

MICROSPOROGENESIS

7

- Pollen grains or microspores develop from the sporogenous tissue.
- Primary sporogenous tissue cell or they undergo several mitotic divisions to form microspore mother cells.
- Each M.M.C undergoes meiosis to & form four (4) haploid microspores. The formation of microspores from sporogenous tissue is known as microsporogenesis.
- ⇒ All sporogenous cells of an anther are capable of forming microspores but usually some of these cells degenerate & provide nourishment to the active sporogenous cells.
- ⇒ In some Gentianaceae the tapetum is not well developed & then the nutritive function is taken up by sporogenous tissue.
- ⇒ Microsporogenesis in Cyperaceae is diff^t from the other families.
- ⇒ In Cyperaceae, out of 4 haploid nuclei, only one is functional and the remaining three degenerate; thus in Cyperaceae each M.M.C. form only a single microspore.
- ⇒ Microspore of tetrad are separated by callose wall. except in some orchids (microspore show cytoplasmic connection).

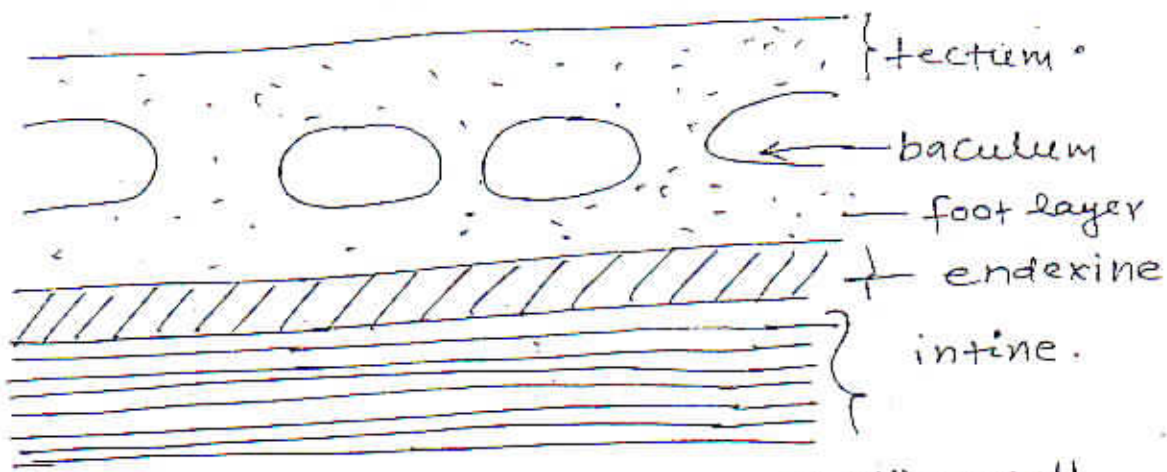
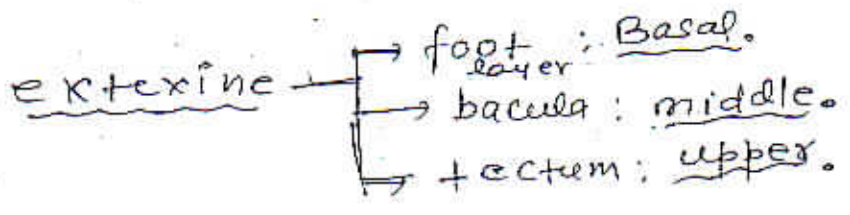
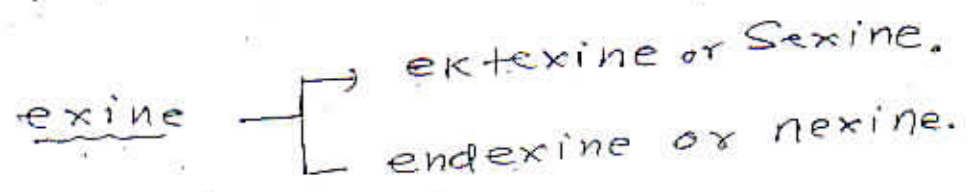
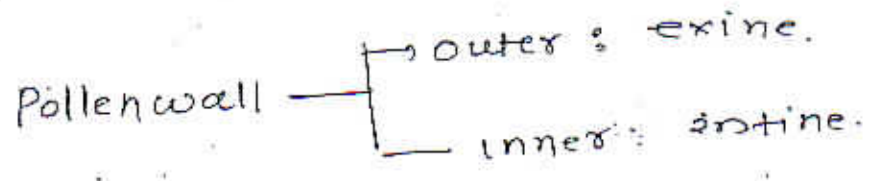


Fig: Ultrastructure of Pollen wall



* Sporopollenin: → chief component of pollen grain.

- Considered to be Oxidative polymer of Carotenoid and/or Carotenoid esters.
- It is a tough substance & biological providing resistance to physical & biological decomposition & thus check natural decay of pollengrains.

→ Preservation of pollengrains during fossilization is due to the presence of sporopollenin.

10 → The exine is completely absent or represented by endexine only below the pore or aperture-region.

Intine → is composed of pectin & cellulose.
→ fibrils of cellulose are arranged llr to the pollen surface.
→ is usually thicker under the pores & at these points it also contains enzymatic proteins.

Pollen Kitt :- In insect pollinated species, the surface of the pollen grains is covered by an oily layer called pollenkitt.
- The sticky nature, colour & smell of pollen grains is due to its presence.
- The substances necessary for secretion & synthesis of pollenkitt are secreted by the tapetal cells.

- functions - help in attracting insects.
- protects pollen grains from U.V. radiation
- its sticky nature helps in sticking pollen to insect body

Cytoplasm of pollen grains -

- contains dictyosomes, mitochondria & E.R.
- densely cytoplasmic as long as they in tetrad.
- cytoplasm vacuolated & enlarges most after release from tetrad.

Development of Male gametophyte.

(11)

• Pollen grain $\xrightarrow{\text{mitosis}}$ 2 unequal cells $\begin{cases} \text{larger} \\ \text{"Vegetative cell."} \\ \text{smaller} \\ \text{Generative cell.} \end{cases}$

? • Vegetative cell $\xrightarrow[\text{into}]{\text{develops}}$ pollen tube.

⇒ Generative cell $\xrightarrow[\text{"}]{\text{forms}}$ Male gamete A.

⇒ Pollen grains — when separated from the tetrad, are unicellular.

- The mitotic spindle of the pollen grain is asymmetrical.

* Vegetative Cell —

- The vegetative cell normally does not divide, although it is capable of "DNA synthesis."
- RNA & proteins are also present.
- Contains ribosome, RER, plastid, active dictyosomes, mitochondria, fat & starch grains.

* Generative cell:

- arcuate in outline.
- There is no cytoplasmic connection b/w veg. & generative cell.
- relative dense cytoplasm.
- contains ribosomes, E.R., dictyosomes

* formation of male gametes : —

- formed by mitotic divⁿ of the generative cell.
- divⁿ usually occurs before the pollen is shed from the anther.

- [Male gametes : — two, non-motile, — limited by cell membrane, — in most angiosperms, cell wall is not present.