TOPIC: MORPHOLOGY OF FLOWERING PLANTS-FLOWER

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AUTHOR: DR.NIRMAL KUMARI

THE FLOWER

- The flower is the reproductive unit in the angiosperms. It is meant for sexual reproduction.
- A typical flower has four different kinds of whorls arranged successively on the swollen end of the stalk or pedicel, called **thalamus** or receptacle.

  These are calyx, corolla, androecium and gynoecium.

  Calyx and corolla are accessory organs, while androecium and gynoecium are reproductive organs.

- **Perianth :** In some flowers like lily, the calyx and corolla are not distinct and are termed as perianth.

Parts of a Flower

Each flower normally has four floral whorls, viz., calyx, corolla, androecium and gynoecium.

1. **Calyx (Sepals) –**

- The calyx may be gamosepalous (sepals united) or polysepalous (sepals free).
- Generally, sepals are green, leaf like and protect the flower in the bud stage.
- outermost whorl of the flower.

2. COROLLA (PETALS) –

- Petals are usually brightly coloured to attract insects for pollination.
- corolla may be also free (gamopetalous) or united (polypetalous).
- The shape and colour of corolla vary greatly in plants. Corolla may be tubular, bell-shaped, funnel-shaped or wheel-shaped.
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3. **Androecium (Stamens) –**

- Represents the male reproductive organ.
- Each stamen consists of a stalk or a filament and an anther.
- Each anther is usually bilobed and each lobe has two chambers, the pollen-sacs.
- The pollen grains are produced in pollen-sacs.
- A sterile stamen is called **staminode.**
- When stamens are attached to the petals, they are called **epipetalous**. e.g., brinjal.

- When stamens are attached to the perianth, they are called **epiphyllous**. e.g., lily.
- Fusion of stamen –
  - If the stamens in a flower remain free – Polyandrous.
  - If the stamens are united into one bundle – **monoadelphous**. e.g., china rose.
  - If the stamens are united into two bundles – **diadelphous**. e.g., pea.
  - If the stamens are united into more than two bundles – **Polyadelphous**. e.g., citrus.
- There may be a variation in the length of filaments within a flower, as in Salvia and mustard.

4. **Gynoecium (Carpels/Pistils) –**

- Gynoecium is the female reproductive part of the flower.
- A carpel consists of three parts – stigma, style and ovary.
  - **Ovary** is the enlarged basal part, on which lies the elongated tube, the style.
  - The **style** connects the ovary to the stigma.
  - The **stigma** is usually at the tip of the style and is the receptive surface for pollen grains.

- Each ovary bears one or more ovules attached to a flattened, cushion-like **placenta**.
- **Types of gynoecium –**
  - **Monocarpellary** – when only one carpel is present.
  - **Multicarpellary** – When more than one carpel is present.
  - **Apocarpous** – if carpels are free. e.g., lotus and rose.
  - **Syncarpous** – when carpels are fused. e.g., mustard and tomato.
- After fertilisation, the ovules develop into seeds and the ovary matures into a fruit.

Aestivation

The mode of arrangement of sepals or petals in floral bud with respect to the other members of the same whorl is known as aestivation.

1. **Valvate –** When sepals or petals in a whorl just touch one another at the margin, without overlapping. e.g., Calotropis.
2. **Twisted –** If one margin of the appendage overlaps that of the next one and so on. e.g., china rose, lady's finger and cotton.

3. **Imbricate –** If the margins of sepals or petals overlap one another but not in any particular direction. e.g., Cassia and gulmohur.
4. **Vaxillary (papilionaceous) –** it's special type of aestivation. It has five petals, the largest (standard) overlaps the two lateral petals (wings) which in turn overlap the two smallest anterior petals (keel). e.g., Pea, Bean.

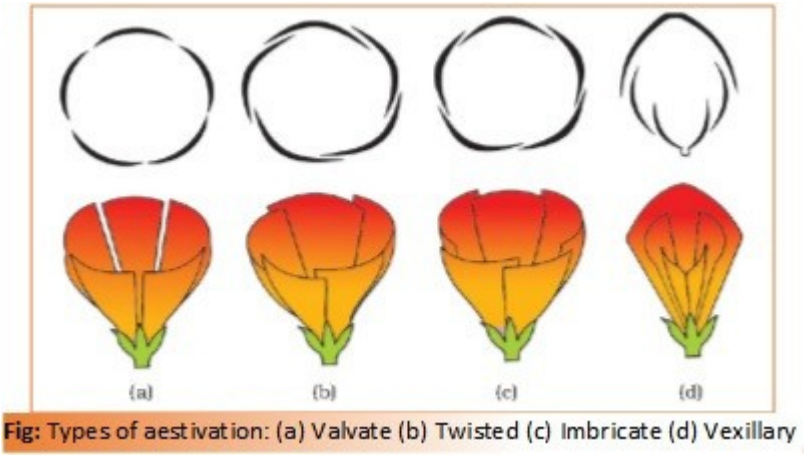

Fig: Types of aestivation: (a) Valvate (b) Twisted (c) Imbricate (d) Vexillary

Placentation

The arrangement of ovules within the ovary is known as placentation.

1. **Marginal –** The placenta forms a ridge along the ventral suture of the ovary and the ovules are borne on this ridge forming two rows. e.g., pea.
2. **Axile –** When the placenta is axial and the ovules are attached to it in a multilocular ovary. e.g., china rose, tomato and lemon.

3. **Parietal –** the ovules develop on the inner wall of the ovary or on peripheral part. Ovary is one-chambered but it becomes two chambered due to the formation of the false septum(Replum) e.g., mustard and Argemone.
4. **Basal –** the placenta develops at the base of ovary and a single ovule is attached to it. e.g., sunflower, marigold.
5. **Free Central –** When the ovules are borne on central axis and septa are absent. e.g., Dianthus, Primrose.

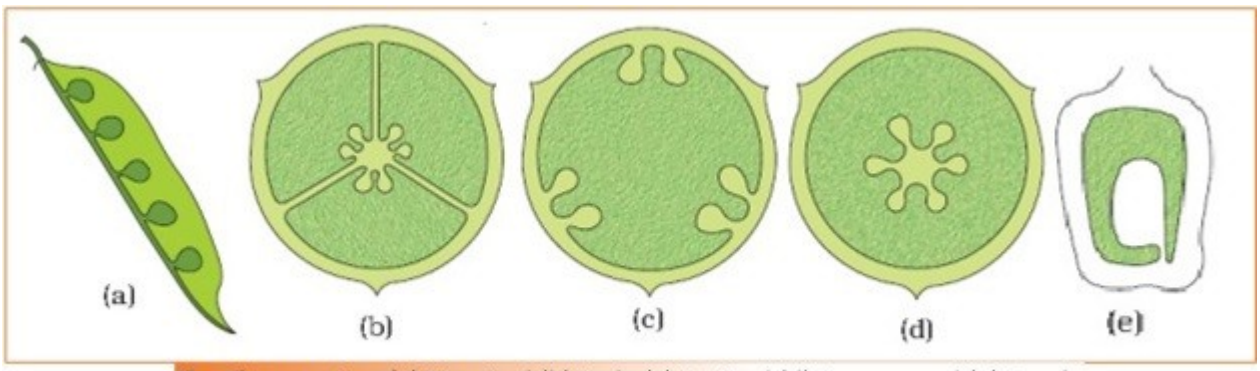

Fig: Placentation: (a) Marginal (b) Axile (c) Parietal (d) Free central (e) Basal