

Vidya Bhawan Balika Vidyapeeth Lakhisarai

Arun Kumar Gupta

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Subject Biology

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Endosperm– the primary endosperm cell divides many time to forms triploid endosperm tissue having reserve food materials.

Two types of endosperm development :

- (i) Free nuclear type (common method)
- (ii) Cellular type

(a) Non-albuminous- endosperm completely utilized- before maturation of seeds. e.g pea, groundnut

(b) Albuminous- a portion of endosperm remain in mature seeds. e.g wheat, maize, castor

Embryo- Embryo develops at the micropylar end of the embryo sac where the zygote is located.

Embryogeny – early stages of embryo development. The zygote gives rise to the proembryo and subsequently to the globular, heart-shaped and mature embryo.

Embryo consists of:

- embryonal axis
- cotyledons
- plumule
- radicle

Monocotyledonous Seed

- Scutellum = Cotyledon
- Coleorrhiza: undifferentiated sheath covering radical & root cap
- Coleoptile: sheath covering plumule

Seed

- Fertilized and mature ovule develops into seed.

Seed consists of:

- cotyledon(s)
- embryonal axis
- Seed coat- double layered- formed by integuments

- **Testa** (outer coat)
 - **Tegmen** (inner coat)
- **Micropyle**:- small opening on seed coat, it facilitates entry of H₂O & O₂ into seeds (for germination)
 - **Hilum**:- scar on seed coat
 - **Seed** – Albuminous / Non-Albuminous
 - **Perisperm** : remnants of nucellus that is persistent. Ex: Black pepper
 - **Dormancy**: state of inactivity
 - The wall of ovary develops into wall of fruit called **pericarp**. In true fruits only ovary contributes in fruit formation by in false fruit thalamus also contributes in fruit formation.

Apomixis

- Form of asexual reproduction- mimics sexual reproduction- seed formed without fertilisation
- Formation of apomictic seeds :
 - diploid cell (formed without meiosis)- develop into embryo without fertilization
 - cells of nucellus (2n) surrounding embryo sac- protrude into embryo sac- develop into embryos. Ex. Citrus and Mango.

Polyembryony

- Occurrence of more than one embryo in a seed
- Often associated with apomixes. Ex: Citrus, groundnut