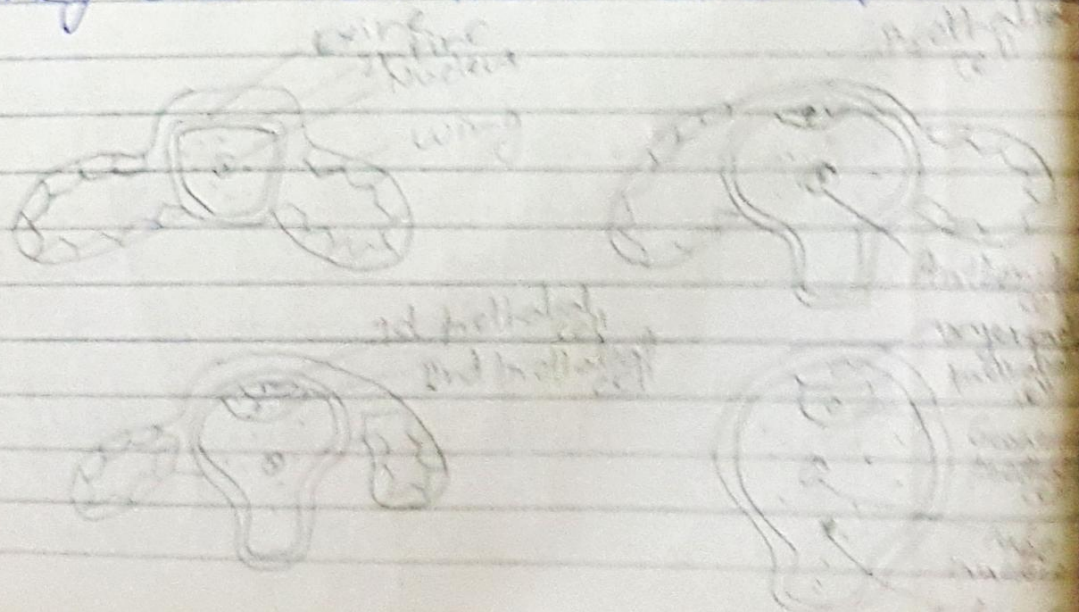
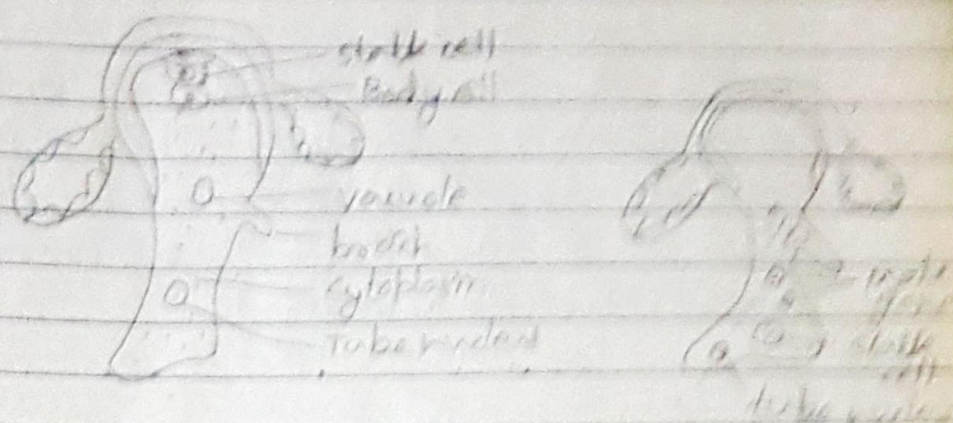


## DEVELOPMENT & STRUCTURE OF MALE GAMETOPHYTE IN GYMNOSPERM →

**Pinus** → In Pinus the microspore divides twice to give rise two prothallial cells and a antheridial cell which again divides to give rise the tube nucleus and a generative cell. Now it is four celled stage. The microsporopangial wall ruptures to release the semi germinated microspores. They become transferred into chamber like Gyas through pollen drop mechanism. The tube nucleus elongates to form the pollen tube. It unlike Gyas functions as a sperm carrier. The generative cell divides to give rise the stalk cell and the body cell. The nuclei of the body cell migrate into pollen tube and then divides mitotically into two nuclei. They form the male gametes. They are non-motile and equal in size.



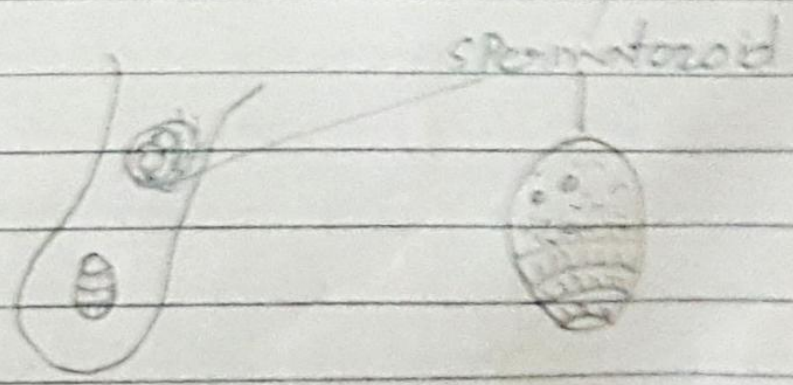
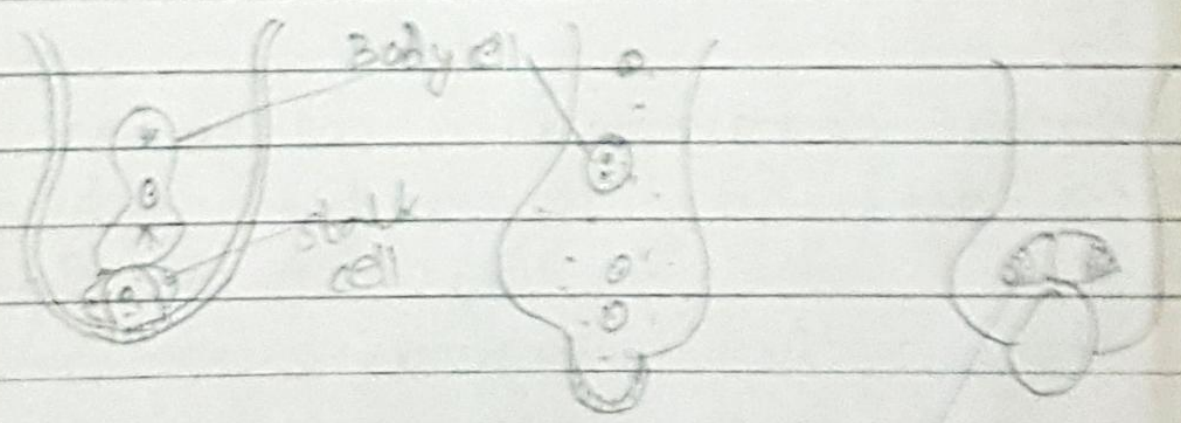
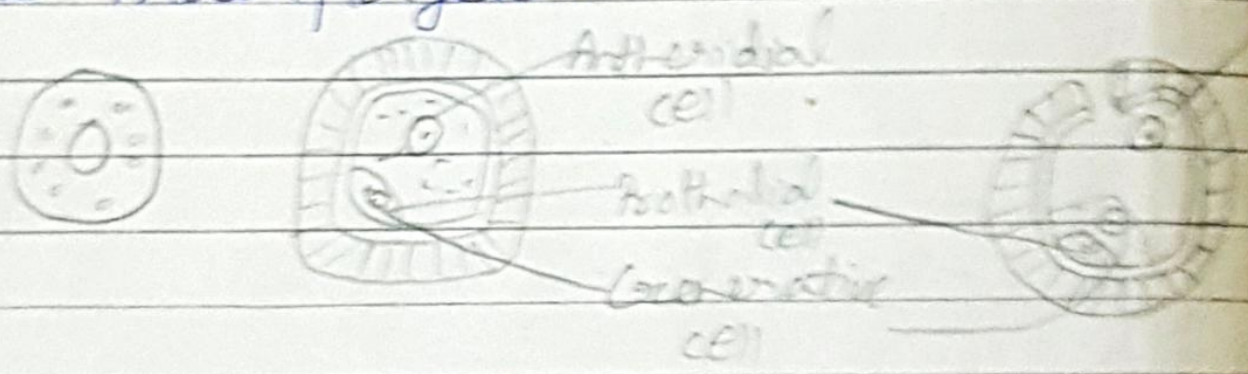


Germination of Pollen grain in *P. taxburghii*

**CYCAS** → In cycas the microspore divides to a lenticular prothallial cell and a large antheridial cell which divides to form a generative cell and a tube cell. At this stage three celled stage. The semigerminated microspore is released from the microsporangium. They are transferred to the microstyle by wind. They shift down to the pollen chamber by pollen drop mechanisms ~~over~~ where tube nucleus develops into the pollen tube. The generative cell divides into the stalk cell and the body cell. Each body cell divides to form the two multiciliate large sized sperms or male gametes.

In micro cycas the stalk cell divides into 10 or 11 body cells all of which divide to produce 20 or 22 sperms. In

Ceratozomia, there are two male prot-  
 -llus cell, a stalk cell, a body cell  
 and a tube nucleus. The generative  
 cell divide antichlorally into stalk cell  
 and a body cell. The two male gametes  
 are multiflagellate.



Development of Male gametophyte in Ceratium