4. Study of pollen germination on slide.

Date : / /

Pollen groins ore the mole reproductive units produced in the anther lobe of stamens, producing pollen tube carrying male gametes, on germination.

Aim :- To study the process of pollen germination on slide while observing under the compound microscope.

Requirements :- Flower of *CatImranthus* (periwinkle) or *Helianthus* (Sunflower) or *Hibiscus* (shoe flower), cavity slide/ gloss slide, cover slips, compund microscope, sucrose crystals (Table sugar), etc.

Principle :-

Pollen grain after deposited over the stigma absorbs water and nutrients from the stigma and germinates to produce male gumetophyte showing pollen tube with two non-motile male gametes and a larger vegetative nucleus.

Figure :-

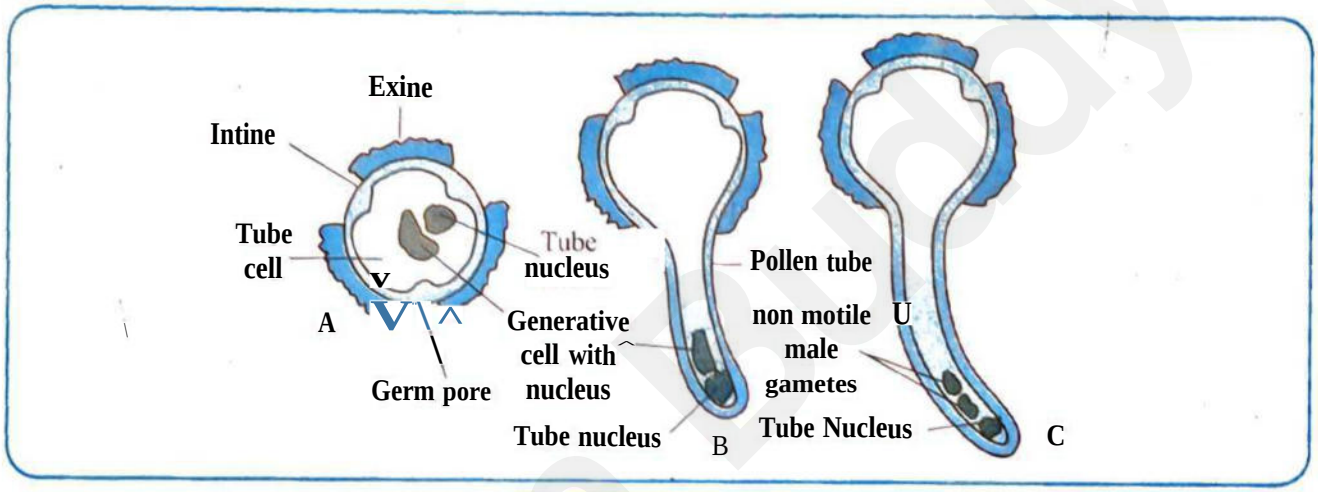


Fig. Pollen grain showing pollen germination

Procedure :-

1. A nutrient medium is to be prepared using 20grams of sucrose in 100 ml of water.
2. Take a few drops of this solution preferably on a cavity slide and dust a few pollen grains from mature, dehisced anther.
3. Place cover slip carefully.
4. Observe the slide under compound microscope after every five minutes continously for 30 minutes.

Observation :-

1. In the nutrient medium, the pollen will germinate and pollen tube comes out through germ pore.
2. It is due to enlargement of tube cell and stretching of the intine, pollen tube comes out and grows.

Inferences:-

The pollen grain is uninucleate (has one nucleus) in the beginning. At the time of liberation, it becomes 2 celled, with a small generative cell and a vegetative cell.

In the nutrient medium, the pollen grain germinates. The tube cell enlarges and comes out of the pollen grain through one of the germ pores to form a pollen tube. The tube nucleus descends to the tip of the pollen tube. The generative cell also passes into it. It soon divides into two male gametes.

Questions

1. Note the shape, colour **and ornamentation of pollen grain?**

Pollen grains of various species are round, ovale, disc or bean-shaped and som times filamentous. thread-shaped

The natural color is mostly white, cream, yellow or orange. The texture of the cell wall shows also great varietions, from smooth to spiky

2. What are the specific terms used for inner and outer walls of pollen grain?

The pollen grain has two walls, i.e. exine (outer wall) and inline (inner wall).

3. Name the chemical component of the inner wall of pollen grain?

Intine is chiefly composed of peat cellulose

4.What does a mature pollen grain represent?

The pollen grain represents a male gametophyte

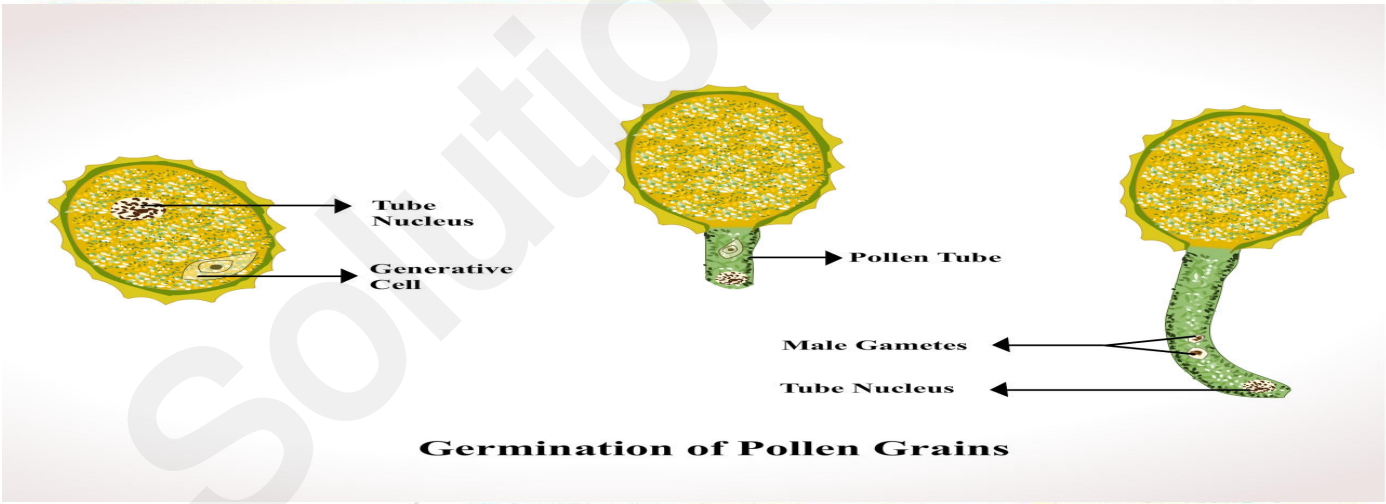
5. Where do the pollens germinate naturally?

Naturally pollen grains germinate on stigma

6. Name the nutrient element which plays a major role in pollen germination

Sucrose provides nutrition in the germ tube for its growth as a pollen tube.

7. Draw a well labelled diagram of male gametophyte in Angiosperms as observed by you.



Germination of Pollen Grains

Multiple Choice Questions

1. Movement of pollen tube towards an embryo sac is

a. thermotaetic
b. phoiotactic
c. chemotropic
d. thigmotropic

2. Outer wall of pollen grain is mode up of _____.

a. sporopollenin
b. pectocellulose
c. protein
d. lipids

3. How many mitotic divisions take place during germination of pollen grain and its **development** into mature gametophyte?

a. 3
b. 1
c. 5
d. 2

4. Triporate pollen grain is commonly found in _____.

a. monocot plants
b. dicot plants
c. ptendophytes
d. gymnosperms

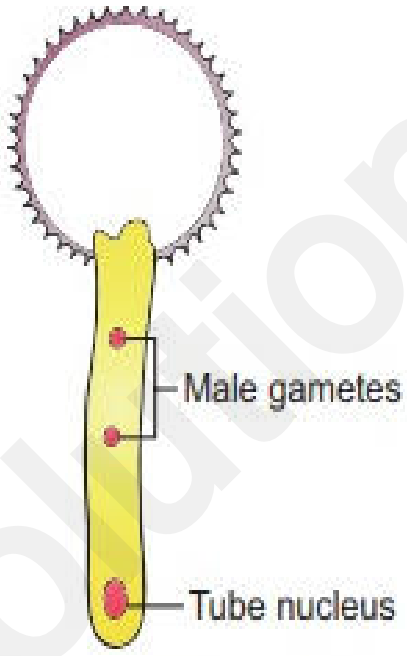
5 How many prothallial cells develop during development of male gametophyte in Angiosperms?

a. One prothallial cel!
b. No prothallial cell
c. Egual to number of gametes produced
d. Equal to number of tube cells produced

6. Uniporate or monocolpate pollen grain is found in _____.

a. monocot plants
b. dicot plants
c. gymnosperms
d. pteridophytes

Observe the slide and draw the diagram.



Remark and Signature of Teacher .....

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