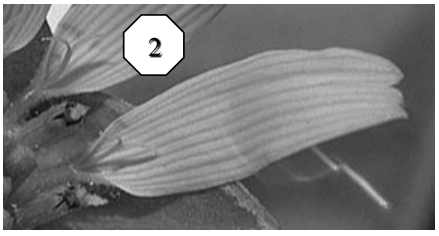
Interesting Inflorescences

Heads, Gynostegiums and Cyathiums

Asteraceae - floral diversity



Main floret types

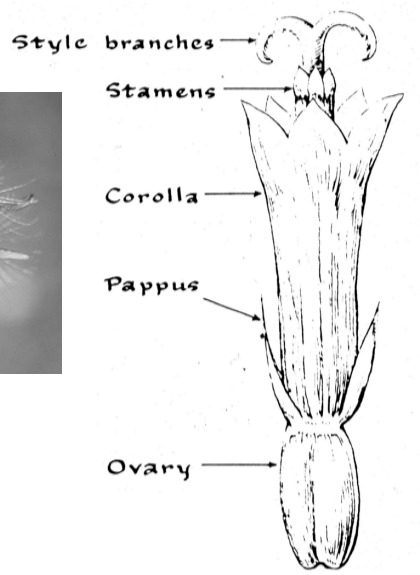
1. Disk or tubular florets are actinomorphic

2. Ray florets are usually 3 long fused petals + 2 short petals

3. Ligulate florets are 5 fused petals but split open

Asteraceae - floral diversity

CA X CO (5) A (5) G $\underline{(2)}$



The fruit is a one-seeded achene with the pappus serving as the fruit disperser (e.g., barbs for animal dispersal, hairs for wind dispersal)

Asteraceae - head diversity

These various types of florets combine to form a number of different looking heads

Radiate head: disk florets in the center, ray florets along the edge (these usually pistillate)

Discoid head: only disk or tubular florets comprise the entire head

Ligulate head: only ligulate florets comprise the entire head

Cichorium - chickory

Asteraceae - tribes

Tribe Lactuceae (Cichorieae)

Krigia biflora - false dandelion

Hieracium - hawkweeds

Asteraceae - tribes

Tribe Cardueae (Cynareae)

Cirsium - thistles

- spiny phyllaries and often leaves and stems
- heads never radiate
- petals white or cynanic colors (blues, purples)
- thistle, knapweed, burdock

Asteraceae - tribes

Tribe Heliantheae

Large tribe with radiate, multi-layered phyllaries, rays mostly yellow, tendency for opposite leaves

Coneflower, sunflower, rosinweed, ox-eye, black-eyed Susan, prairie dock, coreopsis, Peruvian daisy

Ratibida pinnata - coneflower

Helianthus annuus - sunflower

Asteraceae - tribes

Solidago rigida - stiff goldenrod

Tribe Astereae

Conspicuous rays in radiate head, pappus of plumose bristles; asters, goldenrods, fleabanes

Aster novae-angliae - New England aster

Asteraceae - tribes

Tribe Anthemideae

Achillea millefolium - yarrow

Matricaria discoidea - pineapple weed

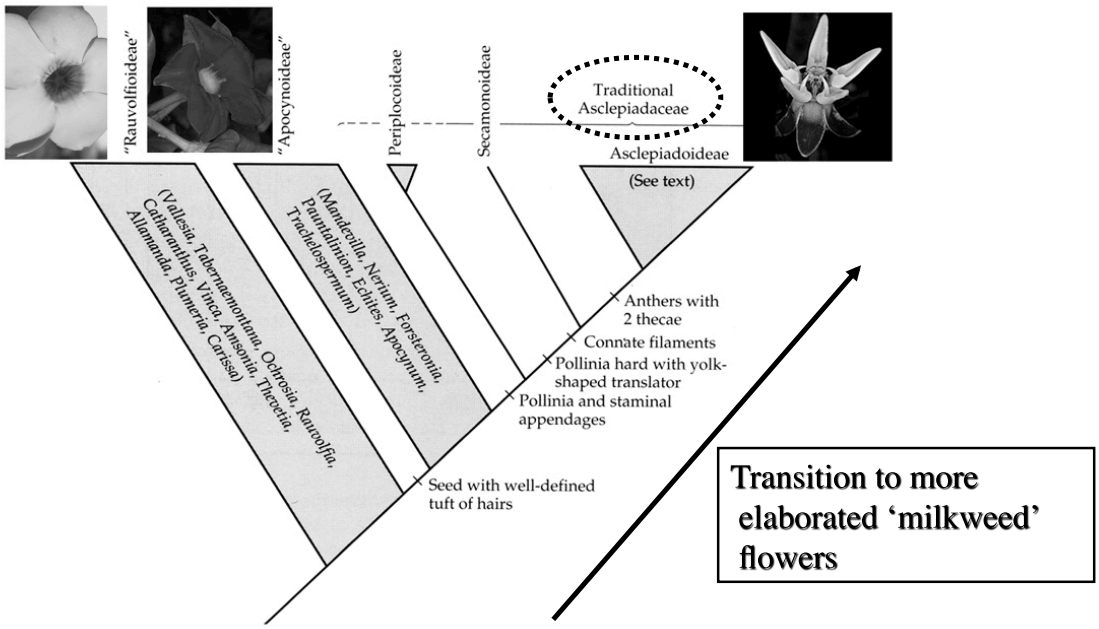
Asclepiadaceae – the milkweeds

Worldwide family of trees, vines, herbs with opposite leaves
415 genera, 4600 species.

Apocynum sibiricum
Hemp dogbane

Asclepias syriaca
Common milkweed

Evolution of the milkweeds



Apocynaceae – the dogbanes

CA (5) CO (5) A 5 G 2 *primitive*

- flowers 5 merous
- left contorted perianth
- 2 separate carpels - follicles

Apocynum androsaemifolium
Spreading dogbane

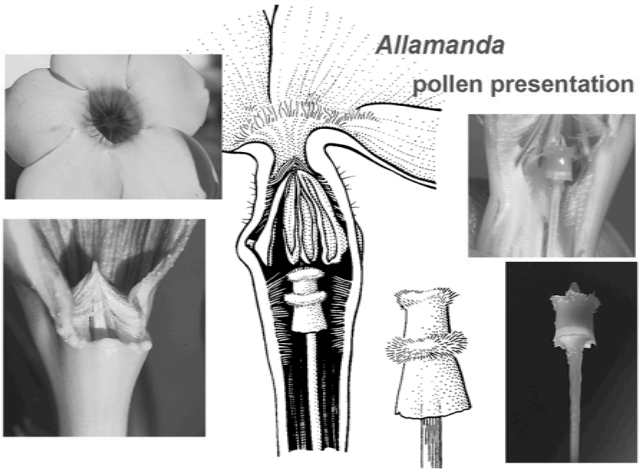
Apocynum sibiricum
Hemp dogbane

Apocynaceae – the dogbanes

CA (5) CO (5) A 5 G 2 *primitive*

- 'pollen presentation' - style plunger or bottle brush to expose pollen

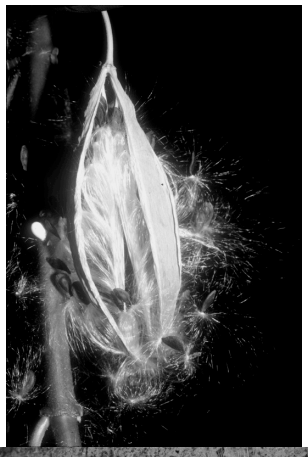
- 5 stamens begin to be connivent

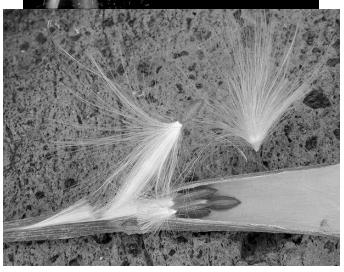


Asclepiadaceae – the milkweeds

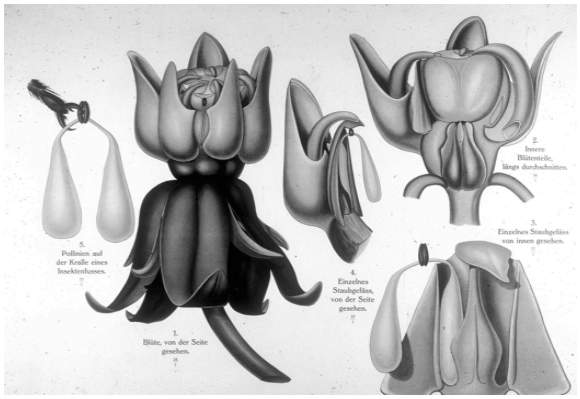
CA (5) CO (5) $\overline{\text{A (5)}}$ G 2 *derived*

- stamens fuse to each other and to style region - gynostegium
- pollen forms pollinia
- more seeds with tufts of hairs



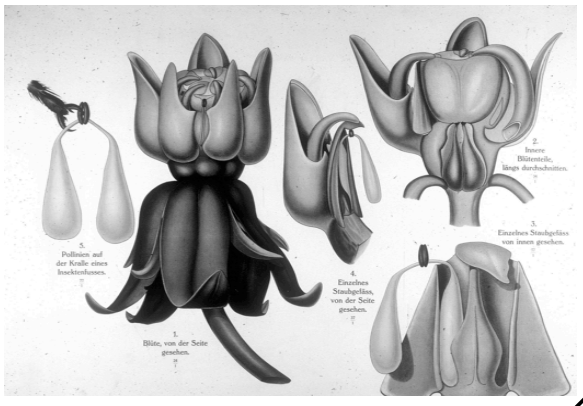


Asclepiadaceae – the milkweeds



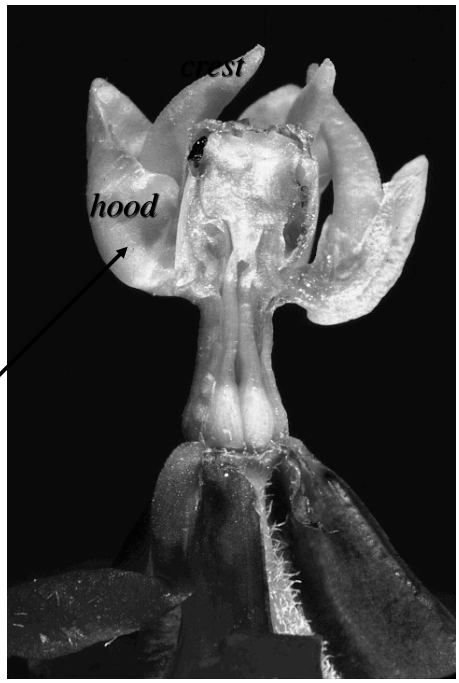
Note 2 free carpels slightly fused at top

Asclepiadaceae – the milkweeds

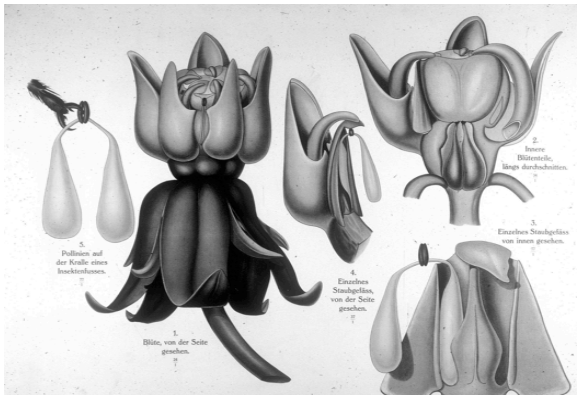


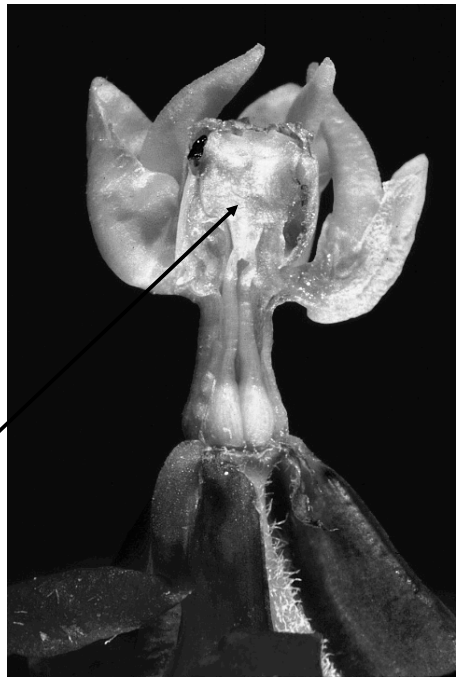
Corona for nectar reward

Corona = hood + crest



Asclepiadaceae – the milkweeds

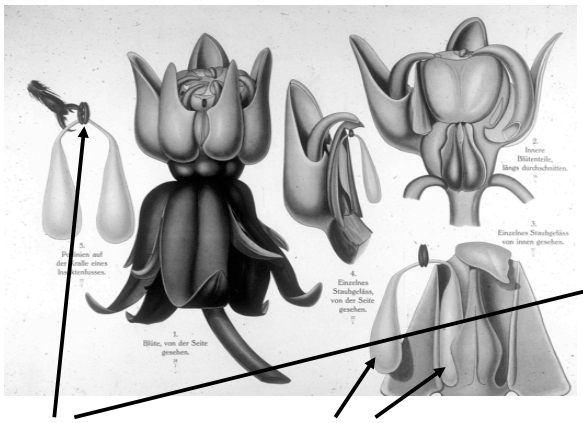


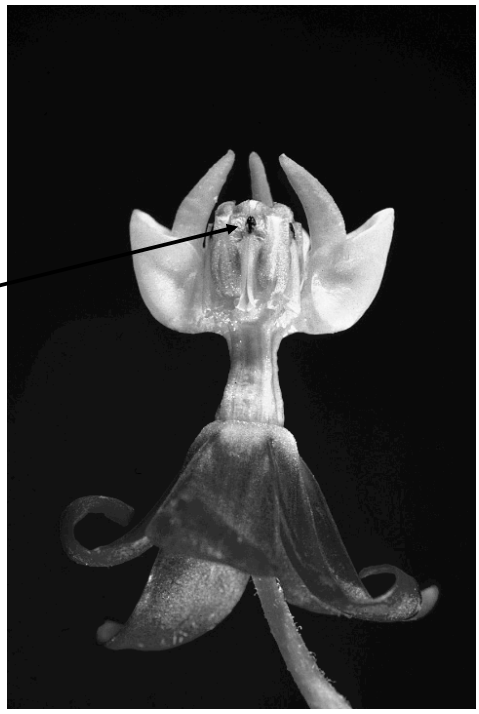


Fusion of 5 stamens and top of gynoecium

Corona = hood + crest
Gynostegium = A + G

Asclepiadaceae – the milkweeds





Gland is attached to 2 pollinia

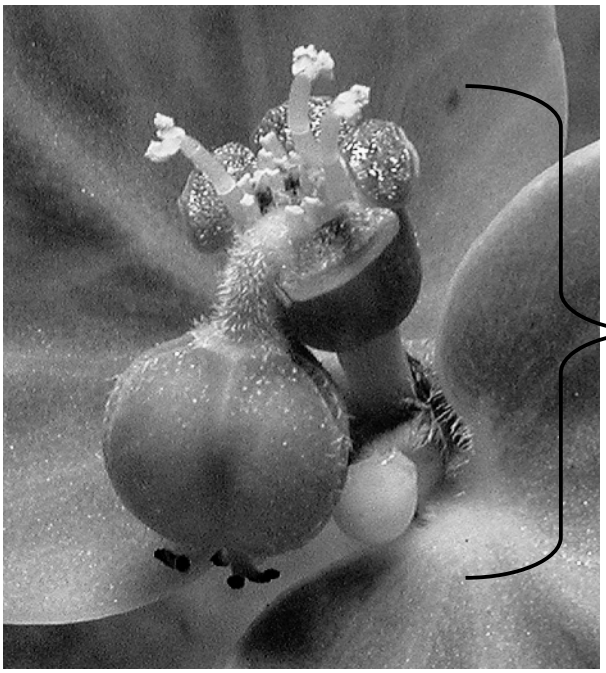
Corona = hood + crest
Gynoestegium = A + G
Pollinia = pollen mass

Euphorbiaceae - spurges

CA 5 CO 0 A ∞ G 0
CA 5 CO 0 A 0 G (3)

Majority of the family has unisexual flowers, 5 sepals, no petals, numerous stamens, 3 fused carpels, and capsules

Euphorbiaceae - spurges



A quite different arrangement of unisexual flowers is seen in many of our spurges of the genera *Euphorbia* and *Chamaesyce*.

Flower or inflorescence?

Euphorbiaceae - spurges

The "flower" of our flowering spurge is actually a highly modified inflorescence = cyathium

Shown here are 3 cyathia; the whole unit here is one cyathium

Euphorbiaceae - spurges

Cyathium is composed of:

glands

appendages of glands

∞ male flowers, 1- stamened (no perianth)

1 female flower (tricarpellate - 3 styles)