

Reproductive systems in plant .

OBJECTIVES

After completing this lesson, you will be able to

- define reproduction**
- describe the mode of reproduction in flowering plants**
- explain the parts of a dicot flower and their functions**
- differentiate between vegetative, asexual and sexual reproduction**

Plant Propagation –is the technique of making two or more plants where previously there was one. By using various methods we can produce exact replicas that perpetuate much loved varieties or we can create entire new plants that may become favorites of the future.

Describe the functions of each part of the flower

- FLOWER:** Flowers are the site of sexual reproduction in flowering plants.
- A typical angiospermic flower has following parts arranged in four whorls. They are Calyx, Corolla, Androecium and Gynoecium**

1. Calyx: It is the outer most whorl of the flower. It is composed of leaf like green sepals.

2. Corolla: It is the second whorl of flower and consists of number of petals.

3. Androecium: It is the third whorl of flower consisting of stamens. Stamen is the male reproductive organ of flower. Each stamen is made up of filament and anther.

4 .Gynoecium: This is the last and fourth whorl of the flower consisting of pistil or carpel. Pistil is the female reproductive organ of the flower. Each pistil is composed of ovary, style and stigma

What Are the Parts of A Flower?

- **Flowers are the most obvious part of a plant**
- **They are made of many important parts**

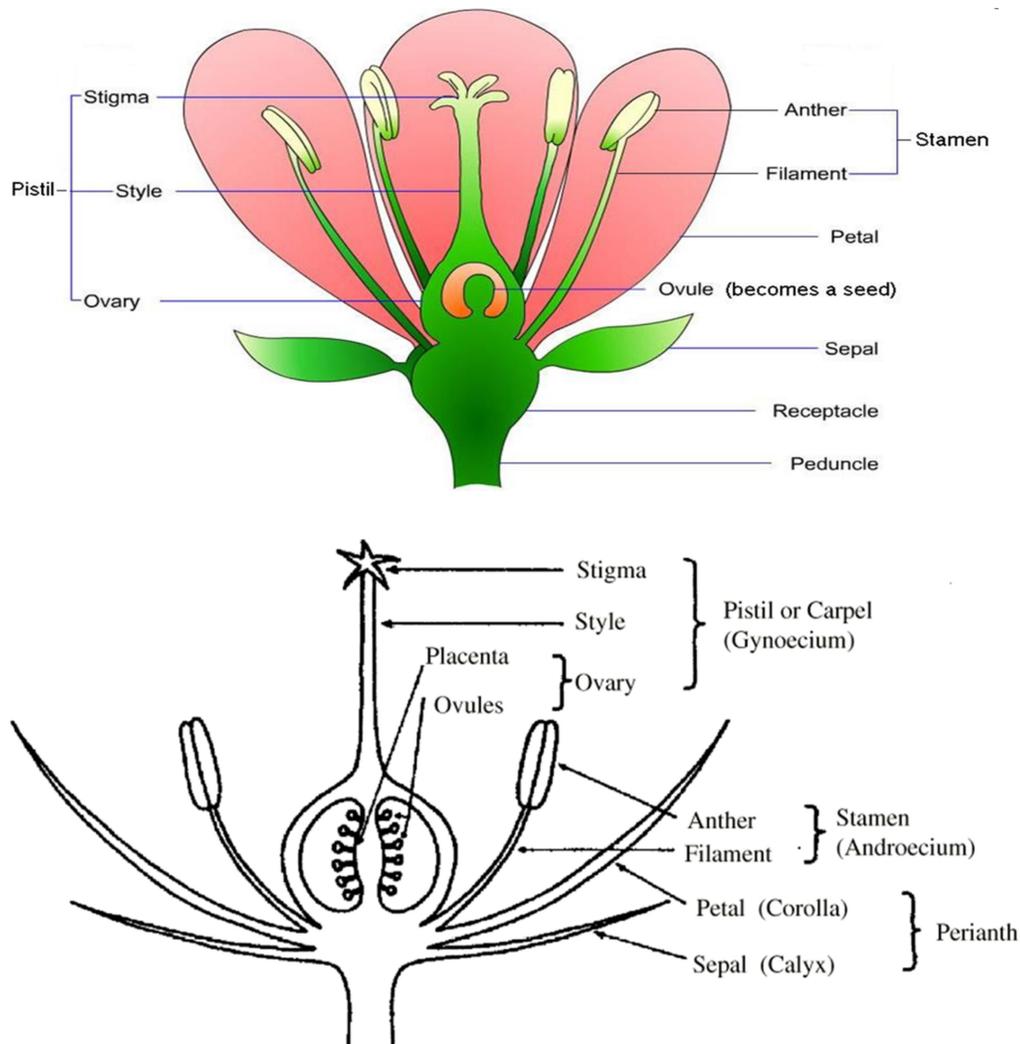


Most flowers have four parts:

sepals, petals, stamens,carpels,pistills

- **Sepals protect the bud until it opens.**
- **Petals attract insects.**
- **Stamens make pollen.**
- **Pistils (carpel) grow into fruits which contain the seeds**

The Reproductive Parts



Stamens

Stamen, Microsporangium

Figure 2.2a shows the two parts of a typical stamen – the long and slender stalk called the filament, and the terminal generally bilobed structure called the anther. The proximal end of the filament is attached to the thalamus or the petal of the flower. The number and length of stamens are variable in flowers of different species. If you were to collect a stamen each from ten flowers (each from different species) and arrange them on a slide, you would

be able to appreciate the large variation in size seen in nature. Careful observation of each stamen under a dissecting microscope and making neat diagrams would elucidate the range in shape and attachment of anthers in different flowers.

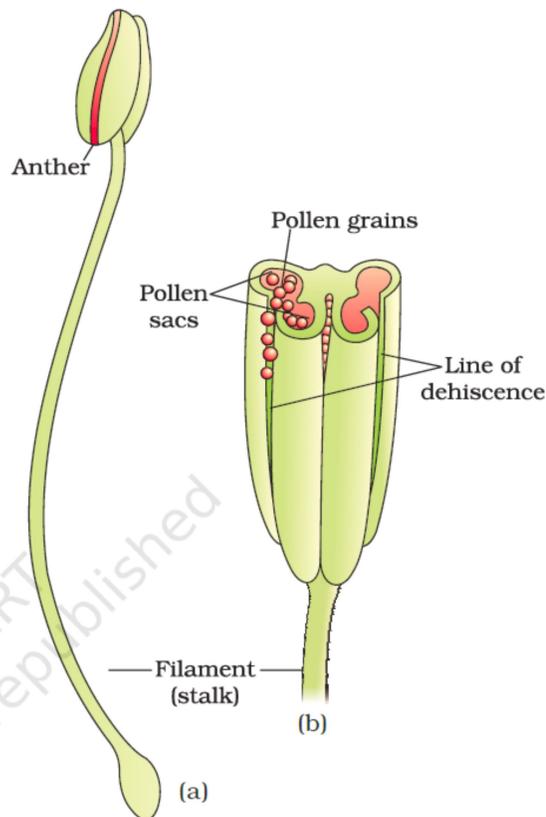


Figure 2.2 (a) A typical stamen;
(b) three-dimensional cut section
of an anther

A typical angiosperm anther is bilobed with each lobe having two theca, i.e., they are dithecous (Figure 2.2 b). Often a longitudinal groove runs lengthwise separating the theca. Let us understand the various types of tissues and their organisation in the transverse section of an anther

(Figure 2.3 a). The bilobed nature of an anther is very distinct in the transverse section of the anther. The anther is a four-sided (tetragonal) structure consisting of four microsporangia located at the corners, two in each lobe.

The microsporangia develop further and become pollen sacs. They extend longitudinally all through the length of an anther and are packed with pollen grains.

Structure of microsporangium: In a transverse section, a typical microsporangium appears near circular in outline. It is generally surrounded by four wall layers (Figure 2.3 b)– the epidermis, endothecium, middle layers and the tapetum. The outer three wall layers perform the function of protection and help in dehiscence of anther to release the pollen. The inner most wall layer is the tapetum. It nourishes the developing pollen grains. Cells of the tapetum possess dense cytoplasm and generally have more than one nucleus.

Microsporogenesis : As the anther develops, the cells of the sporogenous tissue undergo meiotic divisions to form microspore tetrads. What would be the ploidy of the cells of the tetrad?

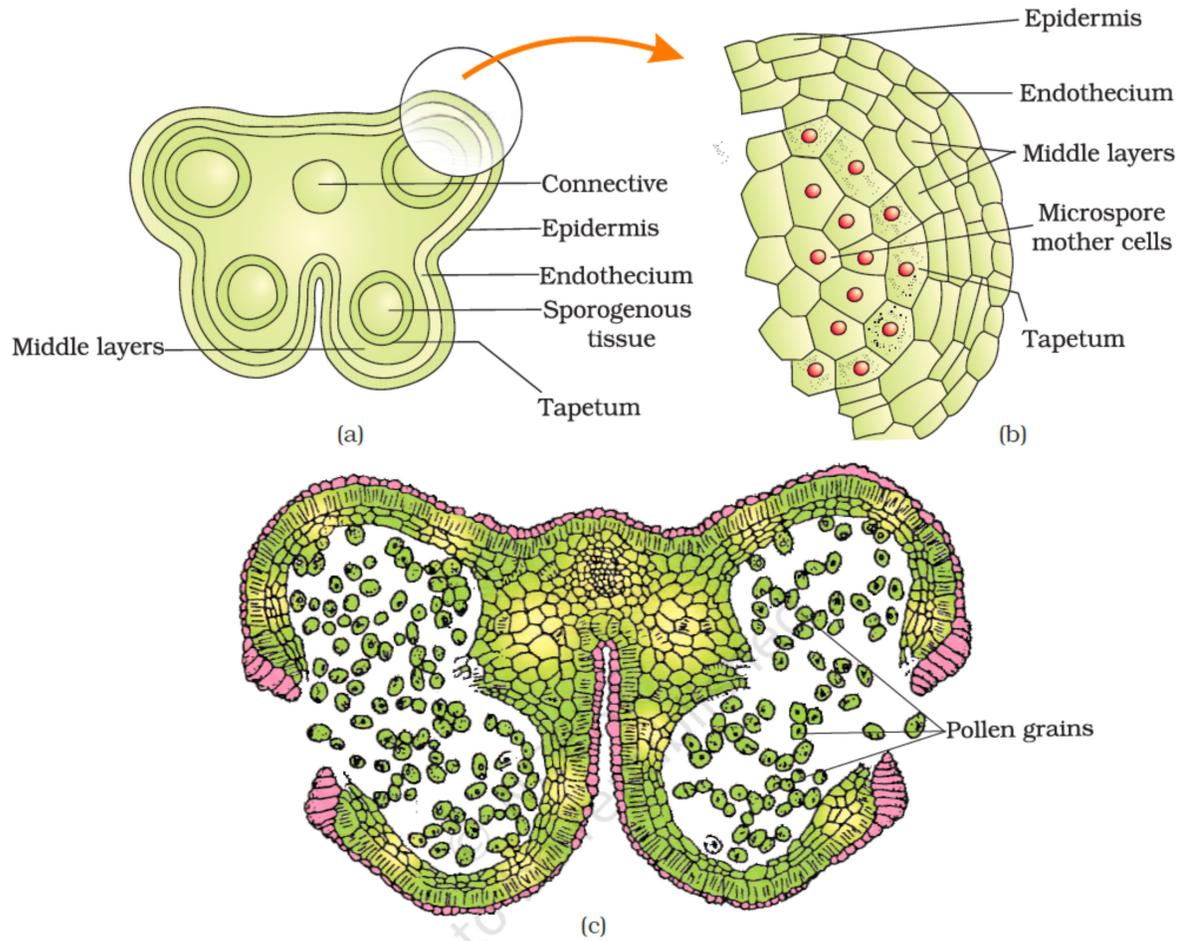


Figure 2.3 (a) Transverse section of a young anther; (b) Enlarged view of one microsporangium showing wall layers; (c) A mature dehiscing anther

Stamen: the plant's male organ, made up of two parts:

Anther	Bears pollen grains and the male gametes, or sperm.
Filament	Supports the anther.

- The stamens are the male part of the flower.
- The plant makes pollen in the part of the stamen called the anther



Stamens Continued

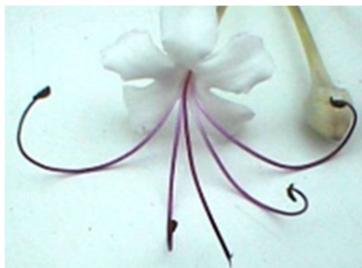


Anther

- Part of the stamen
- Produces and holds pollen



- Filament



- **Stalk that holds up the anther**

The Pistil, Megasporangium (ovule) and Embryo sac.

The gynoecium represents the female reproductive part of the flower. The gynoecium may consist of a single pistil (monocarpellary) or may have more than one pistil (multicarpellary). When there are more than one, the pistils may be fused together (syncarpous) (Figure 2.7b) or may be free (apocarpous) (Figure 2.7c). Each pistil has three parts (Figure 2.7a), the stigma, style and ovary. The stigma serves as a landing platform for pollen grains. The style is the elongated slender part beneath the stigma. The basal bulged part of the pistil is the ovary. Inside the ovary is the ovarian cavity (locule). The placenta is located inside the ovarian cavity.

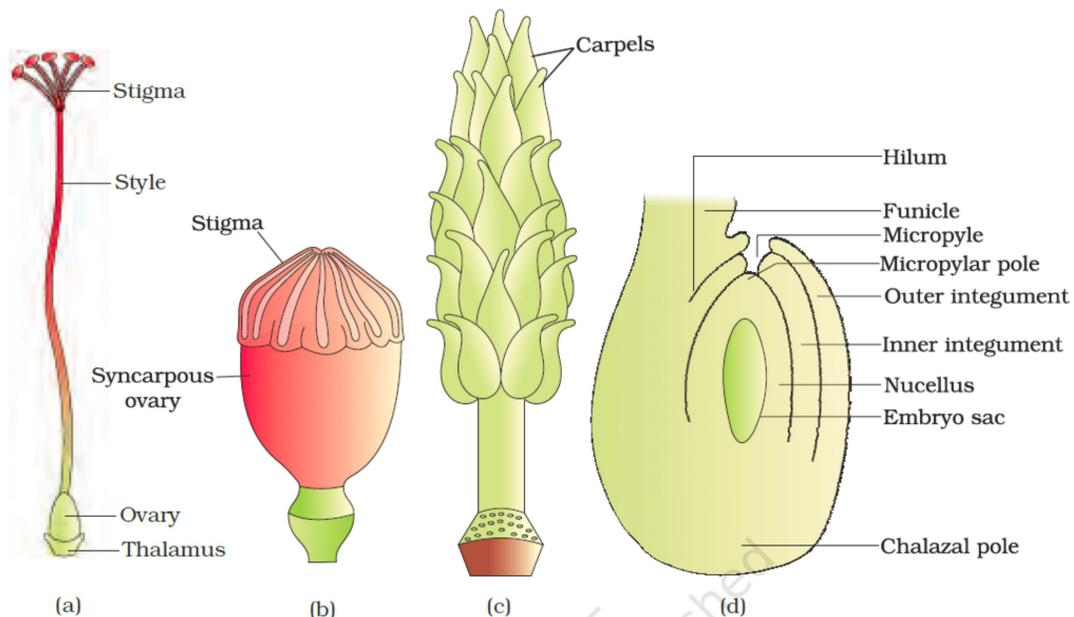


Figure 2.7 (a) A dissected flower of *Hibiscus* showing pistil (other floral parts have been removed); (b) Multicarpellary, syncarpous pistil of *Papaver*; (c) A multicarpellary, apocarpous gynoecium of *Michelia*; (d) A diagrammatic view of a typical anatropous ovule

The Stigma

- **The stigma is the top of the female part of the flower.**
- **Pollen from another flower collects on the stigma's sticky surface.**
- **Found at the end of the pistil**



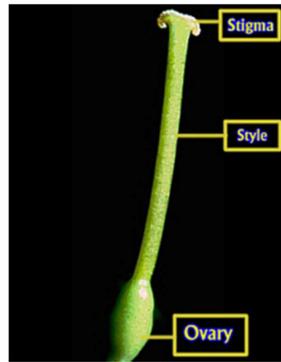
Pistil



- **The female part of the flower**

Style

- **The neck of the pistil**



The Ovary

- Part of the pistil that contains the ovules

The Ovary

- The ovary protects the ovules.
- Pollen travels to the ovules and fertilization takes place.
- Now the ovules will develop into seeds



Ovule

- The part of the flower in which the eggs are produced and seeds develop