

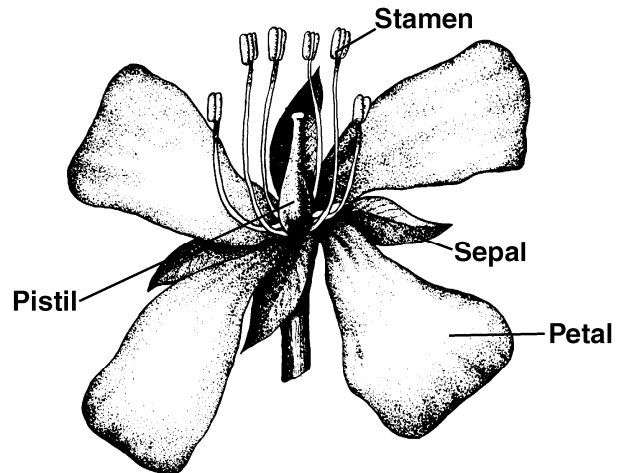
FLORAL PHYTOGRAPHY

What is a flower? A flower is the reproductive organ of the phylum Anthophyta (angiosperms). More specifically, a flower is a determinate shoot axis bearing highly modified leaves in spiral or whorls that originate from a reproductive meristem. These highly modified leaves bear the microsporangia and megasporangia. Characters to be observed when encountering flowers are given in the following paragraphs along with major descriptors for each character. This handout is meant as a resource for each individual to become acquainted with the general organization of the flower and the terms used to describe its features.

Floral Organs

Organ	Collective Term
Sepal	Calyx (Calyces)
Petals	Corolla
Stamens	Androecium
Pistils	Gynoecium

Receptacle: Terminal portion of stem axis



Perianth – Collective term for sepals and petals

In 2 series (biseriate): sepals and petals readily distinguishable; different in size and/or shape and/or color

In 1 series (uniseriate): sepals and petals similar, not readily distinguishable; or one whorl absent

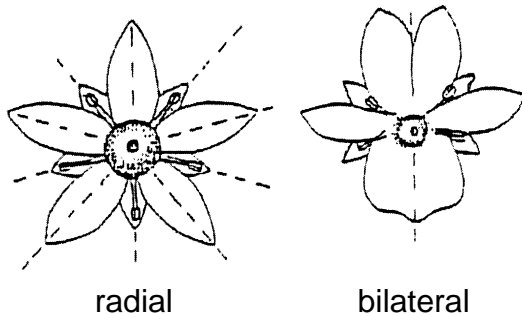
Corolla Symmetry: appearance of corolla due to size, shape, and position of petals on receptacle.

Determine number of planes giving mirror images

Radial (regular, actinomorphic): mirror images in 2 or more planes

Bilateral (irregular, zygomorphic): mirror images in only 1 plane

Asymmetrical: not divisible into mirror image in any plane



Numerical Plan

- 3-merous: floral organs in threes or multiples of three
- 4-merous: floral organs in fours or multiples of fours
- 5-merous: floral organs in fives or multiples of fives

Essential Floral Organs: sites of sporogenesis and gametogenesis, sexual reproduction

Stamens: microsporophyll (produces pollen); male reproductive organ

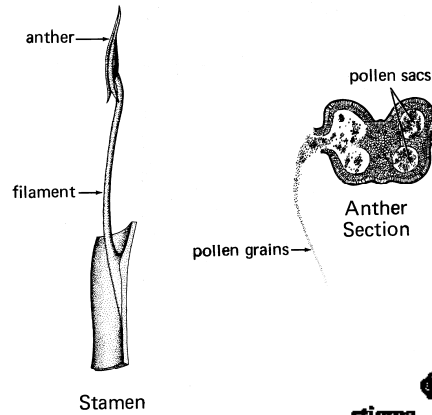
Pistils: megasporophyll (produces ovules); female reproductive organ

Stamen

Filament & Anther

- 2 or 4-lobed
- 2 or 4-loculed

Staminodium: sterile stamen; anther is rudimentary or absent



Pistil – innermost, differential floral organ

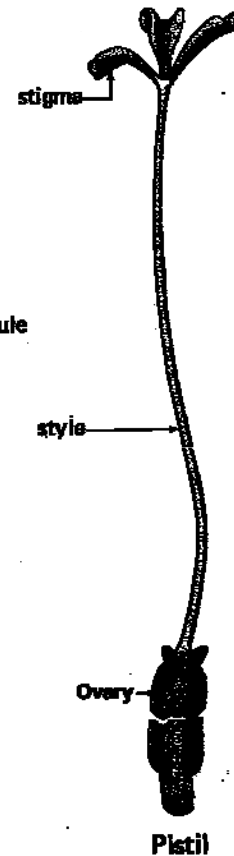
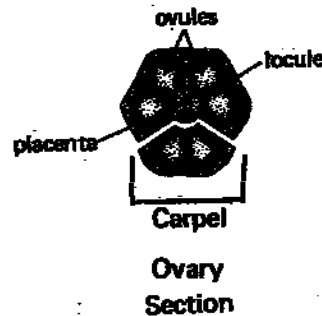
Comprises

- Ovary: enlarged basal portion with ovules
- Style: stalk connecting ovary and stigma
- Stigma: pollen receptive area

Flower may have 1 or more of each part

Flower may have 1 or more pistils

Comprises 1 or more carpels



Terms associated with pistils

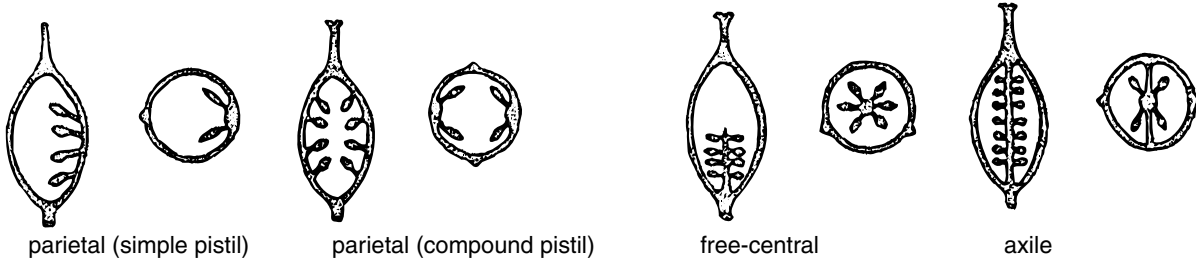
- Ovule (-s): female gametophyte with egg cell; becomes the seed
- Placenta (-ae): portion of ovary/carpel bearing ovules
- Locule (-s): open chamber or cavity within ovary/carpel
- Septum (-a): partition separating locules of ovary (may or may not be present)
- Carpel (-s) = single series of placenta + locule + septum (if present)

Placentation – arrangement of placentae within ovary

Parietal: placentae on ovary wall

Axile: placentae at ovary center and separated by septa

Free-central: placentae at ovary center and not separated by septa



Distinguishing between Simple & Compound Pistils

Simple: consists of 1 carpel

Compound: consists of 2 or more carpels

Count number of

- stigmas
- stigma lobes
- styles
- ovary lobes
- locules
- septa
- sets of placentae
- pistils per flower

Determine placentation

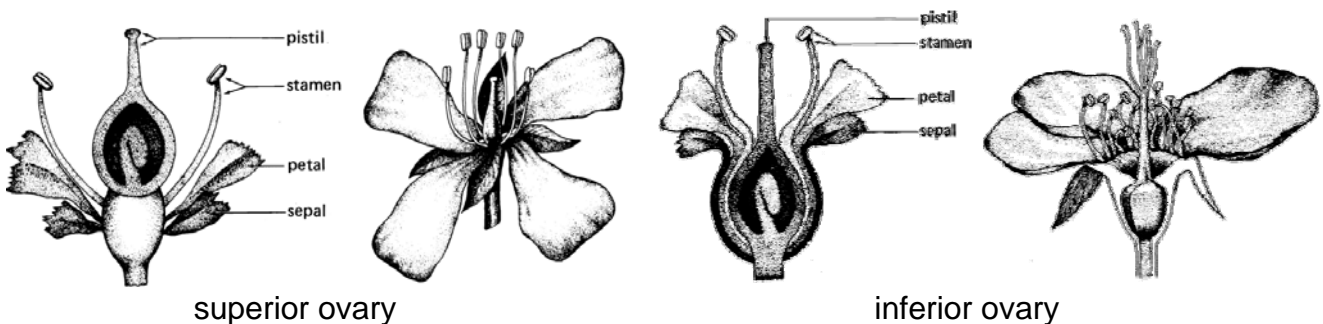
Simple pistil has 1 stigma, 1 style, 1 locule, 1 set of placentae, unlobed ovary, and parietal placentation

Compound pistil has 1 or more stigmas, styles, and/or locules; 2 or more sets of placentae and ovary lobes; and parietal, axile, or free-central placentation.

Ovary Position – Spatial relationship of ovary to other floral organs

Superior: sepals, petals, and stamens attached below ovary

Inferior: sepals, petals, and stamens attached above ovary



Presence or Absence of Floral Organs

Complete Flower: all four floral organs present

Incomplete Flower: one or more floral organs absent

Perfect Flower: both stamens and pistils present

Imperfect Flower: stamens or pistils or both absent

staminate: stamens present, pistils absent

pistillate: stamens absent, pistils present

neuter: both stamens and pistils absent

monoecious: plants bearing both staminate and pistillate flowers

dioecious: staminate and pistillate flowers on separate plants

Polygamous: plants with both perfect and imperfect flowers

Fusion of Floral Organs

Cohesion (coalescence) – fusion among organs of same whorl

Adhesion (adnation) – fusion among organs of different whorls

Presence of fusion

words: fused, united, connate, adnate

prefixes: gamo-, sym-, syn-

Absence or lack of fusion

words: free, separate, distinct

prefixes: poly-, apo-

Inflorescence – Arrangement of flowers on a floral axis; term is applied to solitary or multiple flowers.

Terms associated with inflorescences:

Peduncle: stalk supporting entire inflorescence

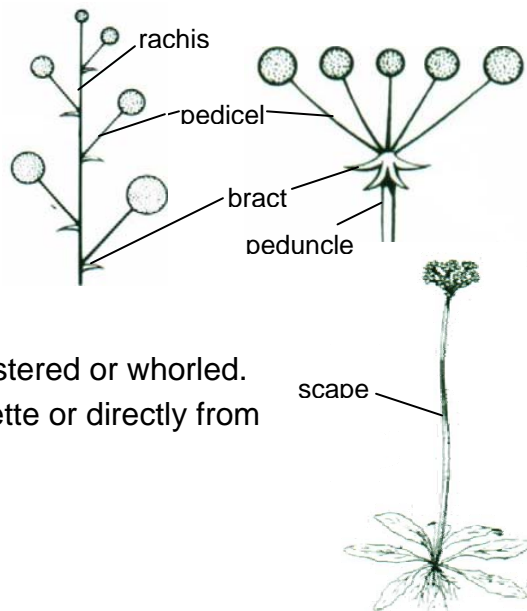
Pedicel: stalk supporting individual flower

Rachis: elongated axis of compound inflorescence

Bract: modified leaf associated with flower(s)

Involucre: collective term for bracts, typically clustered or whorled.

Scape: leafless peduncle arising from basal rosette or directly from ground



Inflorescence Types

Determinate: flower terminates stem axis thus no further elongation; oldest at apices

Indeterminate: flowers axillary; continued elongation of stem axis; oldest at base

Determinate Types

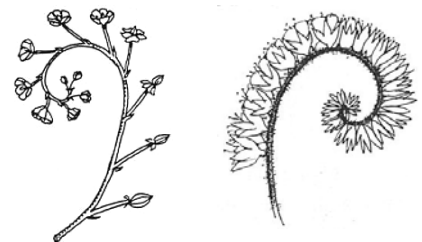
Solitary: single flower terminates stem; stem does not elongate further



Cyme: simple or compound; axillary flowers develop after terminal one

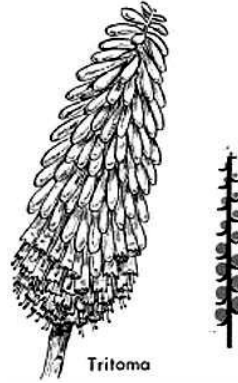


Helicoid/Scorpioid Cyme: lateral buds on side of rachis suppressed; coiled or curved; exhibited by some members of the Waterleaf Family (Hydrophyllaceae) and the Borage Family (Boraginaceae)

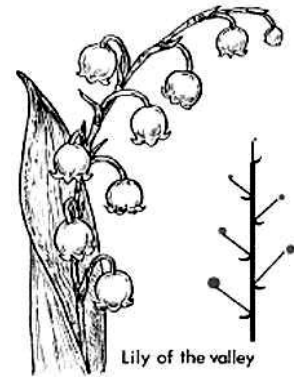


Indeterminate Types

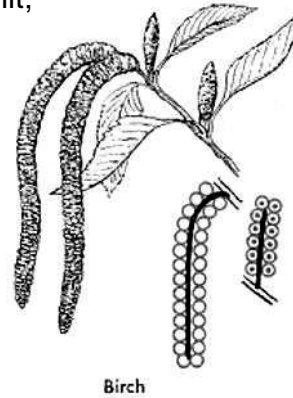
Spike: flowers borne directly on rachis; pedicels absent (sessile)



Raceme: flowers borne on pedicels arising from rachis



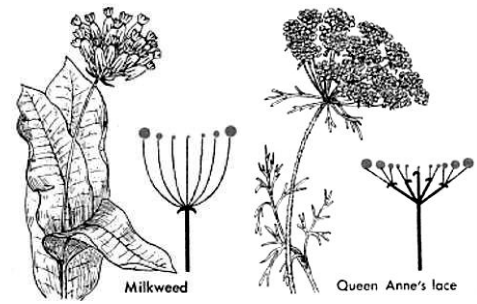
Catkin (Ament): flowers unisexual and apetalous; inflorescence deciduous as a unit; flowers sessile or pedicelled



Panicle: flowers borne on pedicels arising from branches arising from rachis; multibranched; youngest flowers near branch apices



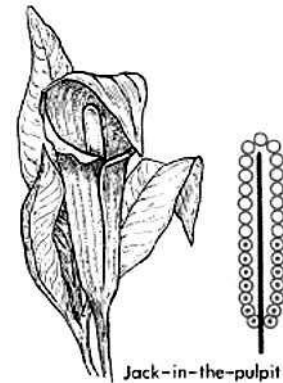
Umbel: simple or compound; pedicels arise from one point; appearance flat-topped or hemispheric; characteristic of members of the Dill Family (Apiaceae) and some members of the Milkweed Family (Asclepiadaceae)



Head: flowers born on a common receptacle and subtended by bracts; characteristic of members of the Sunflower Family (Asteraceae)



Spadix: fleshy spike subtended by a bract; typical of Arum Family (Araceae)



Spikelet: highly condensed inflorescence comprising flowers and subtending bracts borne on short axis; characteristic of the Grass Family (Poaceae) and the Sedge Family (Cyperaceae)

