

Flower Morphology and Related Concepts

The flower as a modified shoot;
Aestivation; Placentation and its
evolution; Floral formulae, Floral
diagram; Adhesion and cohesion of
floral parts

The Flower as a Modified Shoot

- • Flowers are modified shoots specialized for reproduction.
- • Floral organs (sepals, petals, stamens, carpels) are homologous to leaves.
- • Ensure protection of reproductive organs and aid pollination.
- • Origin explained by the 'Floral Theory' of Goethe.

Aestivation

- Arrangement of sepals or petals in a flower bud before it opens:
- 1. Valvate: Margins just touch (e.g., Calotropis).
- 2. Twisted: One margin overlaps the next (e.g., Hibiscus).
- 3. Imbricate: Irregular overlapping (e.g., Cassia).
- 4. Vexillary: Standard overlaps wings, wings overlap keel (e.g., Pea).

Placentation and Its Evolution

- Arrangement of ovules within the ovary:
 - 1. Marginal (primitive type).
 - 2. Axile (common in multicarpellary syncarpous ovaries).
 - 3. Parietal.
 - 4. Free-central.
 - 5. Basal and Apical.
- Evolution: Transition from simple marginal types to complex arrangements to optimize ovule number and seed dispersal

Floral Formulae

- Symbolic representation of flower structure.
- Shows number, arrangement, and fusion of floral organs.
- Example: Brassicaceae: $\text{♀} \oplus K(4) C_4 A_{2+4} G(2)$
- K = calyx, C = corolla, A = androecium, G = gynoecium.

Floral Diagram

- • Graphical representation showing number, arrangement, and fusion of floral parts in transverse section.
- • Depicts position of bracts, sepals, petals, stamens, carpels.
- • Useful in plant taxonomy.

Adhesion and Cohesion of Floral Parts

- • Cohesion: Fusion of similar floral parts (e.g., petals fused into a gamopetalous corolla).
- • Adhesion: Fusion of dissimilar floral parts (e.g., stamens attached to petals = epipetalous).
- • Fusion can enhance structural strength, pollination efficiency, and reproductive success.

Summary

- • Flowers are specialized shoots with modified leaves for reproduction.
- • Aestivation describes arrangement of petals/sepals in buds.
- • Placentation evolved for optimal ovule arrangement.
- • Floral formulae and diagrams are key tools in taxonomy.
- • Adhesion and cohesion shape floral morphology.