Subclass 2. Monochlamydeae

Perianth undifferentiated into Ca. and Co. or absent.

Order: Centrospermae (Caryophyllales) (Curvembryeae)

- ✓ **The order is of interest as indicating a passage from Monochlamydeae to the Dialypetalous type.**

- ✓ **The simplest flower forms of Chenopodiaceae show a similar plan of floral structure to Urticales, while more advanced families are typically dichlamydous reaching in Caryophyllaceae.**

Key to families of order Centrospermae (Caryophyllales)

1a. Stem nodded, dichasially branched, leaves opposite……Caryophyllaceae

1b.Not So.....2

2a. Carpels 2 or more.....3

2b. Carpel one.....6

3a. Fruit achene, inflated.....4

3b. Fruit capsule.....5

4a. Perianth memberanous……Amarantaceae

4b. Perianth herbaceous……Chenopodiaceae

5a. Perianth differentiated into K_2 and C_{4-6}.....**Portulaccaceae**

5b. Perianth single of 5 tepals……**Aizoaceae**

6a Perianth petaloid……Nyctaginaceae

6b. Perianth sepaloid……**Phytolaccaceae**

Family: Amarantaceae

Vegetative characters:

Leaves: With reticulate venation.

Floral characters:

Inflorescence: Dense small showy cymose.

Flower: Small dry pentamerous.

Bract: Colored, scarious, bracteoles present.

Perianth: Undifferentiated into calyx nor corolla, sepaloid.

Androecium: 5 antiposed stamens connate at base forming cup or tube.

Gynoecium: Superior ovary, 3-2 carpels, 1 locule, basal placentation.

9- Fruit: The fruit is generally dry. This may be a nut, drupe or berry.

Floral Formula: Br Brl ⊕ ☿ P 4–5, A 4–5, C(2–3).

10- Economic Importance: The family is of little economic value. A few species are grown as ornamental plants.

11- Common plants:-

1- ***Amaranthus spp.***

2- ***Aerva spp.***

3- ***Alternanthera spp.***

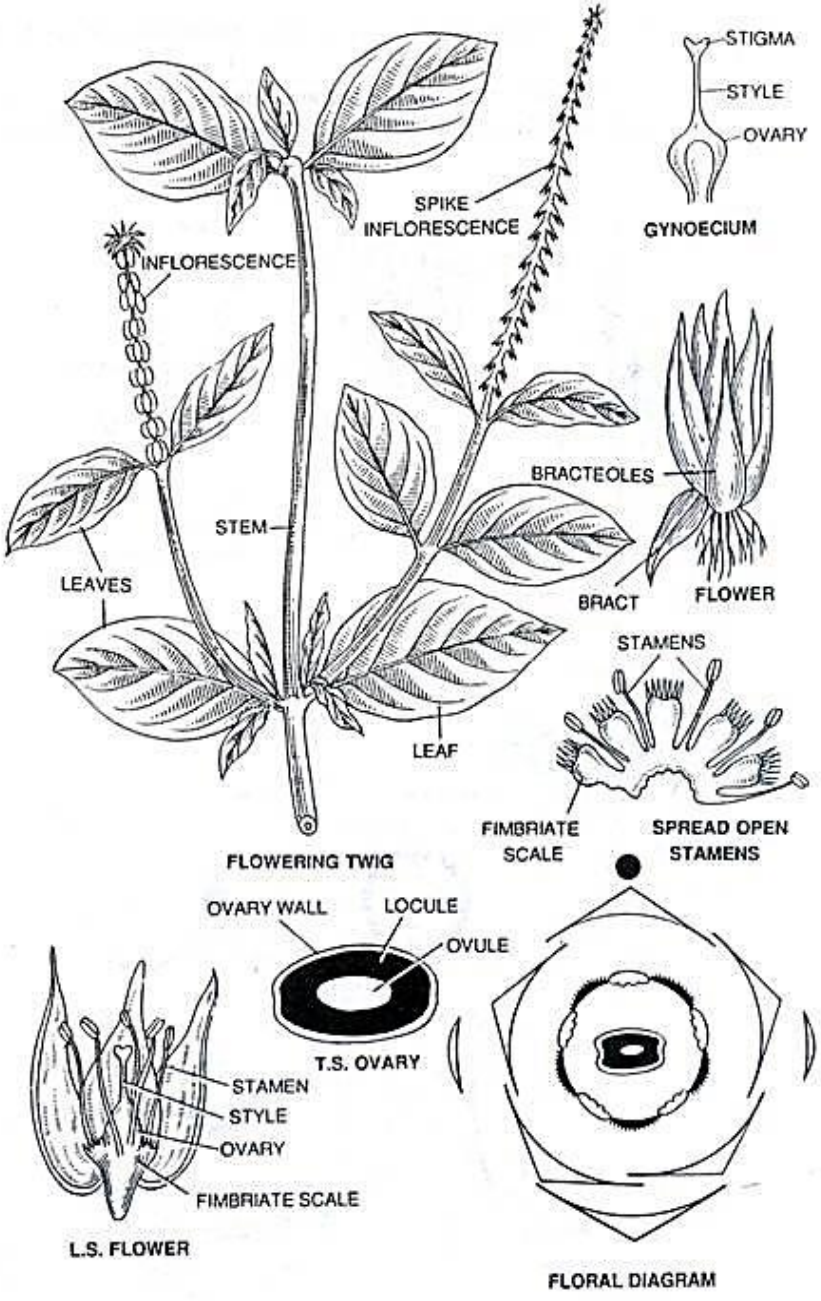


Fig. 24.3. Amaranthaceae. *Achyranthes aspera* Linn.; Verna. **Chirchita, latzira, apmarg.**

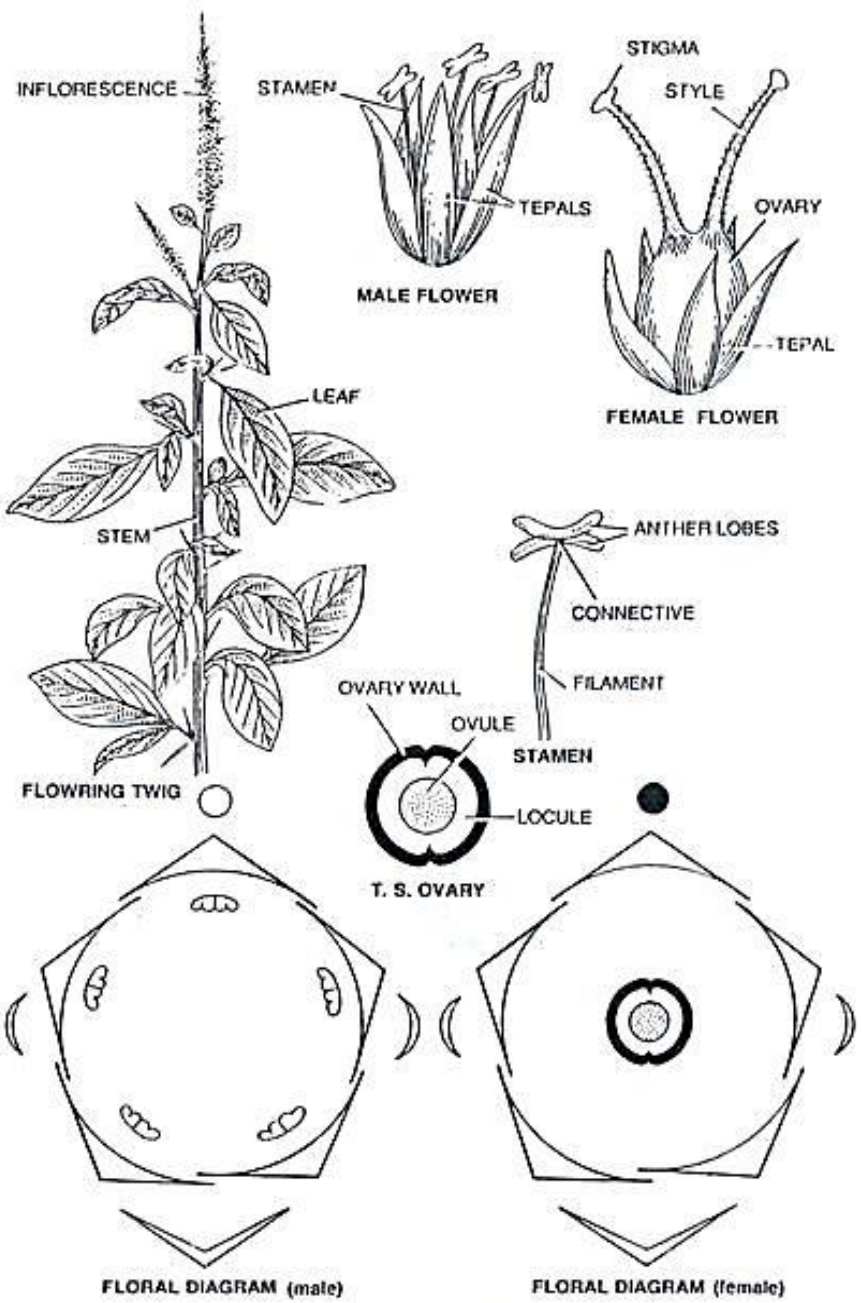


Fig. 24.4. Amaranthaceae. *Amaranthus spinosus* Linn.; Verna. **Jangli chaulai.**

Order: Centrospermae (Caryophyllales)

1- Family: Chenopodiaceae

Habit and diversity: Herbs , or shrubs (some), or trees (few, small), or lianas (few), annuals or perennial, Helophytic to xerophytic (nearly all halophytic), a taxonomically difficult group with 102 genera and about 1400 species.

Roots: Most fibrous tap root except beat which has tuberous root.

Stem: Herbaceous; Cylindrical; dense covering of hairs on stem.

Leaves: Minute to large; simple, fleshy; alternate or opposite; spiral; exstipulate; often scale like; some are completely leafless.

Lamina dissected, or entire

Inflorescence, Dense small green cymose, terminal, or axillary, clusters are arranged on panicles or spike.

Flowers, Minute, or small; regular; actinomorphic, cyclic, pentamerous, hermaphrodite, (rarely unisexual)

Perianth: sepaline 5, 1 whorled

- **Androecium:** **3–5**; usually isomerous with the perianth; **oppositisepalous .**
- **Gynoecium:** (2–)5 carpelled, **syncarpous**; **superior , ovary 1 locular**.
- **Placentation: Placentation basal. Ovules 1 per locule**
- **Fruit: indehiscent** nut **(commonly a utricle)**
  Often enclose by persistant perianth.,
- **Geography, cytology. Temperate to sub-tropical**, Widespread *X* **= (6-)9.**
- **Floral formula: P (5) A (5) G (2-5) Basal placentation**
- **Common plants.**

Beta vulgaris var. rapa	البنجر او الشمندر
Beta vulgaris var. cicla	السلق
Spinacia oleracea	السبانخ
Chenopodium murale	الرمرام
Chenopodium album	الزربيح
Chenopodium ambrosioides	المنتنة

Family: Chenopodiaceae

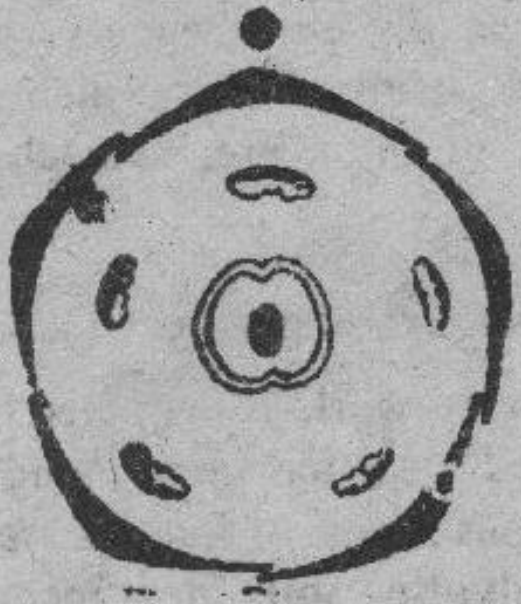
Vegetative characters:

1. **Leaves**: with reticulate venation.

Floral characters:

2. **Inflorescence**: Dense small green cymose.
3. **Flower**: Pentamerous.
4. **Perianth**: undifferentiated into calyx nor corolla, sepaloid.
5. **Androecium**: 5 antiposed stamens.
6. **Gynoecium**: Superior ovary, 2-3 carpels, 1 locule, basal placentation.

⊕ ♂ P_5 A_5 $G_{(\underline{2})}$.



Family: Caryophyllaceae

Vegetative characters:

1.Habit and diversity: quite a large plant Family, with about 2000 species in 80 genera.

2.Stem: nodded, swollen nodes, dichotomously branched.

3.Leaves: Opposite with reticulate venation.

4.Root: Tap rooted and/or rhizomatous with fibrous roots.

Floral characters:

5.Inflorescence: Cymes, thyrses, or capitula, or flowers solitary

6.Flower: Pentamerous or tetramerous, bisexual or occasionally unisexual, actinomorphic.

7.Perianth: Differentiated into calyx and corolla.

8.Calyx: 4 to 5, often imbricate with membranous margin.

9.Corolla: 4 or 5, polypetalous, claw and limb, caryophyllaceous.

10.Androecium: 5 or 10 in two whorls.

11.Gynoecium: Superior ovary, 2-5 carpels, 2-5 locules basally, 1 locule apically, axile placentation basally, free central apically, free styles 2-5, androgynophore present.

12. Fruit: capsule with teeth at apex, achene

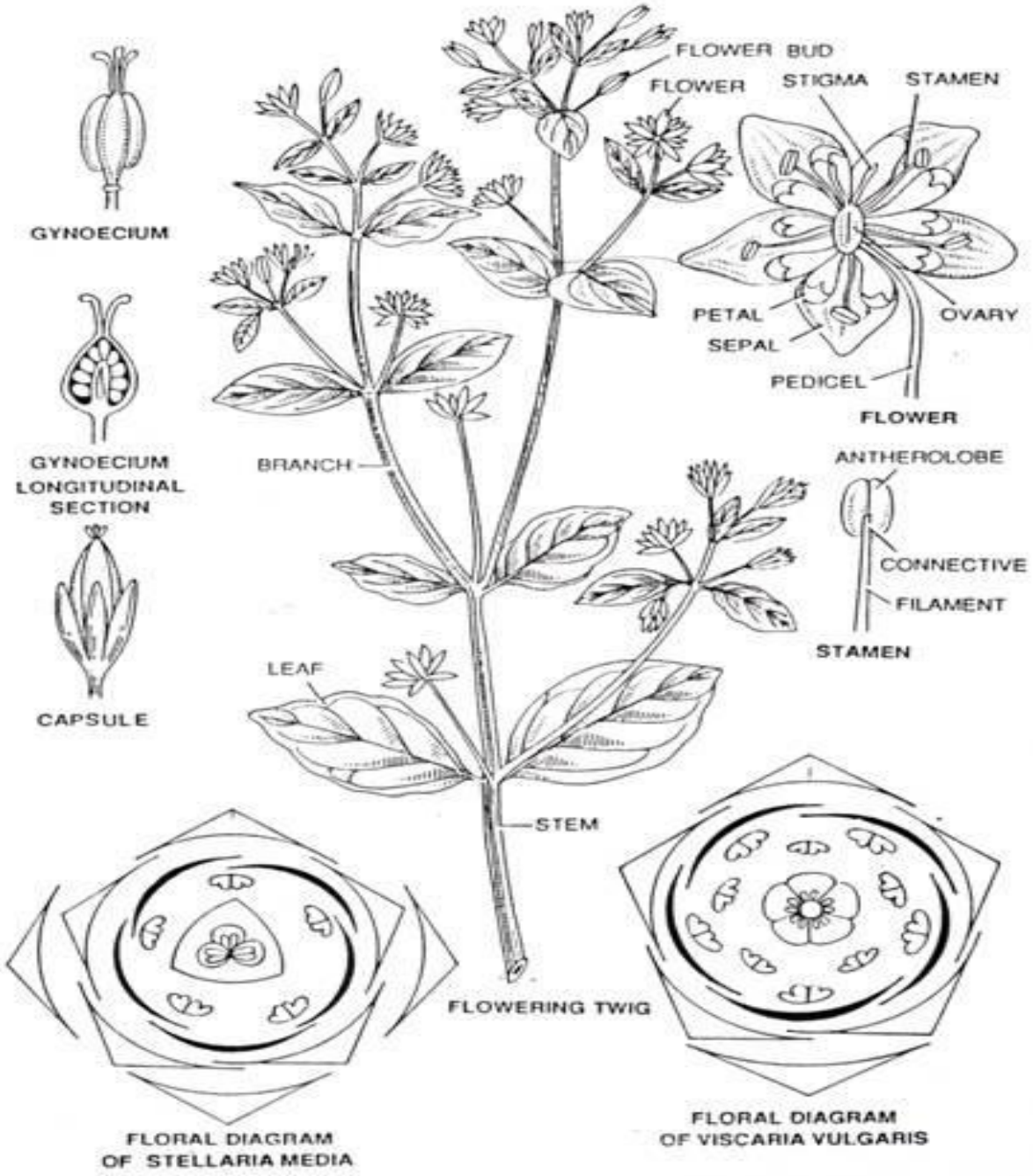
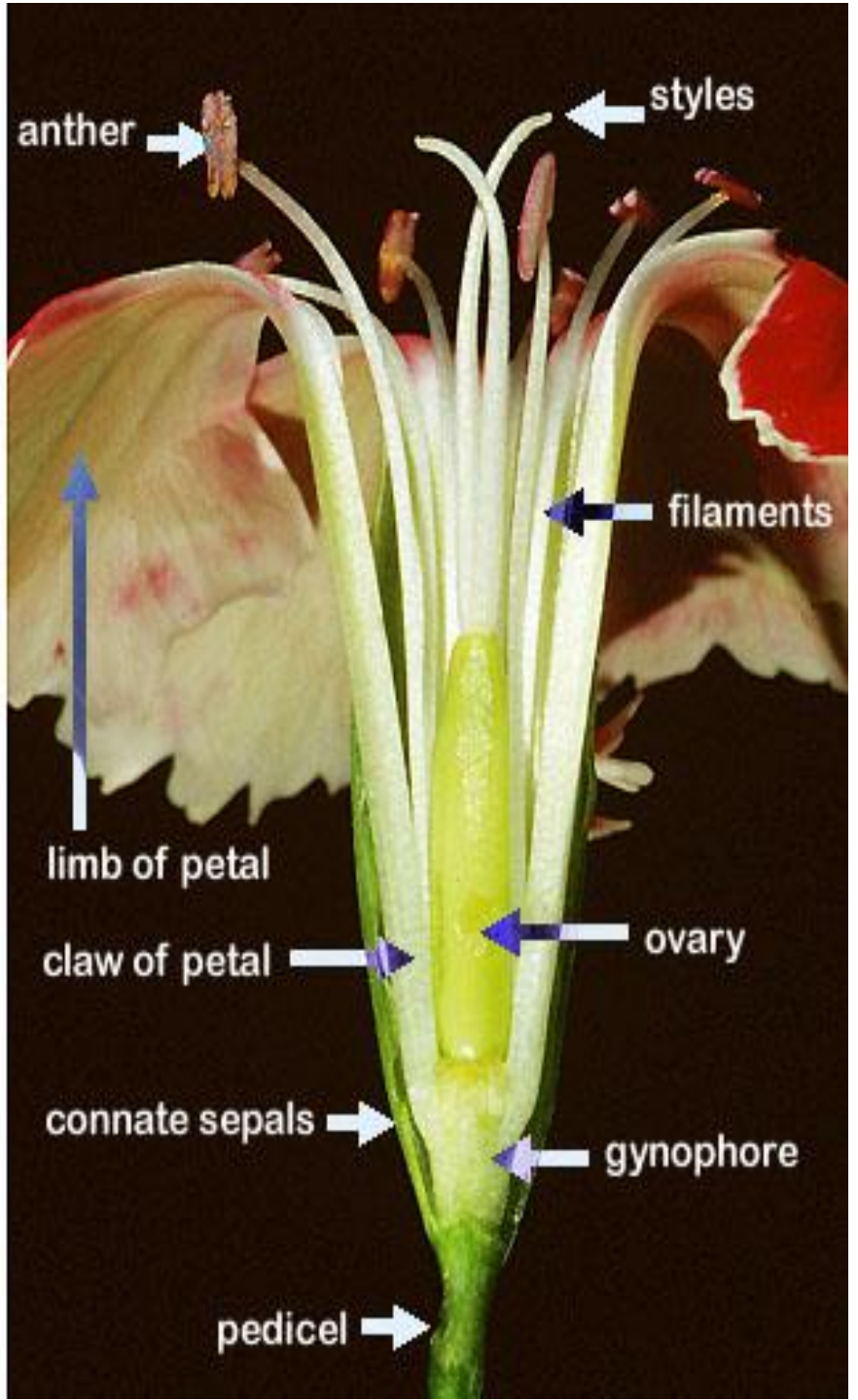


Fig. 23.2. Caryophyllaceae. *Stellaria media* Linn. Eng. Chickweed; Verna. **Morolia.**


appendage of petal
® K. R. Robertson
Illinois Natural History Survey


anther
styles
filaments
limb of petal
claw of petal
ovary
connate sepals
gynophore
pedicel

- **Common plants.**
- *Dianthus caryophyllus* قرنفل
- *Gypsophila elegans* الجبسوفيلا
- *Vaccaria pyramidata* الفاكاريا
- *Stellaria semivestita (anti cancer)*
- *Spergula arvensis (anti T.P)*

3- Family: Nyctaginaceae

Habit and diversity: Herbs, shrubs, trees or less often climbers, 31 genera and about 400 species.

Roots: Roots sometimes fleshy to tuberous.

Stem: Stem frequently swollen at the nodes, sometimes armed with axillary thorns.

Leaves: opposite.

Blades: entire to sinuate, glabrous or pubescent, often drying black.

Inflorescence: terminal or axillary, cymose, paniculate or sometimes capitate ; bracts and bracteoles (1-3) present.

Flowers: usually actinomorphic, hermaphrodite

Perianth: 1 whorled, usually 5-merous.

Calyx: Synsepalous, commonly corolloid, forming a well-developed, often slender, elongate, tubular or urceolate tube,

Corolla: absent

Androecium: stamens as many as calyx lobes, stamens 1-10 (-40), often connate at the base to form short tube, **1 whorled**.

Filaments: mostly unequal in length; intrastaminal annular disc often present around ovary.

Gynoecium: Superior ovary, monocarpellate, unilocular.

Style: long, slender.

Stigma: capitate, penicillate (مخصل)

Placentation: basal, ovule 1 per carpel.

Fruit: an achene.

Geography, cytology. Temperate (a few), or sub-tropical to tropical. *X* = 10, 13, 17, 29, 33 (or more).

Common Plants

- ***Bougainvillea glabra*** **الجهنمية**
- ***Mirabilis jalapa*** **شب الليل**

Family: Nyctaginaceae

Vegetative characters:

1. **Leaves**: with reticulate venation.

Floral characters:

2. **Bract**: Colored.
3. **Flower**: Pentamerous.
4. **Perianth**: Undifferentiated into calyx nor corolla, petaloid.
5. **Androecium**: 5-8 stamens, connate.
6. **Gynoecium**: Superior ovary, 1 carpel, 1 locule, basal placentation.
7. Fruit: **Anthocarp**


a


b

Subclass 3. Sympetalae (Asteridae)

Perianth of united parts, at least the corolla

Order: Contortae (Gentianales)

1. Family: Apocynaceae

Diversity: The family contains 168-200 genera and 2000 species.

Habit and life form. Trees, or shrubs, or lianas or herbs; laticiferous, climbing.

Stem: Often fleshy or woody tubers.

Leaves: simple, entire, opposite or whorled, stipules lacking or minute

Lamina: entire; pinnately veined.

Inflorescence: determinate, sometimes appearing indeterminate, occasionally reduced to a singly flower-terminal or axillary, terminal inflorescence unit usually a panicle.

Flowers: actinomorphic, perfect, hypogynous, showy, bracteate; bracteolate; ; usually 4–5 merous; cyclic; tetracyclic.
Perianth: with distinct calyx and corolla; 10; 2 whorled; isomerous.
Calyx: 5; 1 whorled; gamosepalous; regular; imbricate (quincuncial).
Corolla: sympetalous of 5 lobes.
Androecium: 5. Androecial members adnate (epipetalous); free of one another.
Stamens: 5; isomerous with the perianth; oppositisepalous.
Gynoecium: 2 carpelled, or 2–5(–8) carpelled. syncarpous; superior, or partly inferior.
Style: 1

Placentation: when unilocular, with the two placentas parietal; when bilocular, axile, or apical .

Fruit: a 2 or 1 (by abortion) follicle(s), dehiscent, or indehiscent, or a schizocarp. **seeds with an apical tuft of silky hair**.

Geography, cytology: Temperate (a few), or sub-tropical to tropical (mainly). Widespread. X = 8–12(+).

Common Plants

Nerium oleander	الدفلة
Vinca rosea	الونكة
Plumeria acutifolia	البلوماريا
Thevetia peruviana	السفيتيا



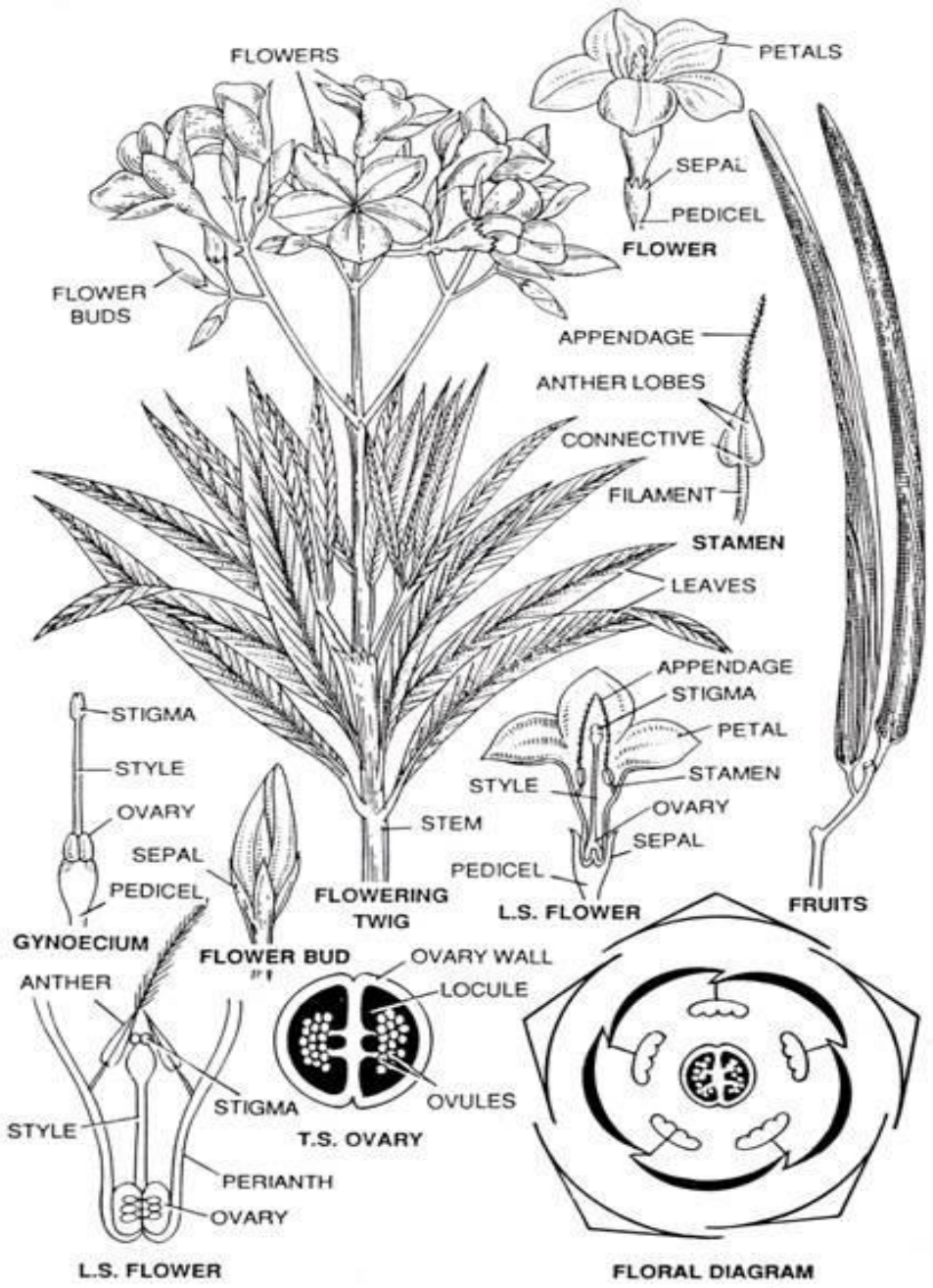


Fig.19.4. Apocynaceae. *Nerium indicum* Mill.; Eng., oleander; Verna, **kaner.**

Floral Formula: $\oplus\ \varphi\ K\ 5,\ \overbrace{C(5),A5}\ ,\ G\ (\underline{2})$.

- **Economic Importance/Fun Facts**

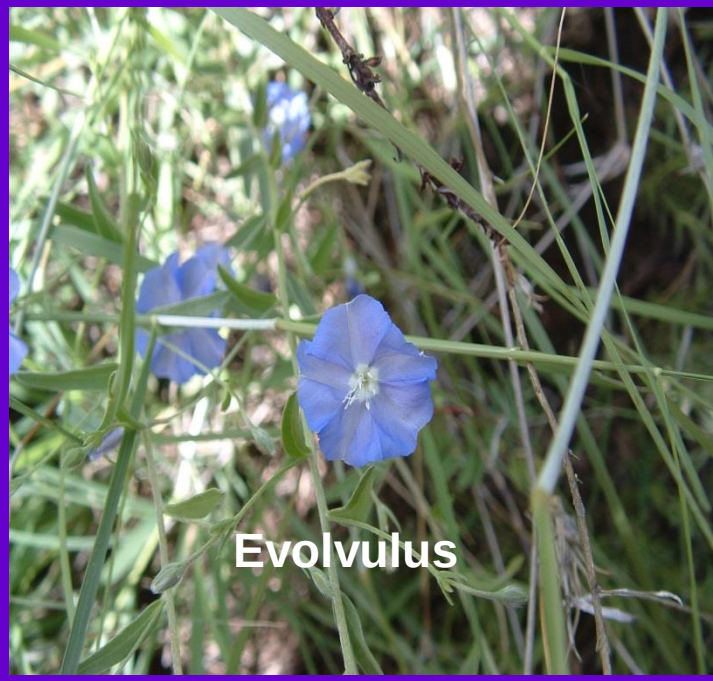
- most taxa **poisonous**, many medicinal
- *Catharanthus* produces a compound used as an **antileukemia** drug
- many ornamentals
- Apocynaceae are known for poisoning livestock
- Oil prepared from *Nerium* root bark is used in skin diseases and leprosy.
- For more details see

http://www.biologydiscussion.com/plants/flowering-plants/an-overview-on-familyapocynaceae-botany/19648

Order Tubiflorae (Solanales)

1- Family Convolvulaceae-The Morning Glory Family

Diversity: 55 genera, 1930 species



Habit & Other Characters

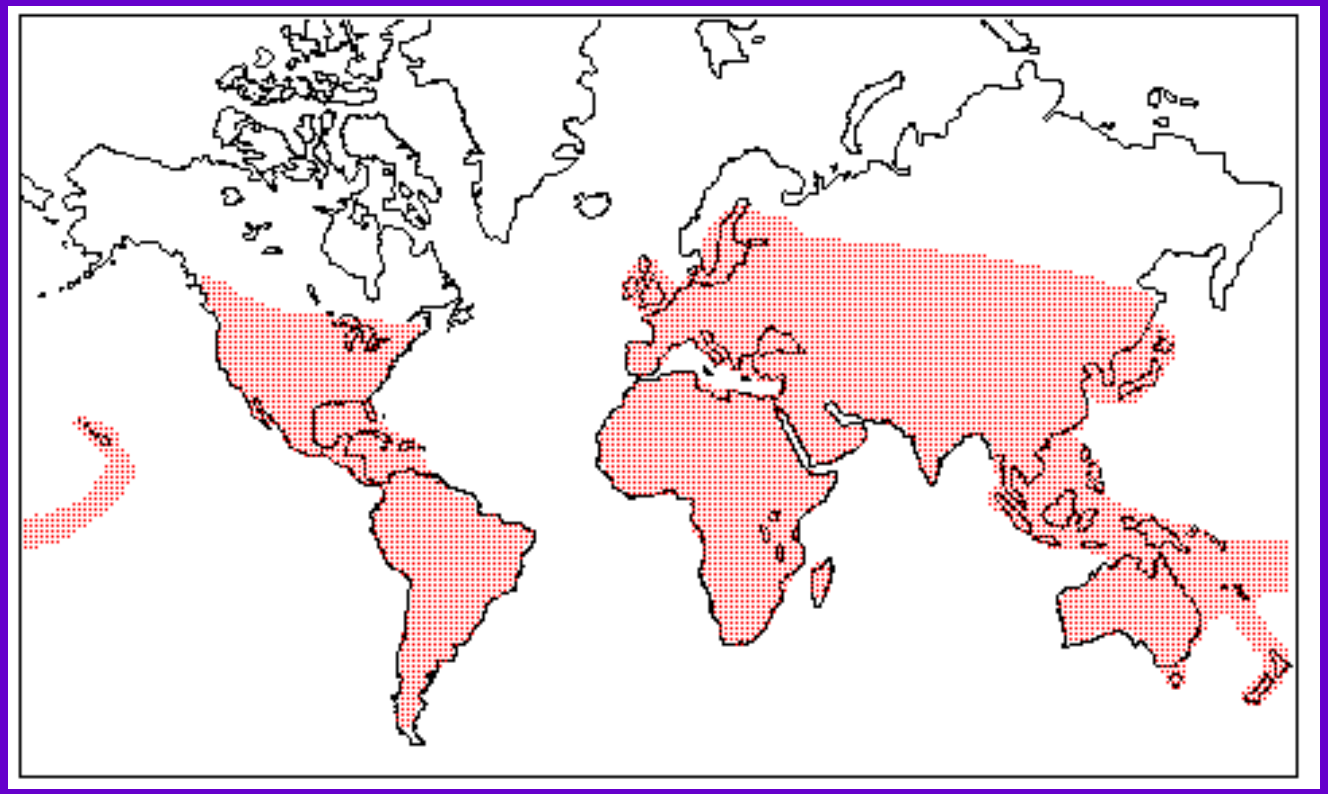
- Usually twining or climbing herbs
- Also shrubs, lianas, or trees (rarely the latter)
- Often have rhizomes
- Sometimes succulent
- Occ. parasitic w/little or no chlorophyll
- Laticifers usually present, containing milky sap, occ. alkaloids present
- Various types of trichomes, 2-branched or simple

Leaves

- Alternate and spiral
- Simple
- Usually entire, but sometimes pinnately or palmately compound or lobed; sagittate
- Pinnate or palmate venation
- Exstipulate

Distribution

Cosmopolitan, but most diverse in tropics and subtropics
centers of diversity in Africa and the Americas



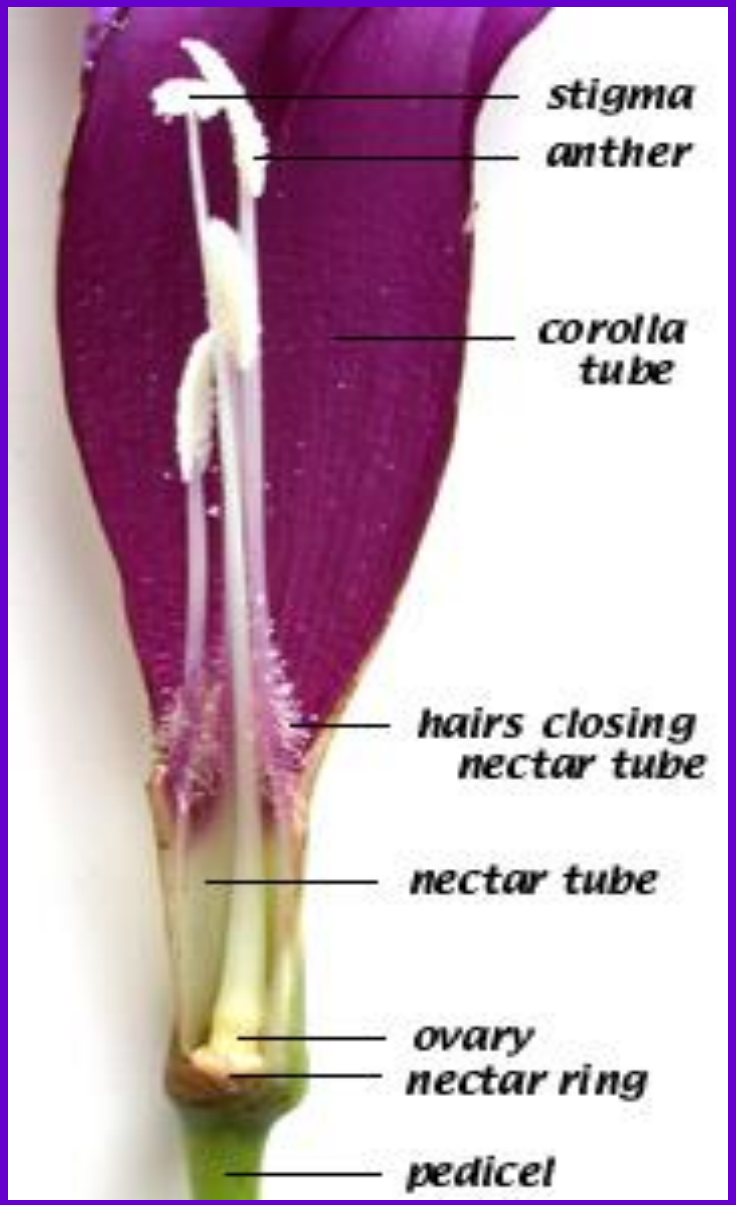
Cuscutaceae/Cuscutoideae

Flowers

- Inflorescences
  - Solitary or in cymes
  - Often subtended by involucre of bracts
- Usually actinomorphic to somewhat zygomorphic
- Bisexual & Usually monoecious
- Perianth
  - Usually 5 persistent, imbricate sepals, distinct to slightly connate
  - Usually 5 connate petals
    - Clearly plicate (folded like a fan)
    - Valvate (petals arranged edge to edge but not overlapping)
    - Corolla funnel-shaped, tubular, bell-shaped, or pitcher or urn-shaped
- Flowers usually subtended by bracts & bracteoles

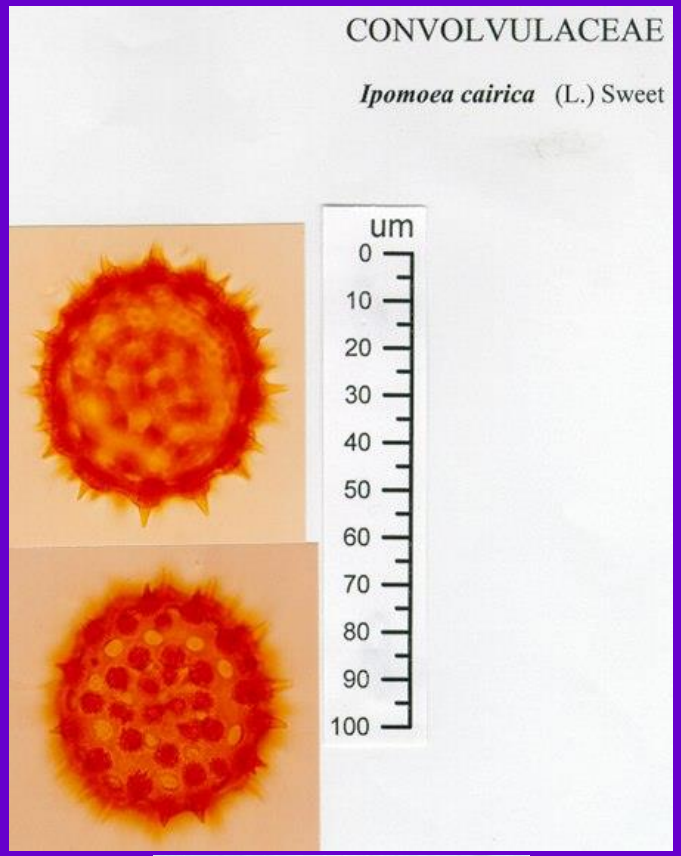
Gynoecium

- 2(-5) connate carpels
- Superior ovary
- 1-5 locules, usually 2
- Placentation usually axile or basal
- Ovary entire or deeply 2-4 lobed
- Style terminal to **gynobasic**
  - style attached to the gynobase—elongation or enlargement of the receptacle—seen in Boraginaceae flowers
- 1-2 capitate, lobed, or linear stigmas
- Nectar disk present and usually lobed



Androecium

- Usually **5 epipetalous** stamens, often of unequal lengths
- **Oppositisepalous** (in front of the sepals)
- Anthers dehisce longitudinally
- Pollen tricolpate to multiporate; often spiny



Fruit

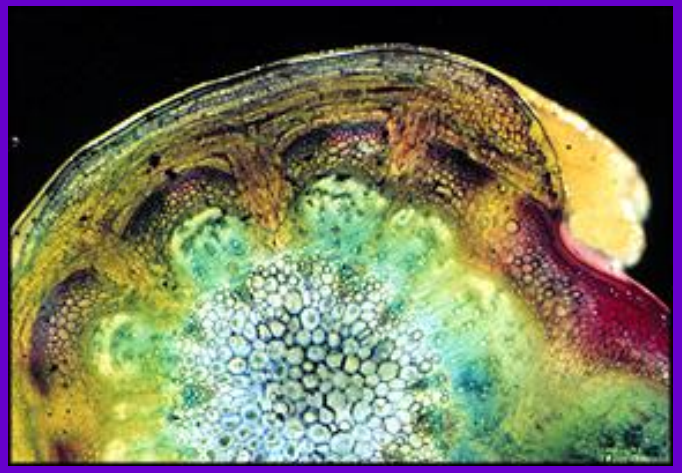
- Septifragal capsule
- Circumscissile capsule
  - dehiscing along transverse circular line so top opens like a lid
- Loculicidal capsule
- Irregularly dehiscing capsule
- Papery and inflated
- Also berry, nut, or utricular fruit
- Albuminous seeds
- Embryo straight or curved

Habitat & Ecology

- Tropical rainforests, savannas, prairies, deserts
  - Usually at low elevations but some spp. grow up to 3000 m
- Corolla open for a few hours to a day
- Typically showy flowers attract insects
  - Usually bees but also moths
- Bats and birds also pollinate
- Some *Ipomoea spp.* are hummingbird-pollinated
- Large seeds probably dispersed by wind, but also water and animals
- Several introduced spp. in N. America

Cuscuta spp. (dodder)

- Holoparasites, lacking chlorophyll
- On the USDA's Top Ten Weeds List, often affecting cucurbits, plants in nurseries, and other crops
- Rarely kill hosts
- Can germinate and attach to host in less than 24 hours
- Haustoria penetrate phloem, sometimes xylem, extracting CHOs, water, and solutes
- Roots last only until attachment to host
- Leaves are inconspicuous scales
- White or pink flowers
- Some native and some introduced spp. in the US

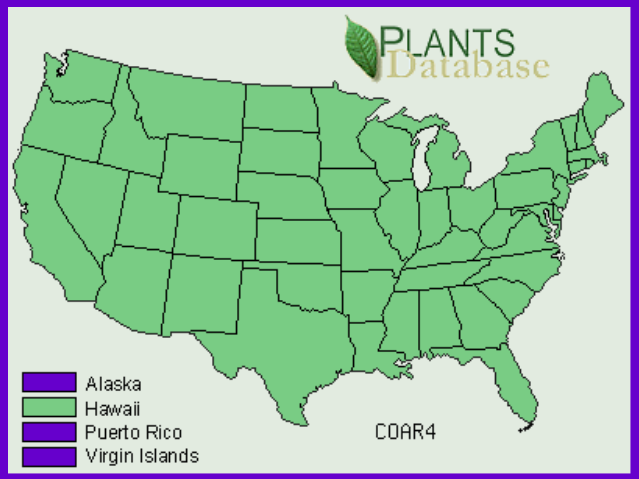


Convolvulus arvensis (field bindweed)

- Invasive species in N. America; European native
- Sagittate leaves
- Creeping perennial herb/vine
- Rhizomes grow as deep as 6 m! (19')
- Seeds can remain viable for up to 50 yrs!
- Spread from crop seed, livestock feed, & livestock
- Attaches to native plants in attempt to gain access to light

- Flowers white or pink with white stripes arranged in star-shape
- Unilateral raceme w/flowers along one side
- Trumpet-shaped corolla
- Vanilla-like odor

- Stem used to tie plants together
- Green dye
- Stimulates immune system
- Contains anti-cancer agents



Economic Importance

- *Ipomoea batatas*
  - Sweet potato (edible root)
  - 7th largest food crop globally
  - Native to New World tropics
  - Used for red dye in alcoholic beverage, masato, in the Amazon
- Strong purgatives and laxatives; many other uses
- Several *Ipomoea spp.* used to treat boils
- Drug uses
  - *Ipomoea tricolor*, a native American sp., has seeds containing small amounts of hallucinogenic alkaloids used by Native Mexicans and later used by people throughout N. America during the ’60s and ’70s
- Ornamentals
  - Cultivated for beautiful flowers
  - *Ipomoea tricolor*, *I. purpurea*, *Evolvulus*, *Convolvulus spp. (C. tricolor)*

Order: Tubiflorae

1.Family: Convolvulaceae - The Morning Glory Family

Diversity: Herbs, mostly twining without tendrils, some shrubs, and rarely trees in about 50 genera and 1,500 species.

Habit and leaf form: Herbs (mostly, climbing or trailing), or shrubs, or lianas, or trees. Trailing or climbing.

Leaves: alternate; spiral; non-sheathing; simple; exstipulate.

Lamina: dissected, or entire; when dissected, pinnatifid, or palmatifid; pinnately, or palmately veined; cross-venulate; cordate, or hastate, or sagittate.

Inflorescence. Flowers solitary, or aggregated in cymes.

Perianth: with distinct calyx and corolla; 10; 2 whorled; isomerous.

Calyx: 5; 1whorled; persistent; imbricate.
Corolla: 5; 1 whorled; gamopetalous; valvate and plicate, or contorted and plicate; tubular.
Androecium: 5. Androecial members adnate (to the base of the corolla); free of one another; 1 whorled.
Stamens: 5; inserted near the base of the corolla tube.
Gynoecium: 2(–5) carpelled. syncarpous; superior. Carpel when the ovaries are free, (1–)2 ovuled.
Nectar disk present and usually lobed
Placentation: basal. Ovary (1–2(–5) locular.
Fruit: A capsule, or a berry, or a nut. Capsules loculicidal, or circumscissile, or splitting irregularly.
Geography, cytology: Temperate to tropical. Cosmopolitan. X = 7–15(+).

Common Plants

Convolvulus arvensis
Ipomoea batatas
Ipomoea tricolor
Cuscuta pedicellata
Cressa cretica

***Cuscuta* sp**

Ipomoea cairica

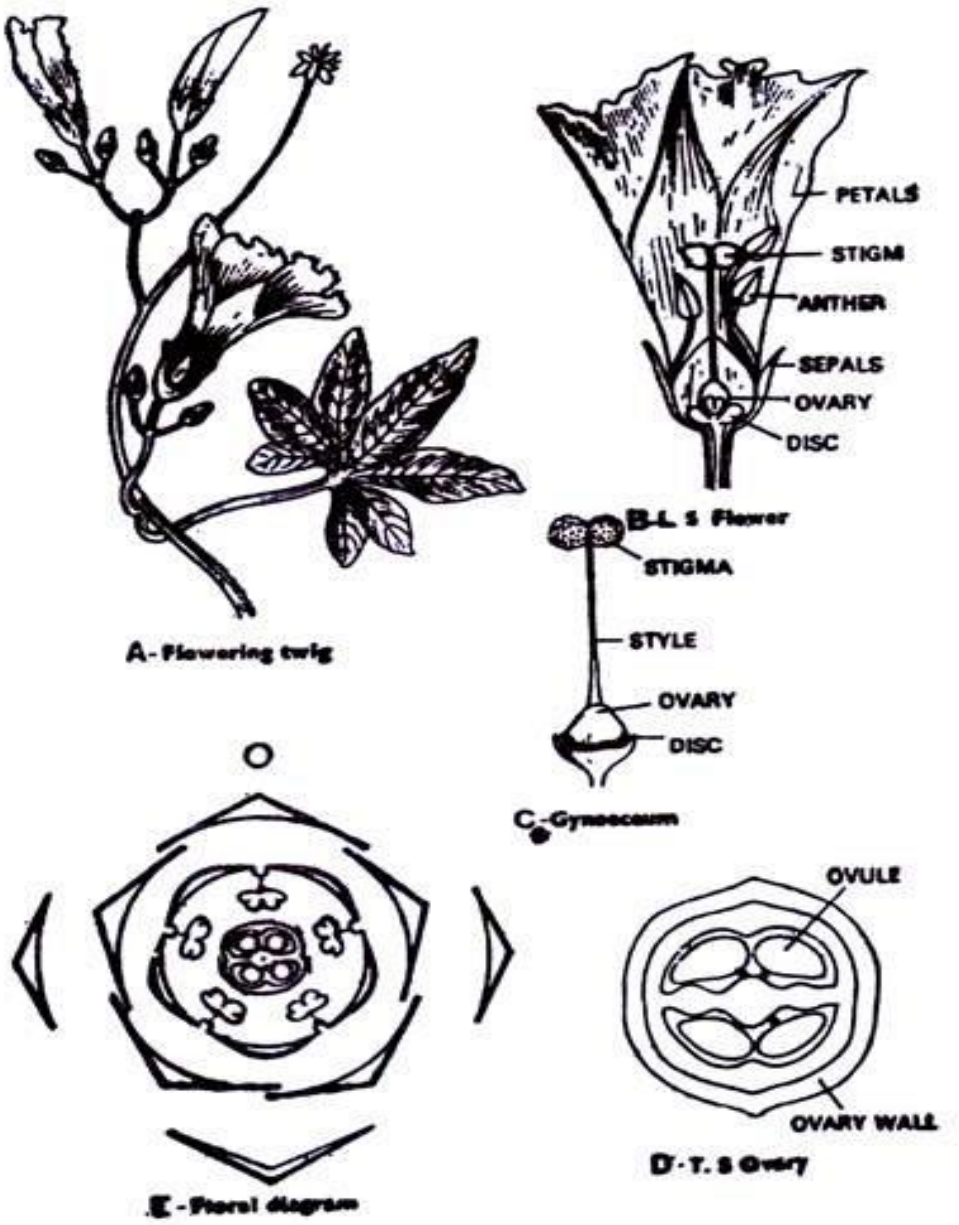


Fig. 77.1. *Ipomoea palmata.*

$$CA^{5}\ \underbrace{CO\,(5)\,A^{5}}\ \underline{G}^{(2)}$$

2- Family Solanaceae

Diversity: 85 genera and 2,800 species.

Habit: Annual, biennial or perennial herbs, or small tree and lianas.

Roots: Fibrous or tuberous tap root.

Stem: Herbaceous; cylindrical, branched, woody below; sometimes underground stem (tuber).

Leaves: Petiolate; alternate or opposite; simple; exstipulate.

Lamina: dissected, or entire; when simple/dissected, pinnatifid, or spinose; cross-venulate.

Inflorescence: Terminal or lateral cyme or solitary.

Flower: Pedicillate; ebracteate; actinomorphic or zygomorphic; complete; hermaphrodite; hypogynous; heterochlamydeous.

Calyx: 5 sepals; fused (gamosepalous); green; often much enlarged in the fruit.

Corolla: 5 petals; gamopetalous; bell shaped or funnel shaped.

Androecium: 5 stamens; epipetalous; alternating with petalsanther free or united; basifixed.

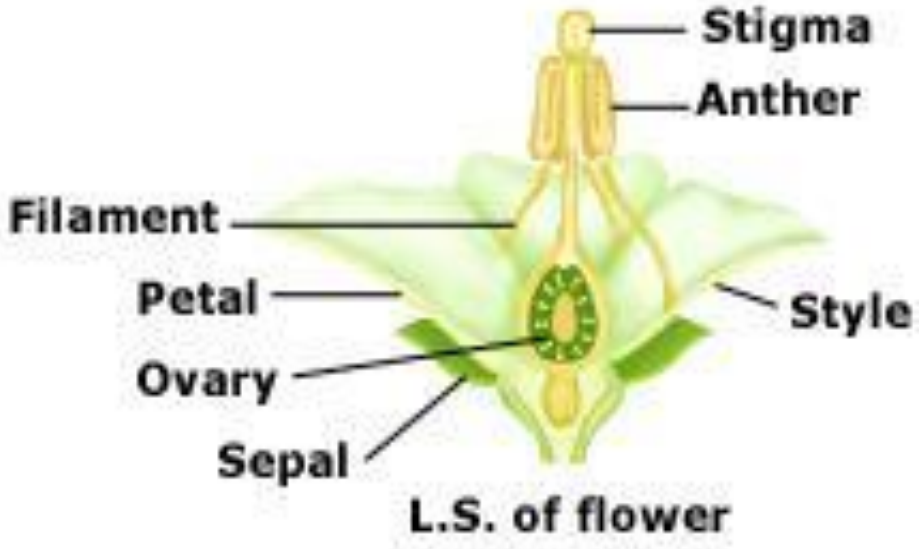
Gynoecium: Bicarpellary; syncarpous; ovary superior; obliquely placed; bilocular, sometimes, become multilocular by the . formation of false septum.

Styles: 1.

Placentation: axile.

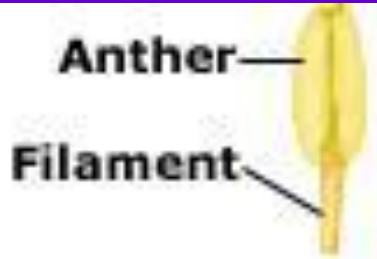
Fruits: Capsule (Datura), Berry (Solanum nigrum).

Geography, cytology: Temperate to tropical. Absent only from cold regions, but with greatest diversity in Central and South America. X = 7–12(+).

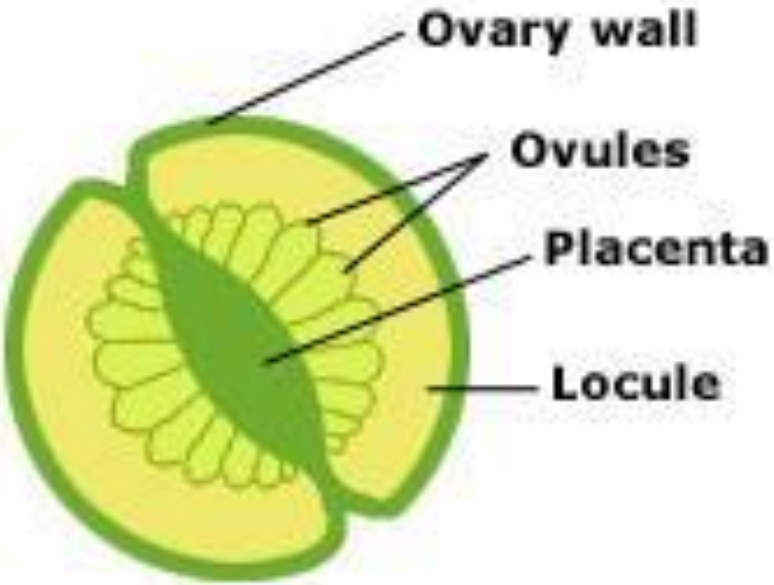


Habit and L.S. of flower of *Solanum nigrum*

Epipetalous stamens



A stamen



T.S. of ovary

Floral diagram

EBr ⊕ ♀ $K_{(5)}\,C_{(5)}\,A_{(5)}\,\underline{G}_{(2)}$

Economic Importance

Food: Many plants of this family are used as food.

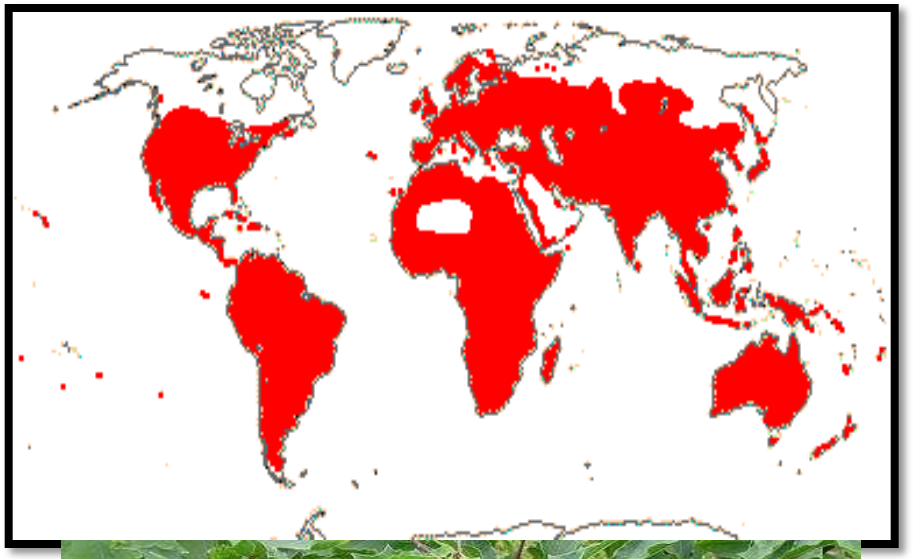
- ***Solanum tubersum*** (potato-white or Irish potato): It is an important plant in this family. It is used as food. The people of Ireland completely depend on potato for food.
- ***Lysopersicum esculentum*** (tomato): Once it was believed to be a poisonous plant. Now it is used as a vegetable.
- ***Solanum melangena*** (egg plant or brinjak'): It is also used as food.
- ***Capsicum annum*** and ***Capsicum frutenscens*** are rich in vitamin C and Vitamin A. They are used as condiments .

- ***Physalis peruviana*** الحرنكش

Medicinal

- ***Nicotiana tobacum*** (tobacco), alkaloid content.

- ***Atropa belladona:*** **used for making belladona plasters. Atropine is a medicinal extract.**
- ***Hyoscyamus niger*** **(henbane) used as sedative**
- ***Withania somnifera*** **used as an aphrodisiac.**
- ***Datura stromanium*** **used as sedative and intoxicant.**



Ornamental

- ***Cestum nocturnum*** مسك الليل
- ***Petunia*** sp
- ***Browalia*** sp بروواليا

Order: Lamials

Family: Lamiaceae (Labiatae) - The Mint Family

Diversity: 200 genera; 3,200 species

Habit and life form. annual to perennial, herbs, rarely shrubs or trees

Stem: very often square.

Leaves: opposite or whorled, simple, often serrate (toothed) margin, exstipulate, often hairy with oil secreting glands

Lamina: dissected, or entire; when dissected, pinnatifid, or palmatifid

Inflorescence: raceme or cyme, in whorls or leaf axils.

Flowers: minute to medium-sized; zygomorphic; tetracyclic, bisexual.

Perianth: with distinct calyx and corolla; 4–10; 2 whorled.

Calyx: 5, united, sometimes bilabiate (two lips), 1 whorled.

Corolla: 5, fused into a tube, bilabiate (2 petals upper/3 lower); 1 whorled.

Androecium: 2 or 4 didynamous (=in two, paired lengths), epipetalous.

Gynoecium: 2 carpels (bicarpellary), syncarpous pistil present on **nectar secreting disc**, ovary superior, **bilocular** when young, but becomes **tetralocular** in the later stage, **single** ovule in each loculus.

Styles. **single** style arising from between the ovary lobes (gynobasic)

Stigmas: 2, or 1; 2 lobed.

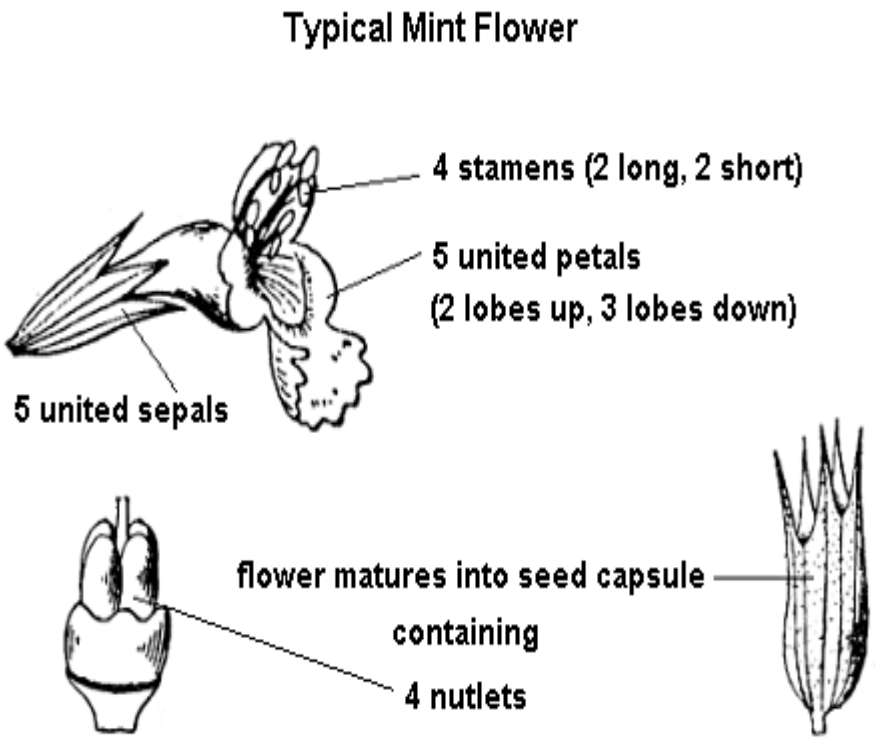
Placentation: axile, 4 ovules, pistil present on nectar secreting disc

Fruit: **2-4** nutlets in a group.

Geography, cytology. Frigid zone to tropical. Cosmopolitan. X = 5–11(+).

Common Plants

Salvia splendens	السالفيا
Ocimum basilicum	الريحان
Mentha sativa	النعناع
Rosmarinus officinalis	حصى اللبان
Organum vulgare	البردقوش
Thymus vulgare	الزعتر



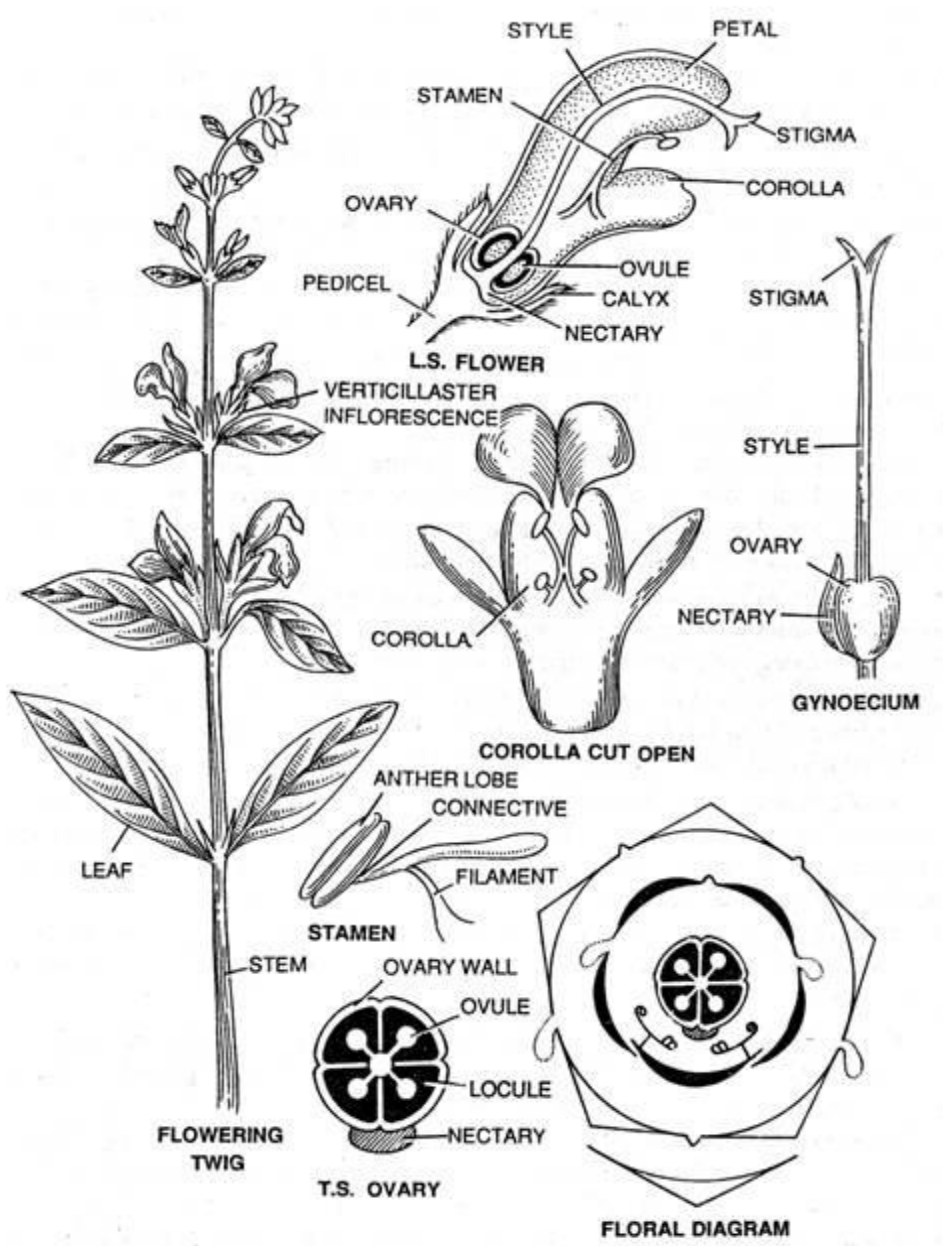
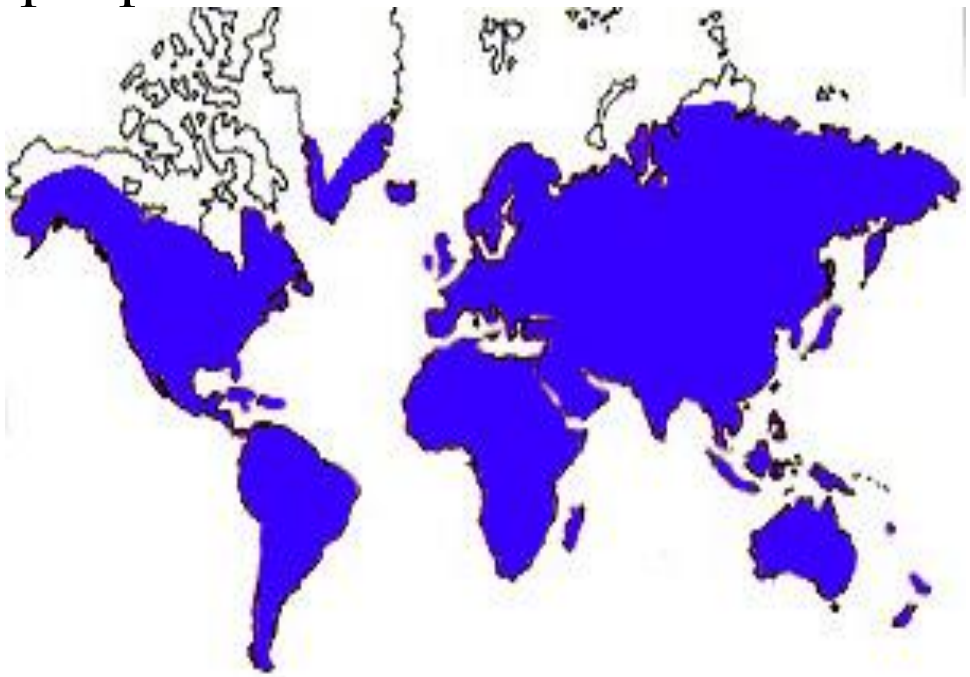


Fig. 28.2. Labiatae (Lamiaceae). *Salvia officinalis* Linn; Eng. sage; Verna. **salbia sefakuss.**

Floral Formula: $\oplus\ \delta\ K\,(2+3),\ \overline{C(4+3), A\,2}, G\underline{(2)}.$

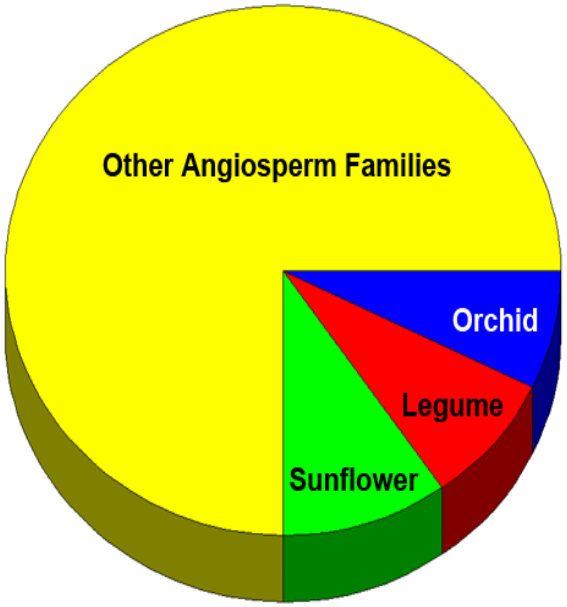
Economic Importance of Family-Lamiaceae (Labiatae):

The family is of little economic value. Some plants are grown in the gardens as ornamentals; some plants yield essential oil while certain possess medicinal properties.



Order: Asterales
1. Family: Asteraceae (Compositae)
The Sunflower Family

Diversity: The largest family of flowering plants; the family contains nearly 1550 genera and 24,000 species.



One fourth of all the species of flowering plants belong to three families: Asteraceae, Fabaceae & Orchidaceae

Habit: Annual or perennial herbs or small shrubs or few small tree or climbers.

Roots: Fibrous tap root.

Stem: Herbaceous; erect or prostrate; cylindrical, hairy, branched, with milky latex.

Leaves: Simple, alternate or opposite, (rarely opposite or whorled), exstipulate, petiolate, reticulate venation, often in basal rosettes

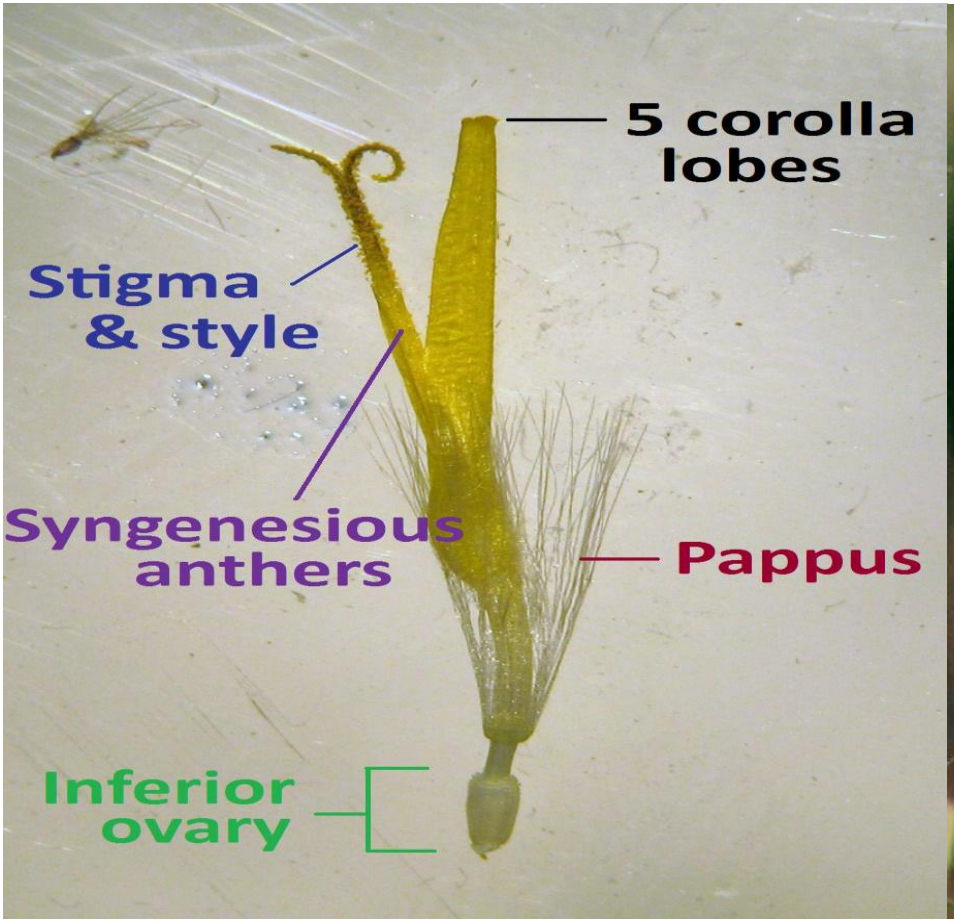
Floral Characters:

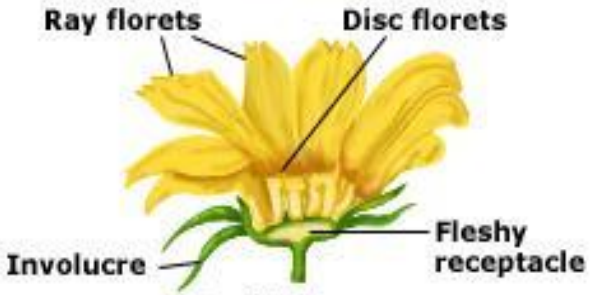
Inflorescence: **Capitulum** surrounded at the bases by a group of **involucres.** The receptacle is flat. The flowers in the receptacles are florets. There are two types of florets:

Homogamous: **In** this case, all flowers are of same kind.

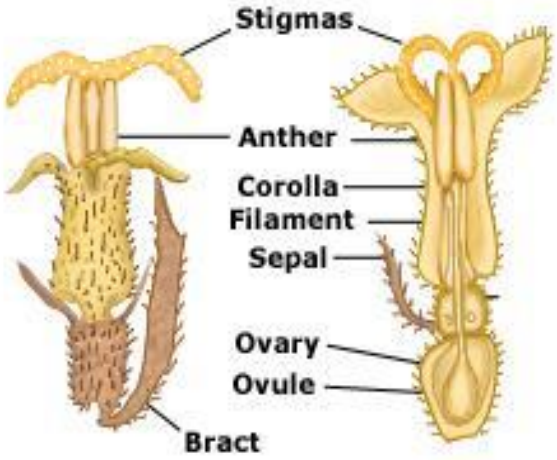
Heterogamous: In this case, three types of flowers are present in the capitula. Example: Sunflower. Sunflower has two types of small flowers, **disc florets** and **ray florets.** The disc florets are present in the central region. They are tubular and bisexual. The ray florets are present towards the periphery. They are pistillate or neuter.

LIGULATE , flowers are of the strap-shaped strongly zygomorphic variety. In these instances, all of these flowers are perfect (bisexual, hermaphroditic), unlike the ray flowers of most radiate capitula, which are neuter. Plants with ligulate capitula belong to a separate subfamily of the Asteraceae, also characterized by having milky sap. Chickory is an example:





L.S. of inflorescence



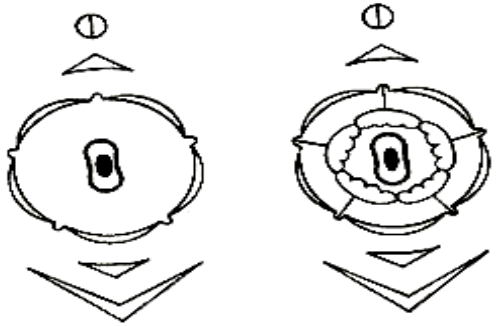
Disc floret

L.S. of disc floret

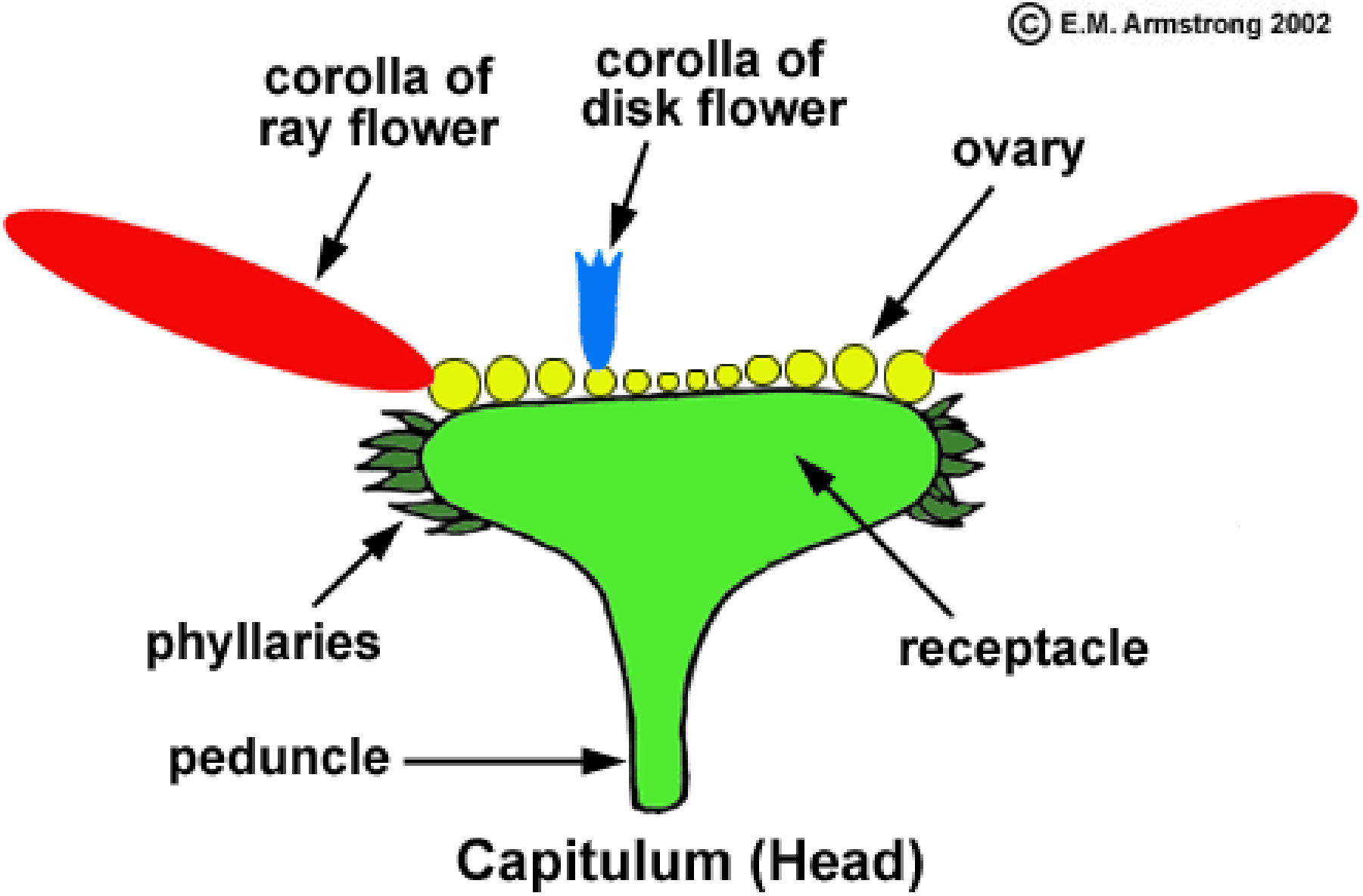
Floral Formula:

Ray florets: †, *Neuter*, K_{pappus}, $C_{(5)}$, A_0, G_0

Disc florets: ⊕, ☿, K_{pappus}, $C_{(5)}$, $A_{(5)}$ $G_{(2)}$



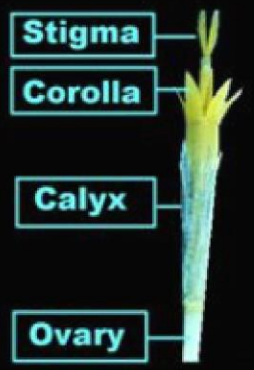
Floral diagram of Ray floret and disc floret



Capitulum: Inflorescence Of The Sunflower Family

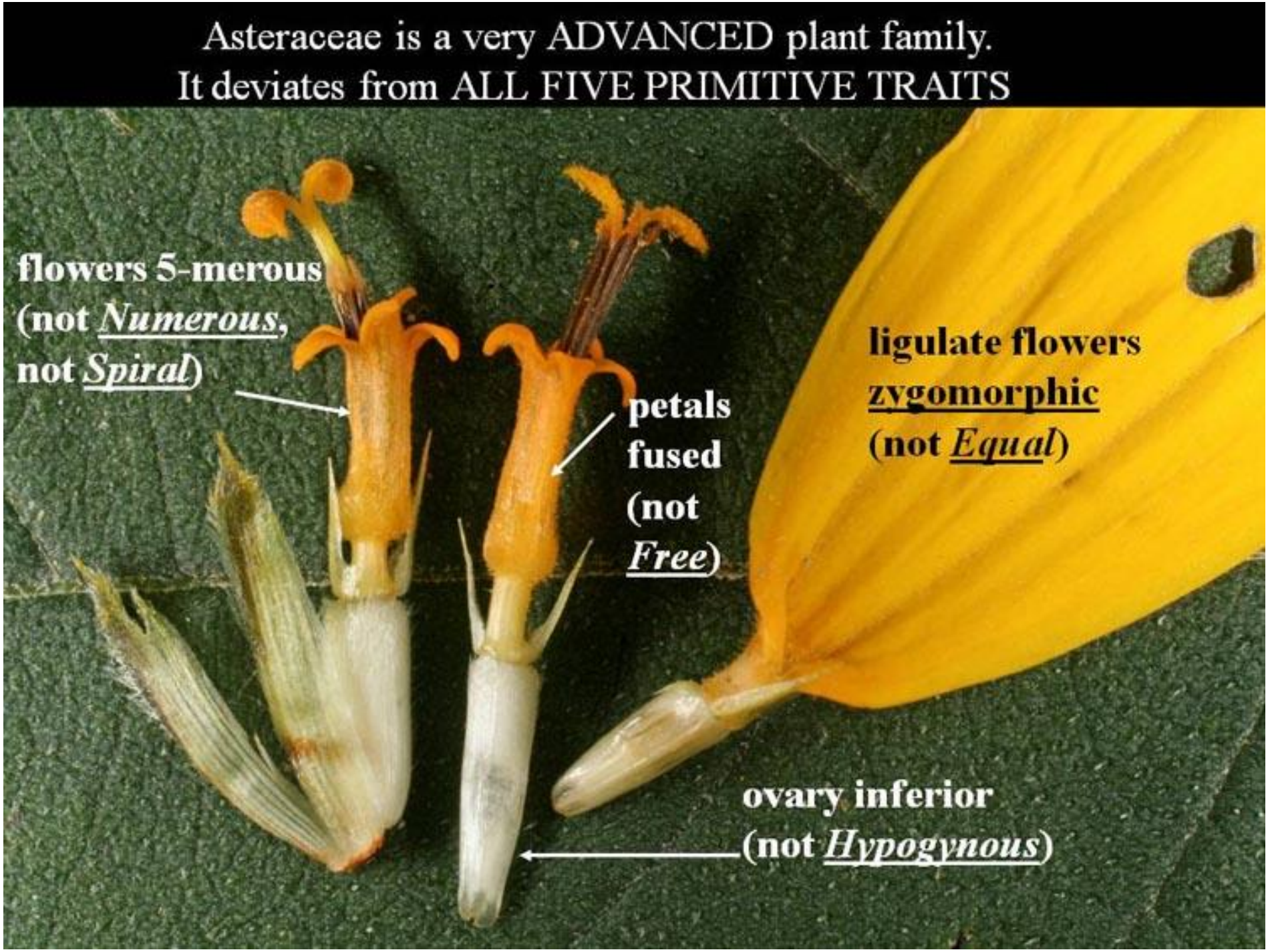
Florets (flowers) of three general types:

- **Disc florets** – these are actinomorphic, often perfect



- **Ray florets** – these are zygomorphic, often pistillate or sterile

- **Ligulate florets** – these are zygomorphic, usually perfect


Asteraceae is a very ADVANCED plant family.
It deviates from ALL FIVE PRIMITIVE TRAITS
flowers 5-merous
(not Numerous,
not Spiral)
petals
fused
(not
Free)
ligulate flowers
zygomorphic
(not Equal)
ovary inferior
(not Hypogynous)

Involucre of bracts subtending each head, called phyllaries

Flower: Sessile; ebracteate: actinomorphic or zygomorphic: pentamerous regular or irregular; complete or incomplete; unisexual or hermaphrodite; epigynous.

Perianth: with distinct calyx and corolla; 3–35; 1 whorled, or 2 whorled.

Calyx: Absent or hairy pappus, or scaly persistent.

Corolla: Gamopetalous; tubular 5-lobed, actinomorphic (in disc-florets) or zygomorphic or ligulate (in ray and ligulate florets).

Androecium: 5 stamens, united by their anthers forming a tube around the style.

Gynoecium: Bicarpellary, syncarpous, unilocular, one ovule, the locule, basal placentation, style narrow, stigma branched, ovary inferior.

Fruit: achenes or cypsela (=achene with attached calyx)

Geography, cytology. Frigid zone, temperate, sub-tropical, and tropical. Cosmopolitan. X = 2–19(+). Basic chromosome number of family 9.

Common Plants

Lactuca sativa الخس

Cynara scolymus الخرشوف

Cotula cinerea الكوتيولا

Gnaphalium luteo-album صابونة العفريت

Ambrosia maritima

Sonchus oleraceus الجعضيض

Senecio vulgaris شيخة شائعة

Centaurea alexandrina قنطريون

Conyza dioscoridis كونيزة

Launaea nudicaulis اليعضيض


© W.P. Armstrong 2006

Economic Importance

- food products: sunflower seeds, oil, lettuce
- species from 200 genera used as ornamentals
- medicinal uses: chamomile, wormwood, colt's foot (حشيشة السعال)
- many different weeds

Ray florets

Br % ♀ K_{2-3} Scales $C_{(3-5)}$ A_0 $\overline{G}_{(2)}$

Disc florets

Br ⊕ ♀♂ K_2 Scales $C_{(5)}$ $A_{(5)}$ $\overline{G}_{(2)}$

Neutral florets

Br % N $K_{(2-3)}$ Scales $C_{(3-5)}$ A_0 $\overline{G}_0$