Kinds of ovules

i) Orthotropous

Here micropyle, chalaza and funicle lie in one straight line. This is primitive and simplest. Polygoniaceae family. e.g. Polygonum.

ii) Anatropous

Here body of the ovule is completely inverted so that micropyle and hilum come to lie very close to each other. Degree of curvature is 180^0. Found in Asteraceae family and usually in Gamopetale members e.g. castor.

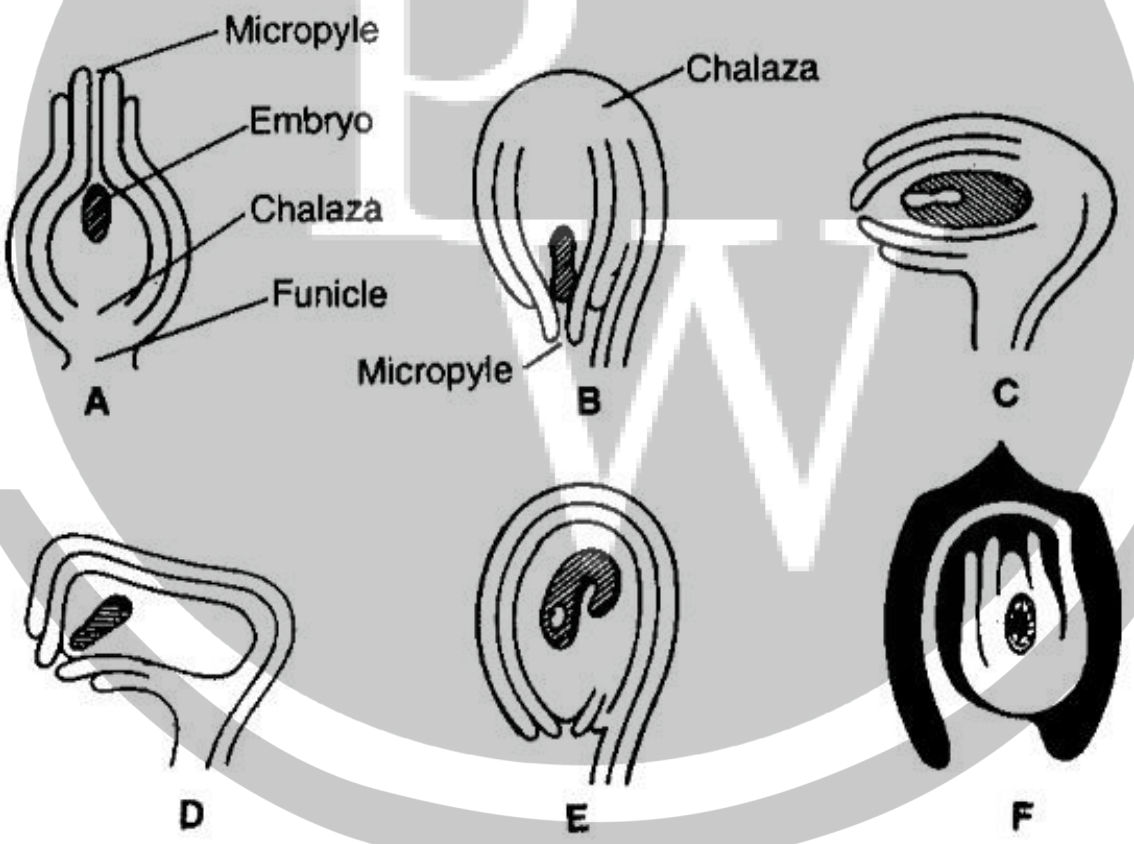

Fig 1. Different types of ovules A) Orthotropous; B) Anatropous; C) Hemitropous; D) Campylotropous; E) Amphitropous; F) Circinotropous

iii) Amphitropous

Embryosac becomes horse shoe shaped.

The micropyle is directed downwards and does not lie on straight line with chalaza. Degree of curvature is 160^0. e.g. Poppy (family Alismaceae) and Butamaceae.

iv) Campylotropus

Chalaza is present at right angle to funicle.

- Ovule is curved. Degree of curvature is between 90^0 and 160^0 ($> 90^0$ & $< 160^0$).
- Micropyle is directed towards funicle. e.g. Fabaceae, Chinopodiaceae, Brassicaceae.

v) Hemitropus or Hemianatropous

Nucellus and integuments are present at right angle to funicle. Degree of curvature is 90^0. e.g. *Ranunculus and Primula.*

vi) Circinotropous

Funicle completely surrounds the body of ovule. Rarely found. Degree of curvature is 360^0. *e.g. Opuntia (Cactaceae), Plumbago (Plumbaginaceae).*