

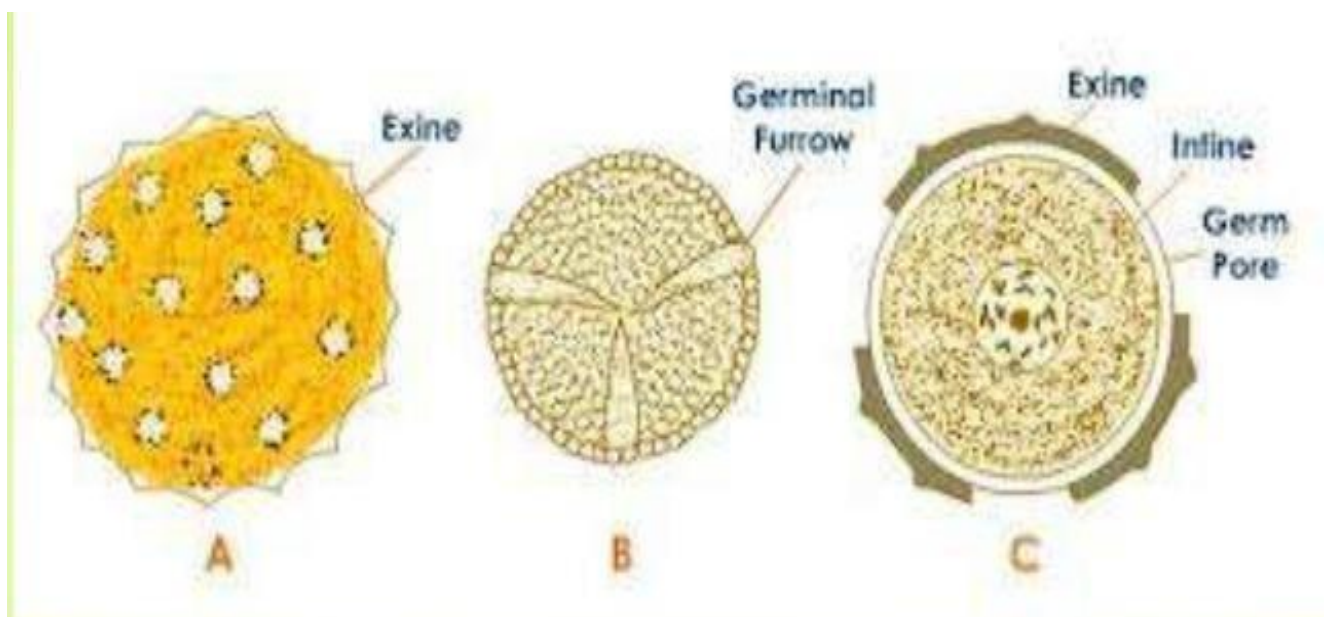
BIOLOGY STUDY MATERIALS FOR CLASS 12

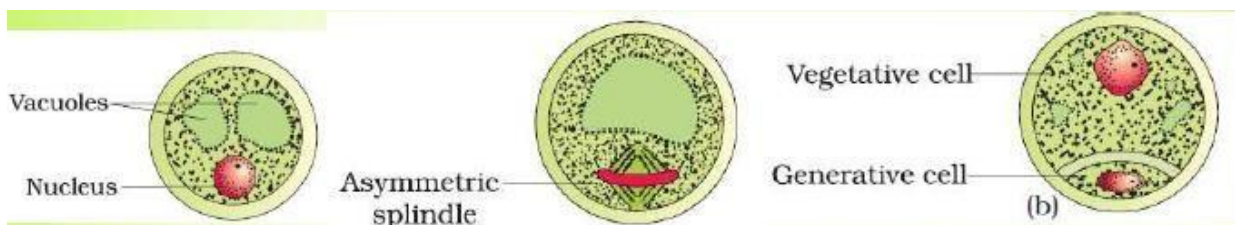
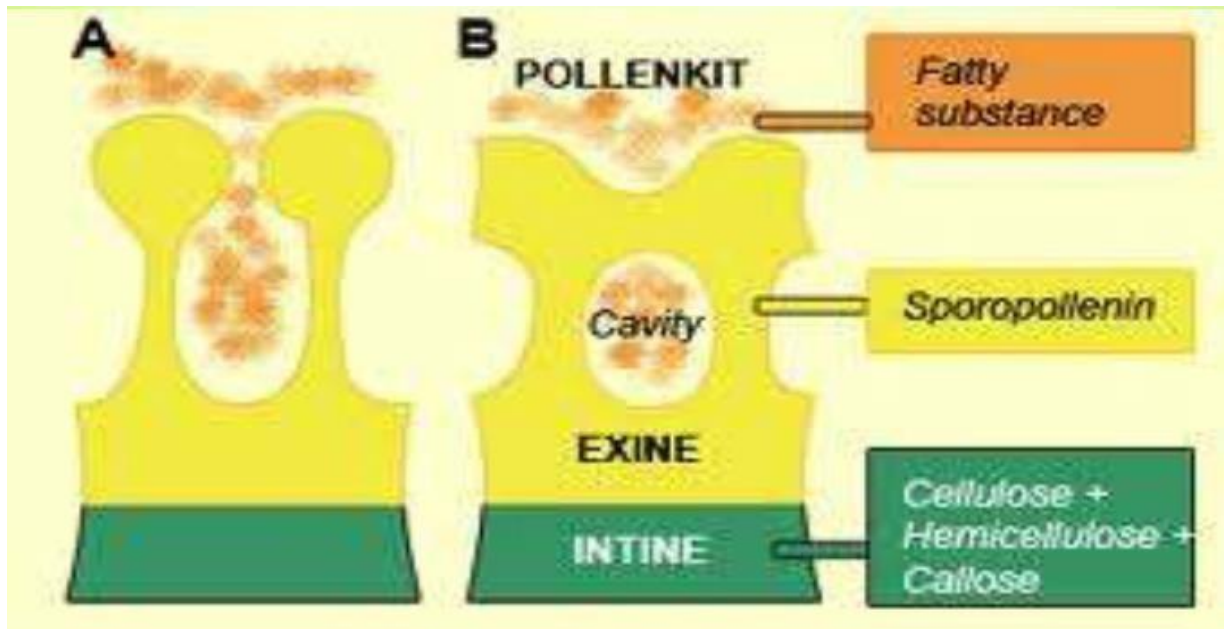
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POLLEN GRAIN

- Pollen grains vary in shapes.
- It is generally round with size of 25 – 30µm.
- Pollen grain is haploid, unicellular body with single nucleus. It has a two-layered wall.
- Wall or **sporoderm** consists of two layers.
- Outer layer is thick. It is called as the **exine**. It is made of sporopollenin.
- Inner wall is thin and is called as the **intine**. It is made up of pecto-cellulose.
- The exine is thick and sculptured or smooth. It is cuticularised and cutin is of special type called sporopollenin which is resistant to chemical and biological decomposition. This preserves the pollen wall for long periods. It also possess proteins for enzymatic and compatibility reactions.
- Exine is differentiated into **inner endexine and outer ektexine**. Ektexine is further divided into inner continuous foot layer, middle discontinuous baculate layer and outermost discontinuous tectum.
- **Tectum** aids in the identification of pollen grains and assigning them to their family, genus or species.
- Pollen grain contains regions of pores or furrows. In these regions exine is absent. When the areas are circular they are called as **germ pores**. When the areas are elongated they are called as **germ furrows**.
- Intine is thin and elastic. It is made up of cellulose and pectin. During pollen germination it is the intine that extends out to form the pollen tube.
- The cytoplasm of the pollen grains is rich in starch and unsaturated oils. They are initially uninucleate and later becomes 2-3 celled.
- In *Calotropis* and orchids, the pollen of each anther lobe formed a characteristics mass called pollinium.
- Pollen grains can be monoclopatate (having one germ pore), biclopatate (two germ pores) and triclopatate (3 germ pores).
- The branch of study of pollens is called **palynology**.





Development of male gametophyte

- The nucleus increases in size inside the pollen grain. It divides mitotically to produce two unequal daughter cells: A bigger vegetative cell or tube cell and smaller generative cell.
- Pollination can occur when the pollen grain is two celled (tube + generative) or three-celled (tube + two male gametes).
- However, in plants such as cereals, the male gametes form while the pollen is still within the anther.
- In those cases, where pollen is shed at two celled stage, the generative cell divides after pollen has landed on stigma.
- The cytoplasm of generative cell does not contain much of stored food material.
- Fat, starch and protein granules are present in the vegetative cell.

Pollen products

1. Pollen food supplements: Pollen grain contains abundant carbohydrates and unsaturated fat. They are used in the form of tablets and syrups for enhancing vital body functions. Pollen consumption increases performance and used by athletes and given to race horses.
2. Pollen creams: Pollen grain protect themselves from UV rays. Thus they are used in creams, emulsions for providing smoothness and protection to skin.

Pollen viability

- The period for which pollen grains remain viable or functional is called pollen viability.
- It depends upon temperature and humidity.
- Pollen grains remain viable for 30 minutes.
- Pollen grain can be cryopreserved in liquid nitrogen (temp – 196°C) and used as pollen banks.

Pollen allergy

- Pollen grain produce severe allergy. It causes have fever and common respiratory disorders as asthma, bronchitis.
- Carrot grass (*Parthenium hysterophorus*) is major source of pollen allergy. It also causes harm to internal body organs. It was introduced in India along with imported wheat.
