flatwoods, roadsides

Stems are up to 4 feet tall, waxy, blue-gray to purplish, topped with an erect flower cluster.

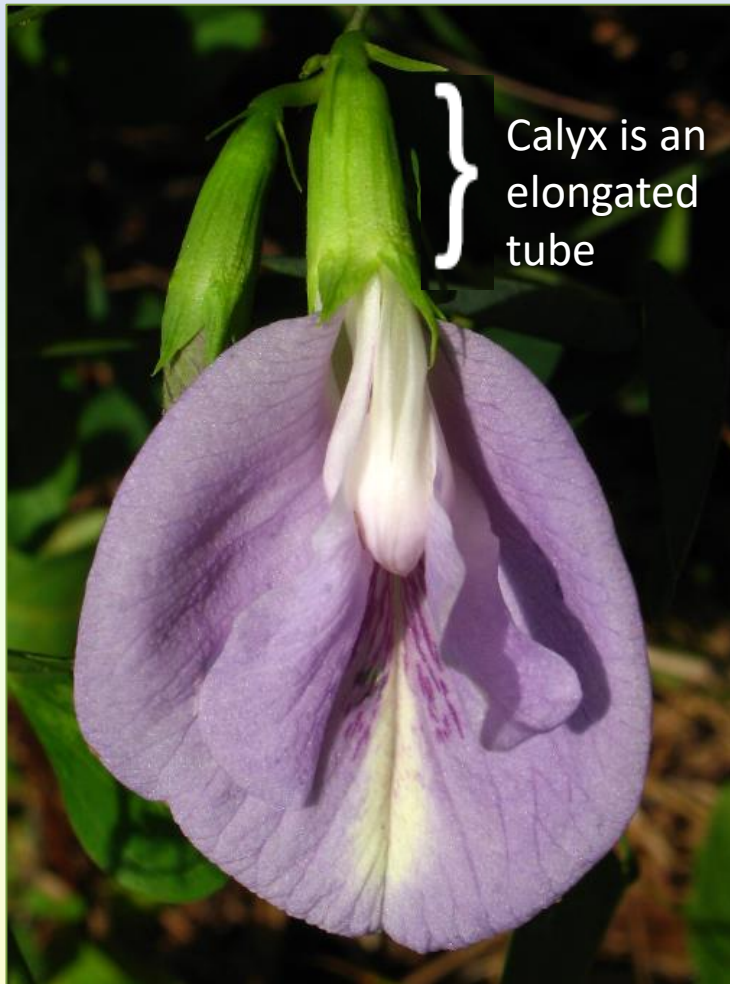
Leaves have three oval leaflets.

Flowers are classic bean-flower-shape with banner, wings, and keel petals.



Pigeon Wing

Clitoria mariana



Leaves of these two species are nearly identical.

Spurred Butterfly Pea

Centrosema virginiana



Calyx is short and cup-shaped

Sundial Lupine

Lupinus perennis

Sandhills, dry woodlands, and roadsides

Leaves with 7 – 11 leaflets in a “sundial” arrangement.

Flowers are typically bean-family shaped, blue to purple, with a large white patch on the banner petal.



Lady Lupine

Lupinus villosus



Sandhills, dry woodlands, and sandy roadsides

Flowers pink or lavender with a large purple patch on the banner petal.

Leaves simple – no leaflets.

Whole plant is covered with long, white or tawny hairs.



Coral Bean, *Erythrina herbacea*

Maritime forests, sandhills,
other dry woodlands



Flower has only one elongated, tubular petal.

Leaves have 3 oddly shaped leaflets.

Legume has constrictions between the red seeds.

Stout taproot helps with fire survival and recovery.



American Wisteria

Wisteria frutescens

Floodplains, swamp forests

Woody vine up to 40 feet long.

Leaves with 9 – 15 leaflets.

Flower clusters drooping, lavender to purple to bluish, only slightly fragrant.



Fruits hairless, cylindrical, constricted between the seeds.

American Wisteria

Wisteria frutescens



Leaflets have flat margins.

Flowers in compact clusters.

Flowers only slightly fragrant.

Fruits are cylindrical (round in cross-section), hairless, constricted between seeds.



Chinese Wisteria

Wisteria sinensis



Leaflets have wavy margins.

Flowers in loose, elongated clusters.

Flowers very fragrant.

Fruits are flattened, velvety-hairy, not constricted between seeds.



Sensitive Briar

Mimosa microphylla



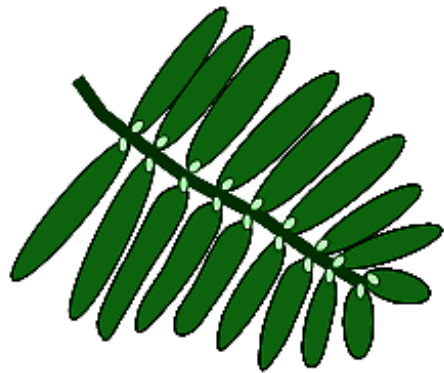
Prickly stems trail along the ground or lean on other plants.

Leaves with up to 11 pairs of leaflets that fold up when touched.

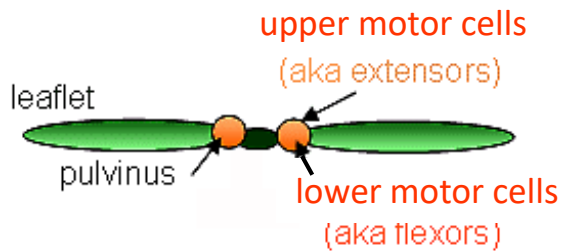


pulvinus,
pulvinii

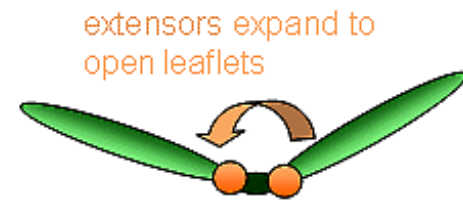
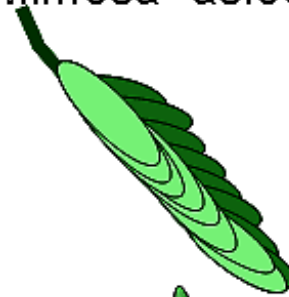




Mimosa "awake"



Mimosa "asleep"



When a leaflet is touched, water moves from cells in the upper part of the pulvinus, causing the upper cells to collapse. The water moves to lower cells causing them to expand which pushes the leaflet up and closed. In a few minutes, the process reverses and the leaflets unfold.

Probably functions as a deterrent to herbivory as it makes the leaves look smaller and less attractive as food. The movement may also dislodge insects.

Partridge Pea

Chamaecrista fasciculata

Chamaecrista nictitans (smaller)

Five, almost equal petals with red blotch at the base.

Stems dark red and hairy.

Leaf stalks with extrafloral nectaries (glands).



Leaflets fold up if touched



Grass Family – Poaceae

What makes a grass a grass?

Grasses are one of the so-called “Graminoids”:
Grasses, Sedges, and Rushes...

“Sedges have edges...



(usually)

Rushes are round and...



(and solid)

Grasses like glasses
are hollow.”



(...or grasses have joints
all the way to the ground)

Grasses go to the Beach

They must be able to tolerate salt spray, heat, wind, dry 'soil,' and constant burial by sand, and they must have deep root systems.



Sea Oats

Uniola paniculata

Sand burial stimulates the buried stems to put out new roots and rhizomes.



Approx 6 feet of roots and rhizomes



Bitter Panic Grass

Panicum amarum

Stems up to 8 feet tall, stout, waxy blue-green, rooting at nodes when blown over.

Leaves thick, firm, large, blue-green.

Root system up to 6 feet deep.

Reproduces largely by spread of rhizomes.

Provides cover and nesting habitat for shorebirds such as the rare Piping Plover and Wilson's Plover.



Pink Muhly, Sweet Grass

Muhlenbergia sericea (barrier islands only)

Muhlenbergia capillaris (more widespread)

Dunes, dune swales, edges of salt marshes

Leaves and stems are stiff and wiry, and appear round in cross section.

Flower clusters large, open, airy, dark pink.



Ms. Yvonne Grovner, Sapelo Island Master Basket Maker, student of legendary Mr. Allen Green.

Saltmeadow Cordgrass, Salt Marsh Hay

Spartina patens

Dunes, edges of salt marshes, sand flats

A Muhly Grass “look-alike,”
but only when vegetative.

Flower clusters are *very* different.

Leaves are sometimes flat rather
than inrolled like Muhly’s.

Spartina is strongly rhizomatous,
forming extensive swards.

Muhly is a bunch grass.





Pink Muhly is a “bunch grass” (cespitose).



Cordgrass spreads by rhizomes, forming extensive networks of rhizomes.

Southern Wild Rice

Zizania aquatica

Freshwater tidal marshes

Stems stout, up to 10 feet tall. Annual!

Leaves up to 5 feet long with sharply toothed edges.



Flower clusters up to 2 feet tall. Upper branches bear female flowers, lower branches bear male flowers.

Sugarcane Plume Grass, Giant Plume Grass

Erianthus giganteus

Synonym: *Saccharum giganteum*

Fresh and brackish marshes, wet roadside ditches

Stems are up to 10 feet tall.

Flower heads start out silvery pink, then turn tan with age.

Upland/inland version is Silver Plume Grass, *E. alopecuroides*.

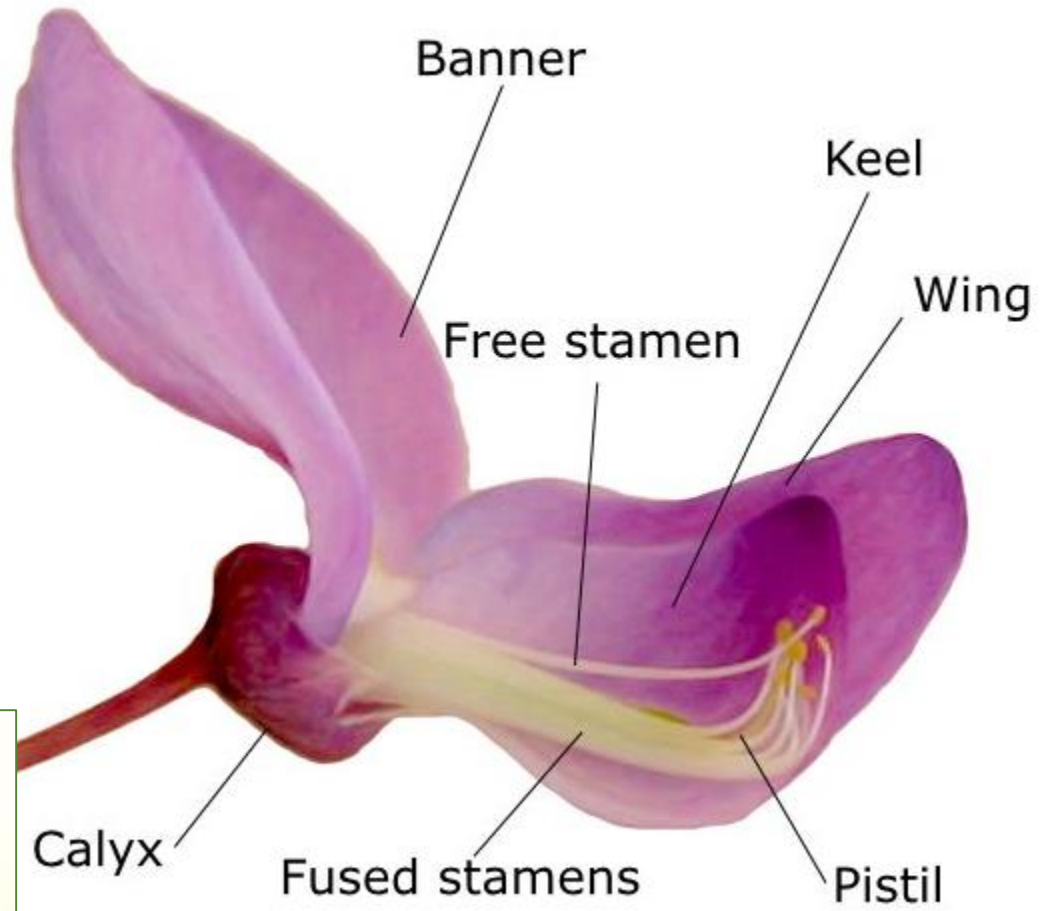


A landscape photograph of a marsh. In the foreground, there is a pond surrounded by tall, golden-brown grasses. The middle ground shows a wide expanse of similar grasses. In the background, a dense line of green trees is visible under a blue sky with light clouds. The text "The End" is overlaid in the center of the image.

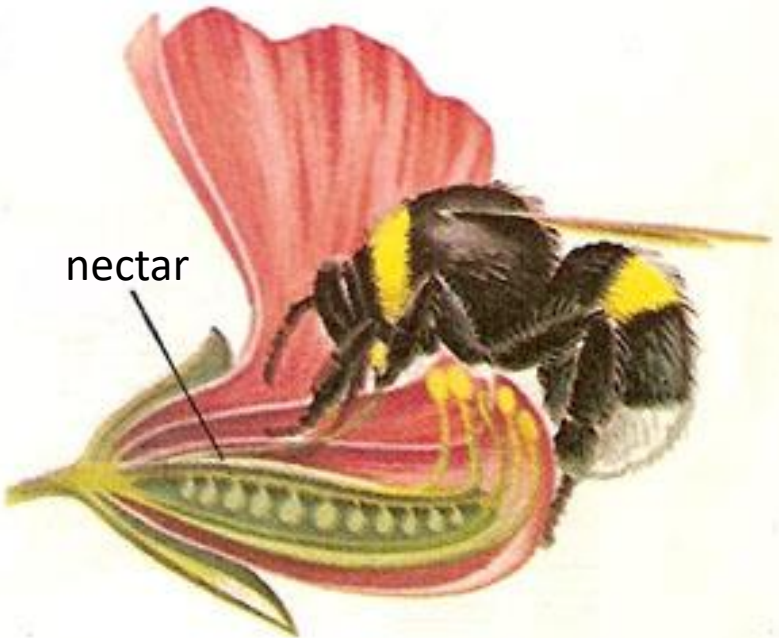
The End

Faboideae

Pea flowers



nectar



Savannah Mountain-mint

Pycnanthemum flexuosum

Moist to wet flatwoods and seepages

The whole plant is hairy, giving it a whitish look.

Rounded flower heads look bristly because of the elongated calyx lobes.

Flowers small, white or pale pink with purple spots.



Excellent pollinator plant, visited by many species of bees and butterflies.