

Quadrant II- Transcript and Related Materials

Programme	: S. Y. B. Sc.
Subject	: Botany
Course Code	: BOC 103
Course Title	: Plant Anatomy and Embryology
Unit	: 5- Structural Organization of Flower
Module Name	: Structure and Types of Ovules
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Notes:

Flower: Reproductive structure found in flowering plants. The function of a flower is to facilitate reproduction, usually by providing a mechanism for the union of sperm with eggs.

A typical flower has four main parts or whorls

1. **Sepals**- Calyx protects Flower in bud condition
 2. **Petals**- Corolla attracts pollinators
 3. **Stamens**- Male reproductive structure (Androecium)
 4. **Pistil** – Female reproductive structure (Gynoecium)
4. **Pistil:**
- It is the last and inner most whorl of flower
 - It is the female reproductive part of flower
 - All pistils or Carpels together make up the **Gynoecium**
 - Single Pistil (monocarpellary). May have more than one Pistil (multicarpellary)

- When there are more than one Pistils, may be fused together (Syncarpous) or may be free (Apocarpous)
- Each Pistil has three parts:
 1. **Stigma**: It is a landing place for pollen grain
 2. **Style**: Tube through which pollen tube reaches
 3. **Ovary**: contains ovule which turns into seed and ovary into fruits.

L.S. of Pistil

- Ovules
- Present inside locules (carpels) two locules so Bicarpalary
- Ovules are attached to a tissue in centre called **Placenta**

Structure of Ovule:

- Ovule is commonly called as **Megasporangia**
- The ovule is a small structure attached to the placenta by means of stalk called **Funiculus**
- The body of ovule fuses with funicle in the region called **Hilum**
- Each ovule has one or two protective envelopes called **Integuments**
- Integuments encircle the ovule except at the tip where small opening **Micropyle**
- Opposite to the Micropylar end, is the **Chalaza** representing the basal part of ovule
- Inside the ovule present parenchymatous tissue called **Nucellus**
- Inside the nucellus there is a **Embryo sac** female gametophyte

Types of Ovules: Relative position of Micropyle, Funicle and Chalaza they are divided into Six types

1. Orthotropous or atropous ovule (ortho-straight, tropous - turn)

- The body of the ovule is erect or straight. The hilum, chalaza and the micropyle lie in a straight line. Examples Piperaceae, Polygonaceae.

2. Anatropous ovule (ana - backward or up, tropous - turn)

The body of the ovule becomes completely inverted during the development so that the micropyle lies very close to the hilum. This type of ovule is common in all Angiosperms

3. Hemi-anatropous or hemitropous ovule

The body of the ovule is placed transversely at right angles to the funicle. The micropyle and chalaza lie in one straight line. This is observed in the family Ranunculaceae.

4. Campylotropous ovule (kampylos - curved)

The body of the ovule is curved or bent round so that the micropyle and chalaza do not lie in the same straight line. This type is common in the family Fabaceae.

5. Amphitropous ovule

The curvature of the ovule is very much pronounced and the embry sac also becomes curved (Horseshoe). Found in the families, Alismaceae, and Butomaceae.

6. Circinotropous ovule

The nucellus and the axis are in the same line in the beginning but due to rapid growth on one side, the ovule becomes anatropous. The curvature continues further and the micropyle again points upwards. Generally found in Opuntia and Plumbago.