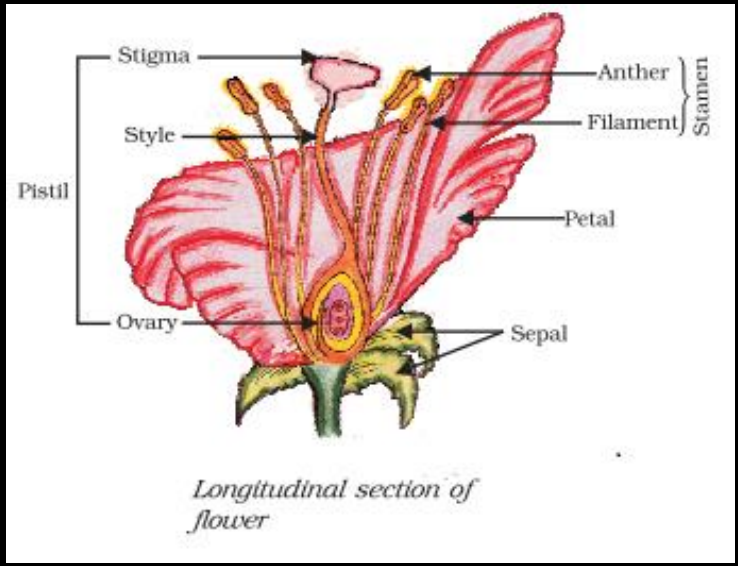
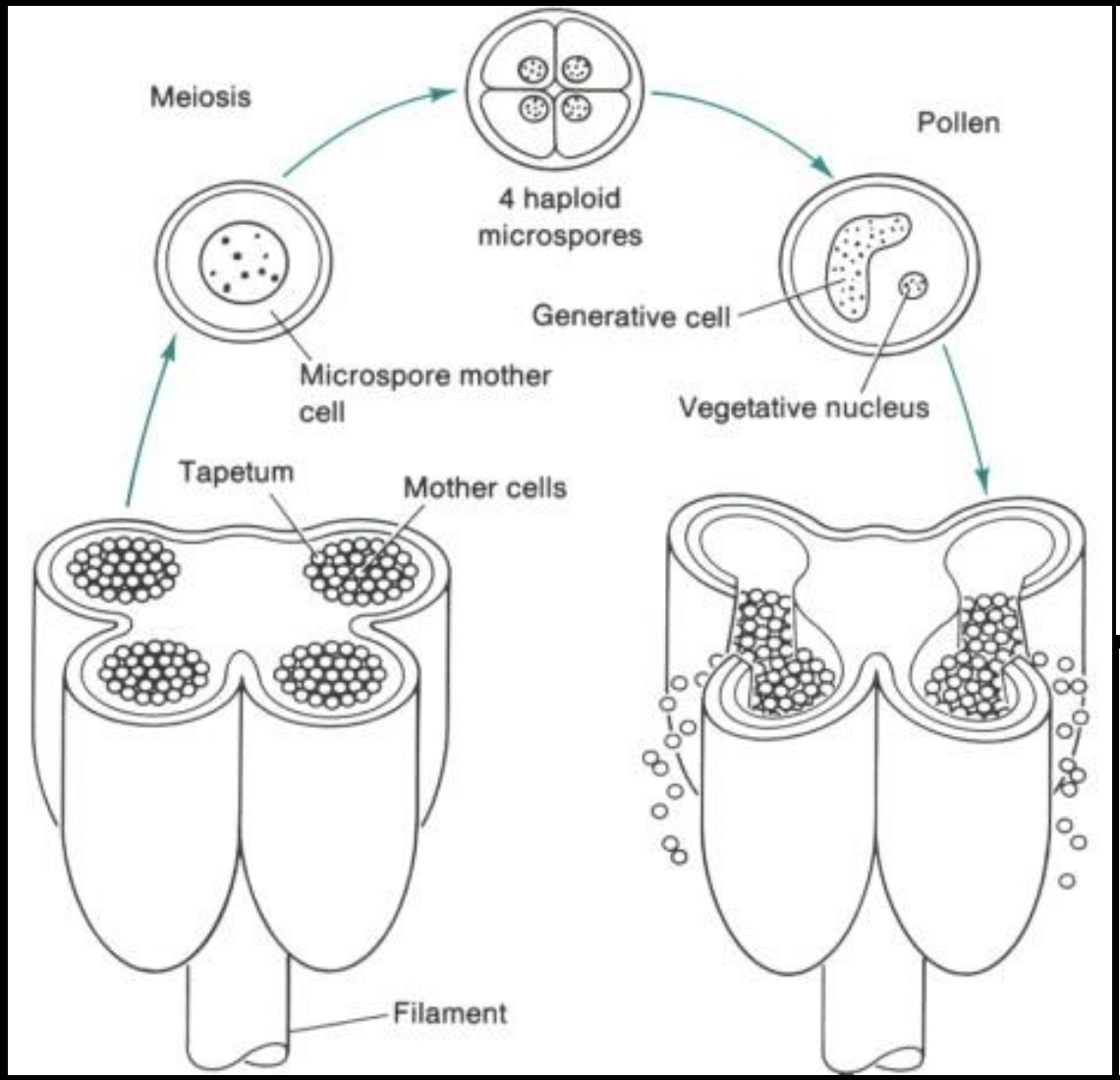
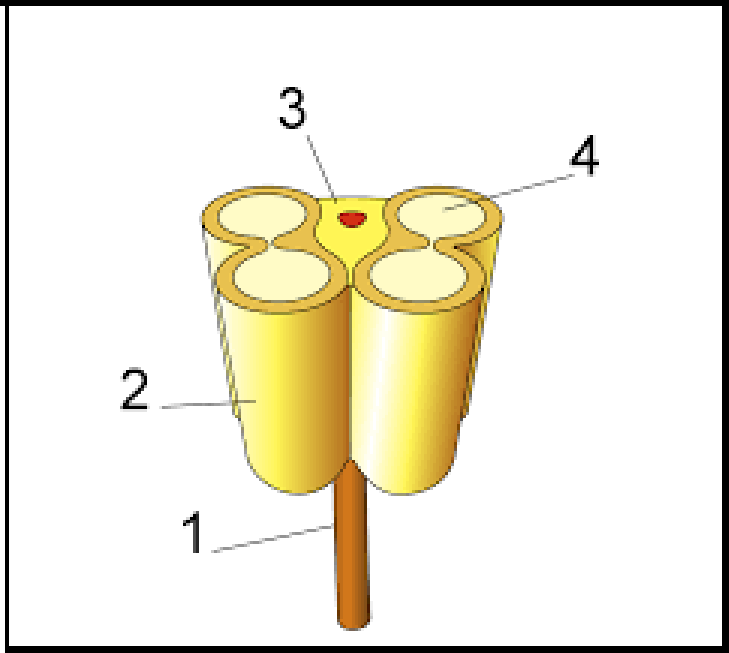
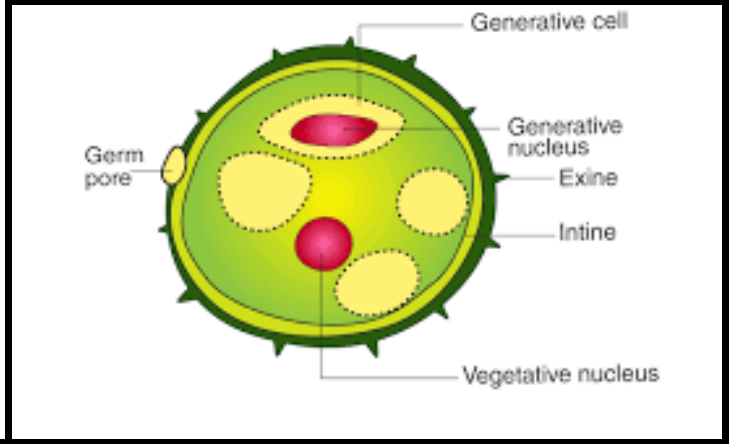
Structural organization of flower




Meiosis
4 haploid microspores
Pollen
Generative cell
Microspore mother cell
Vegetative nucleus
Tapetum
Mother cells
Filament


3
4
2
1


Generative cell
Generative nucleus
Germ pore
Exine
Intine
Vegetative nucleus

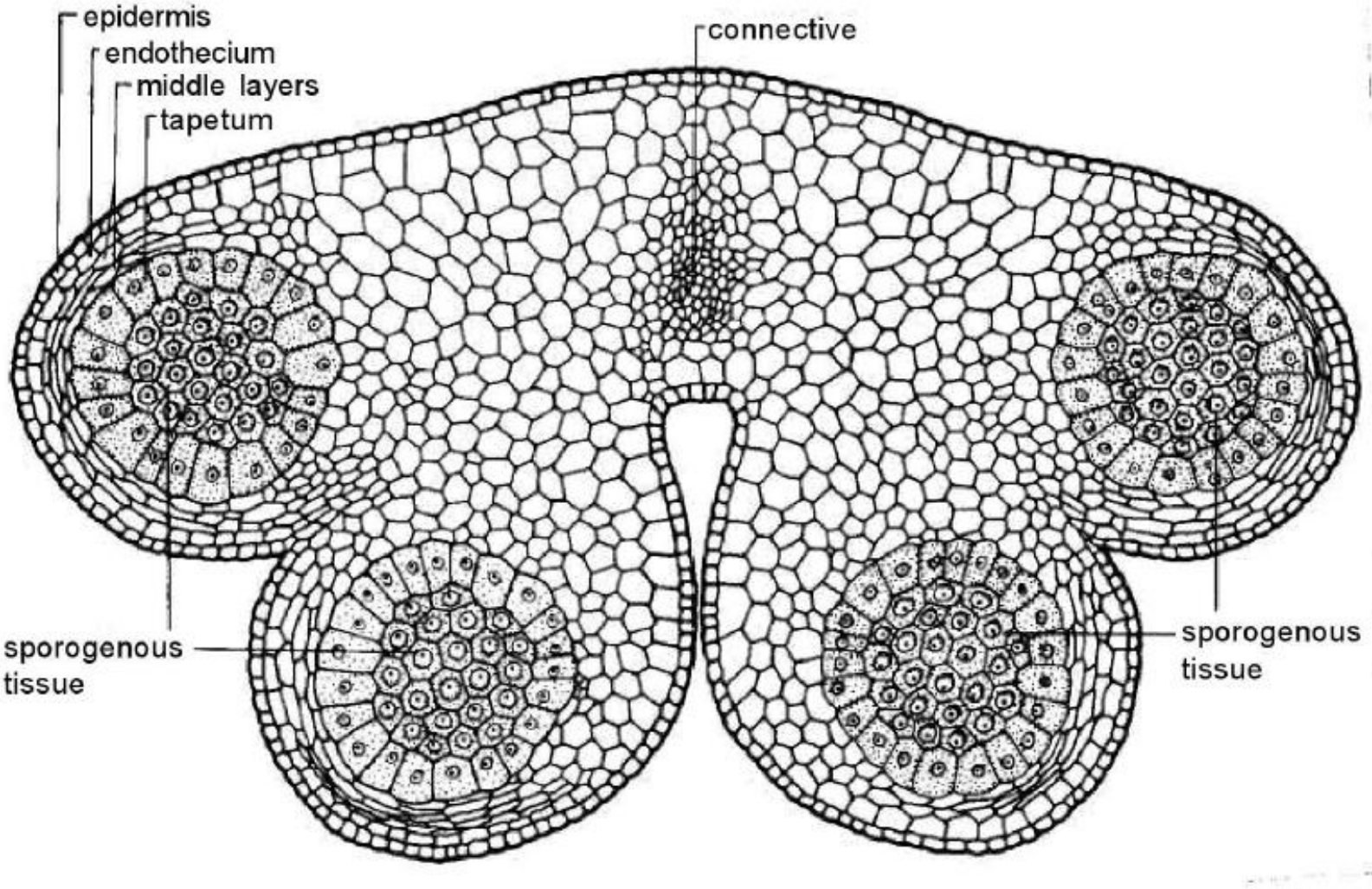


Fig. 3.1 Transverse section of a tetrasporangiate anther to show its various tissues.

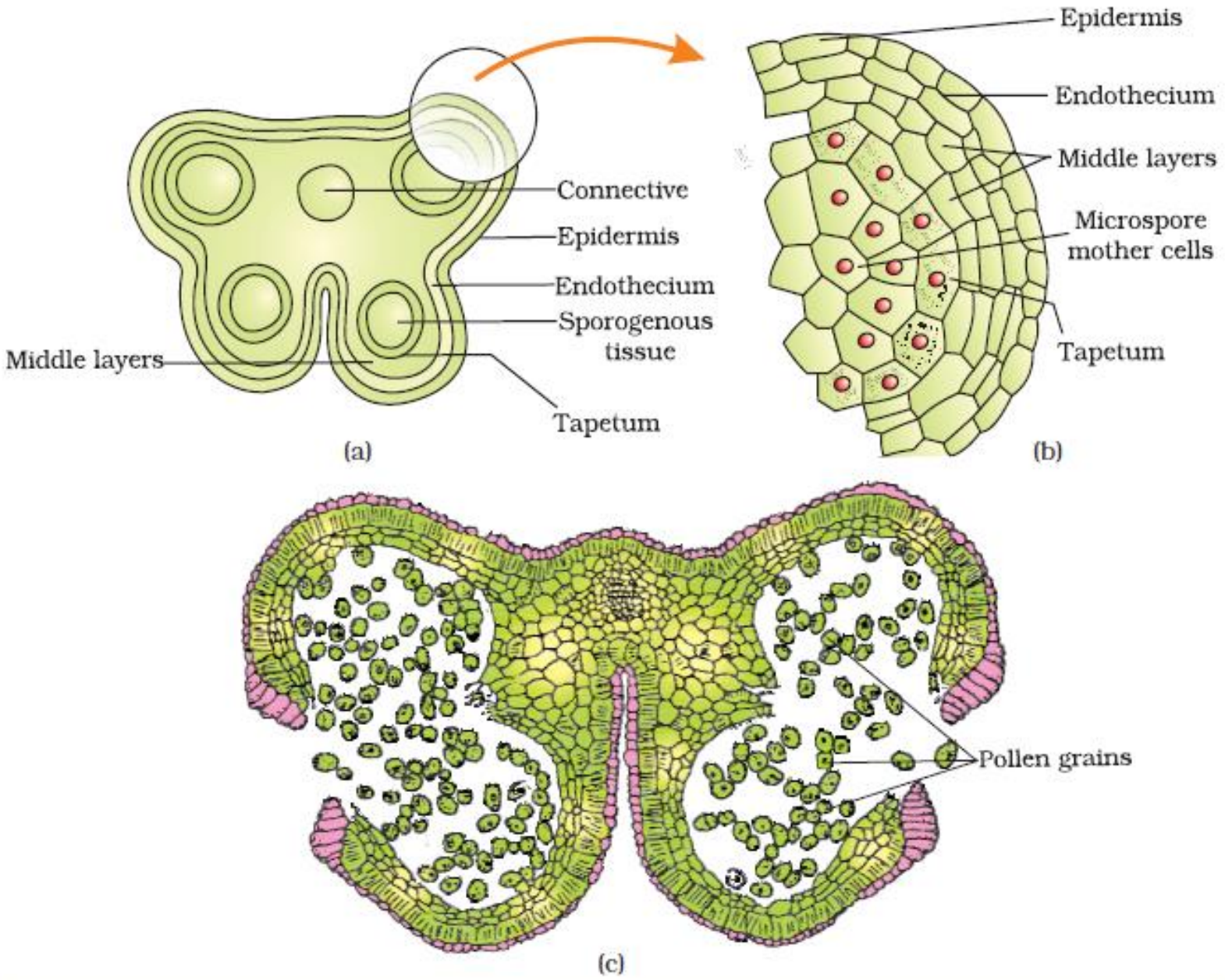
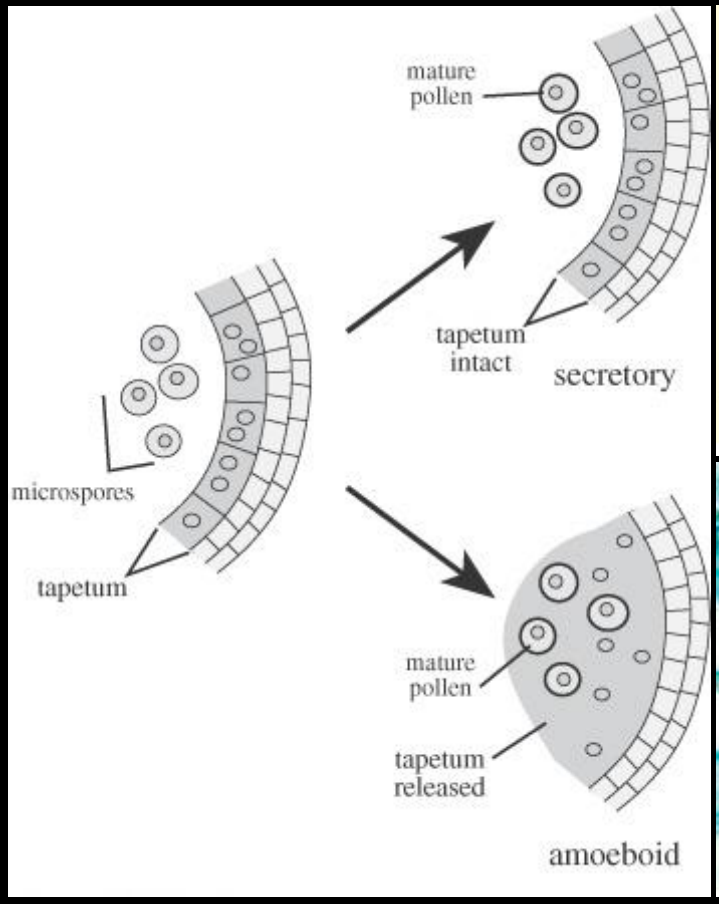
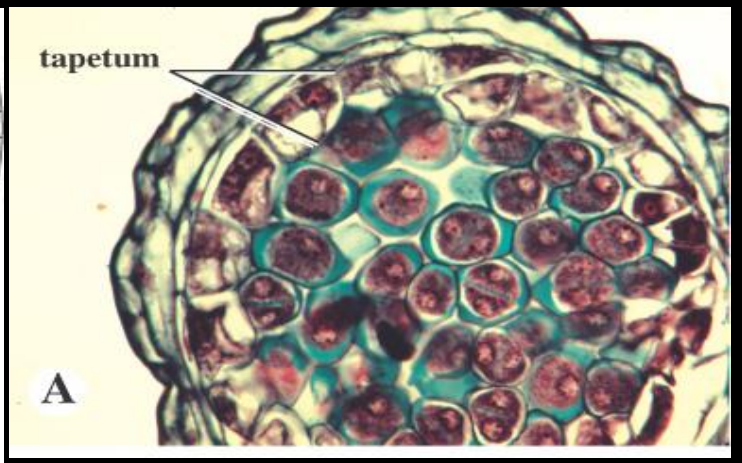
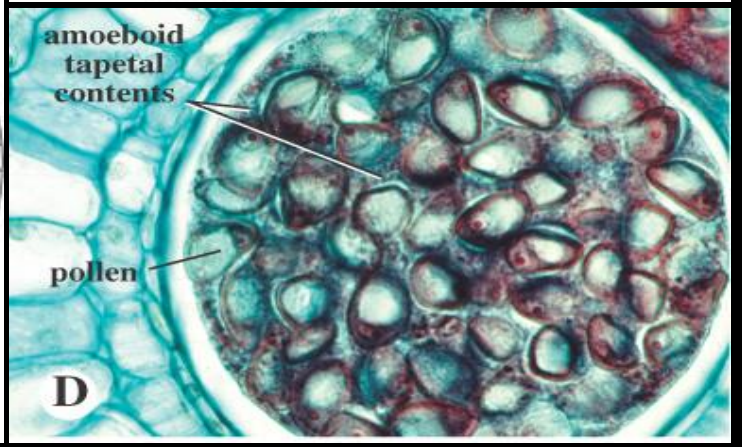


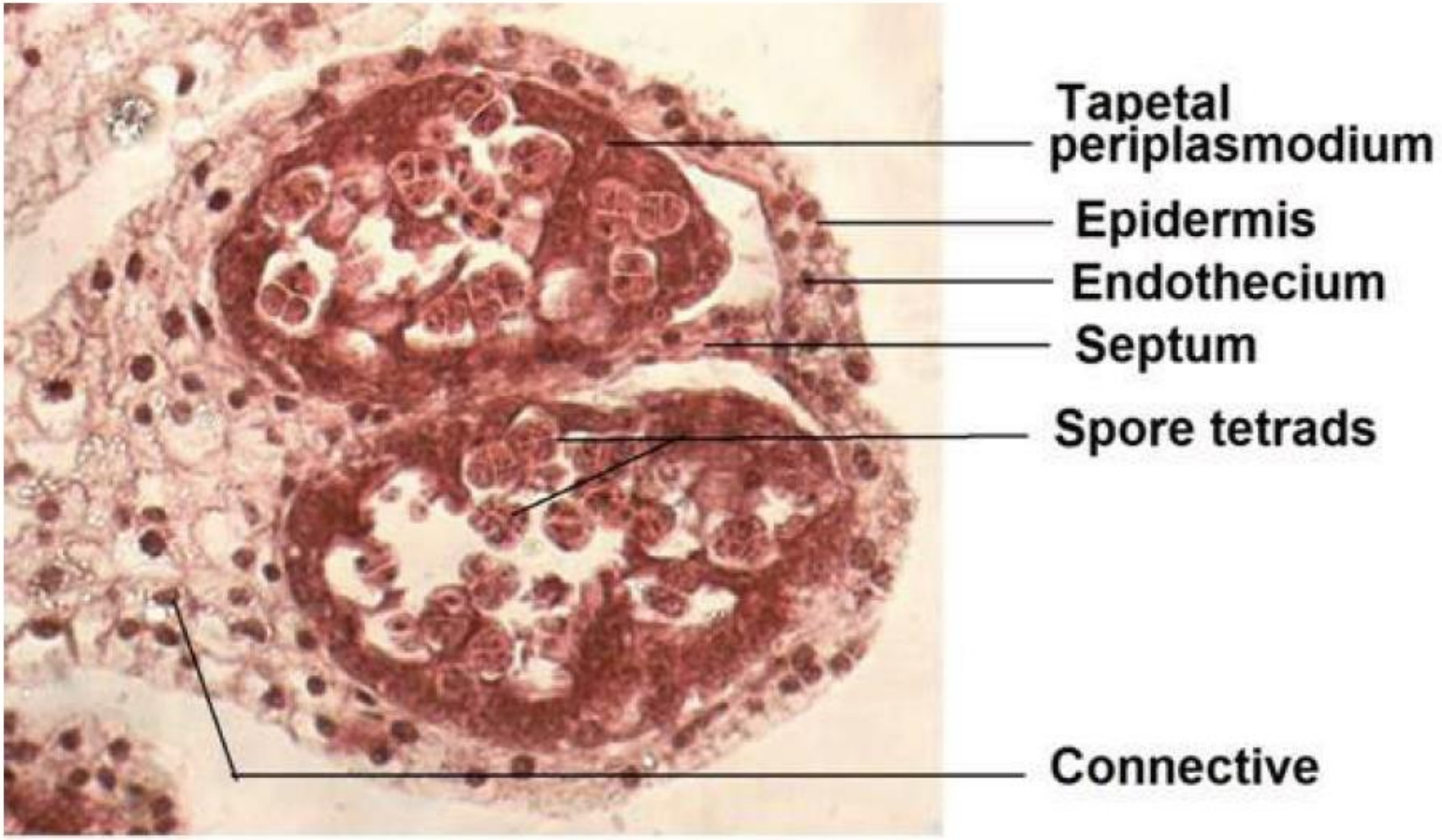
Figure 2.3 (a) Transverse section of a mature anther; (b) Enlarged view of one microsporangium showing wall layers; (c) A dehisced anther

Tapetum


mature pollen
tapetum intact
secretory
microspores
tapetum
mature pollen
tapetum released
amoeboid

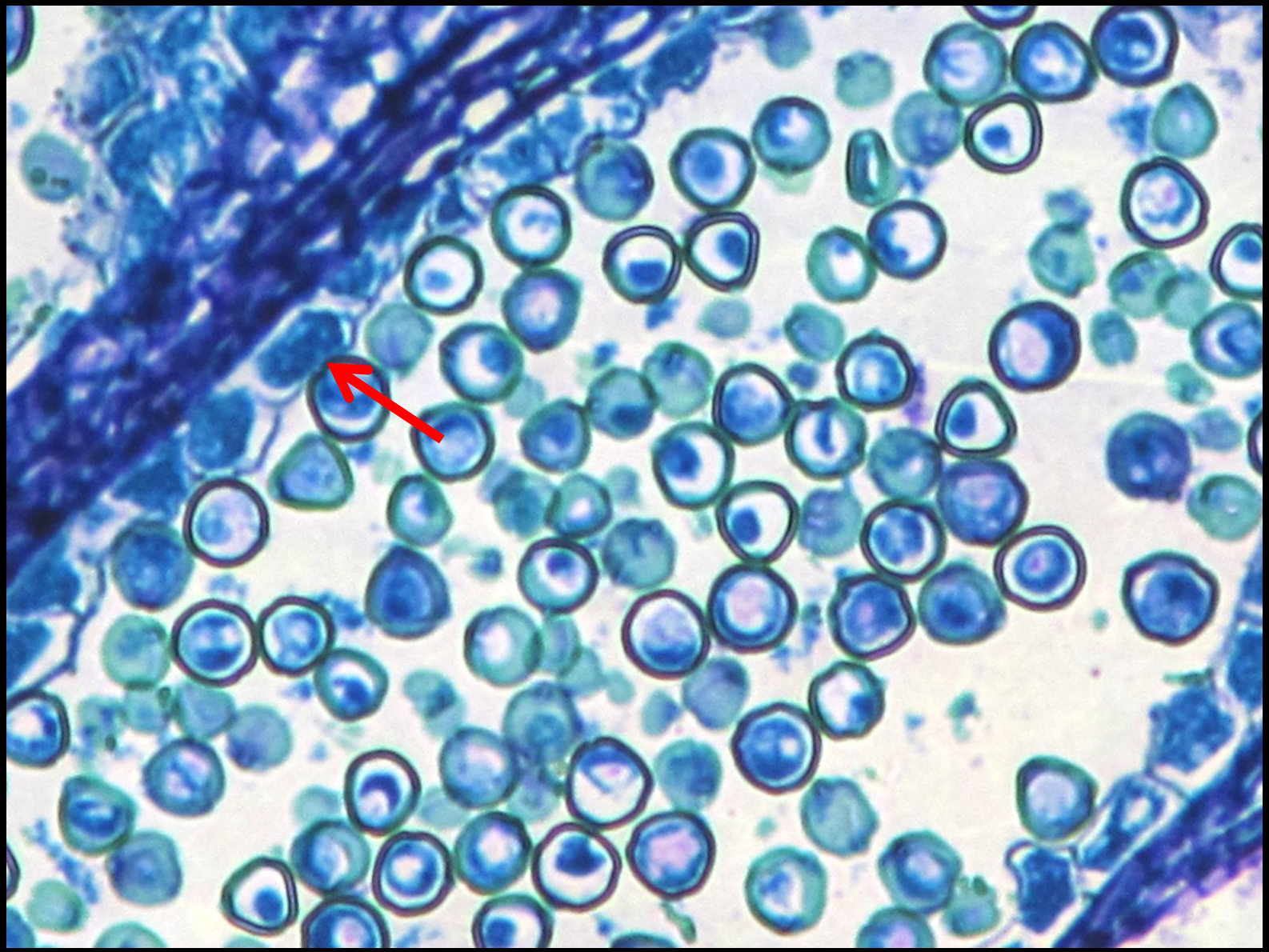

tapetum
A


amoeboid tapetal contents
pollen
D



T.s. anther with amoeboid tapetum and spore tetrads

SECRETORY TAPETUM



NUCLEAR BEHAVIOUR IN TAPETAL CELLS. A common feature of tapetum, amoeboid as well as secretory, is that the total DNA content of the tissue increases enormously through the meiotic prophase. This is achieved in one or more of the following ways:

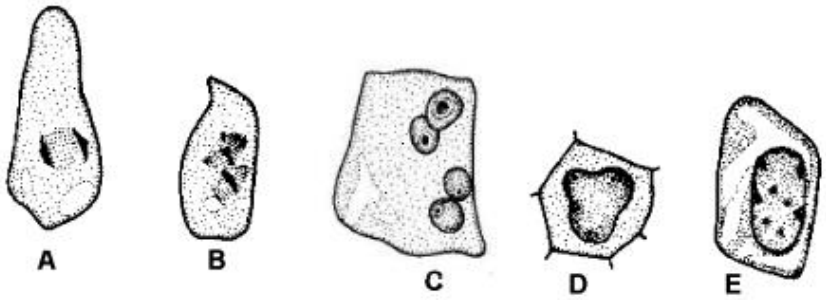


Fig. 3.7 Tapetal cells: **A-C, E.** *Mimusops elengi*. **D.** *Iodina rhombifolia*. **A.** A uninucleate cell in division. **B.** A binucleate cell showing synchronous mitoses. **C.** A tetranucleate cell. **D.** Probably a fusion product of four nuclei is seen in the cell. **E.** Probably an octaploid cell. (A-C, E. *after* Bhatnagar and Gupta, 1970; D. *after* Bhatnagar and Sabharwal, 1969)

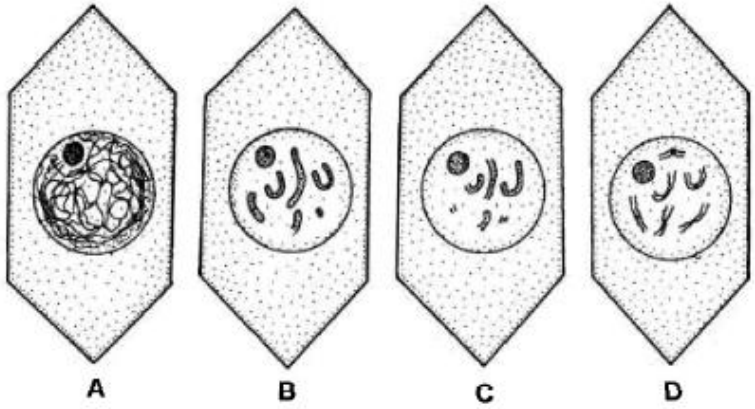


Fig. 3.8 Diagrams to show the process of endomitosis. **A.** Endoprophase. **B.** Endometaphase. **C.** Endoanaphase. **D.** Endotelophase.

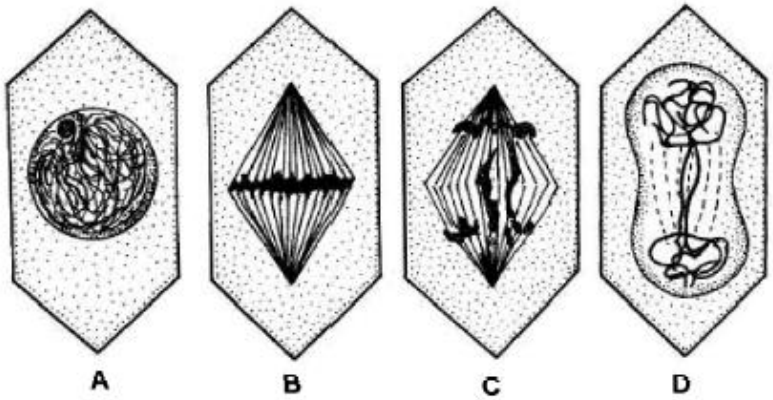


Fig. 3.9 Diagrams to show stages in the formation of a restitution nucleus. **A.** Prophase. **B.** Metaphase. **C.** Anaphase; note the chromosome bridges. **D.** Both the sets of chromosomes are enclosed in a common nuclear membrane to form a restitution nucleus.

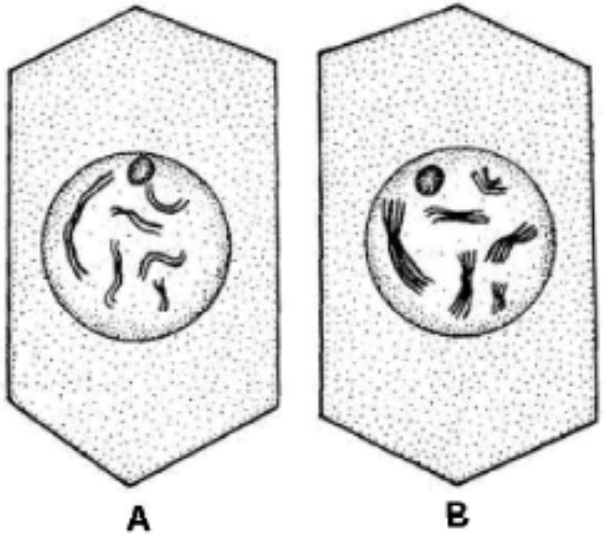
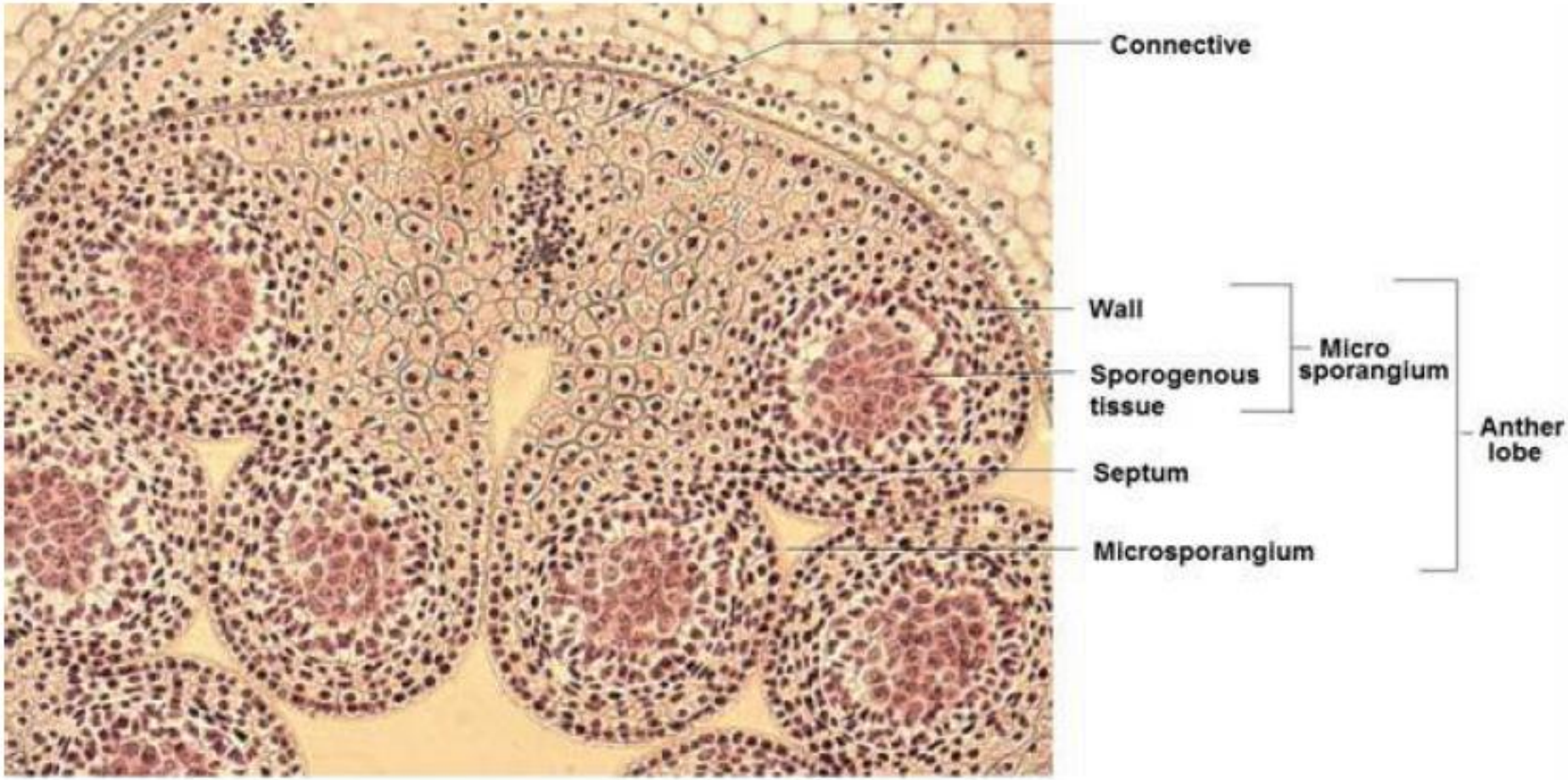
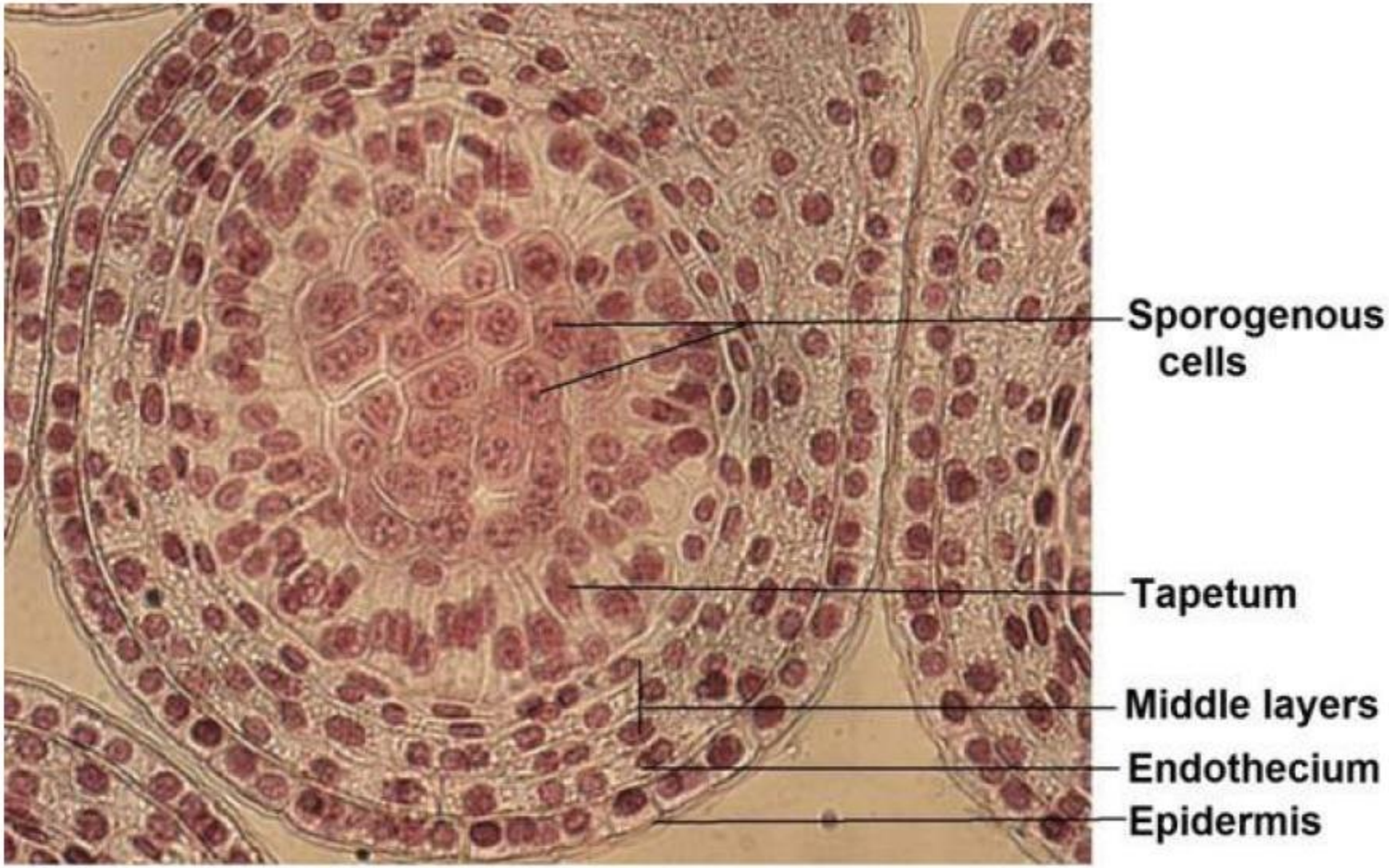


Fig. 3.10 Diagrams to illustrate the phenomenon of polyteny. **A.** A diploid cell with 6 chromosomes. Each one of the chromosomes has only two chromatids. **B.** A tetraploid cell. The number of chromosomes is maintained at six but now each chromosome possesses four chromatids.

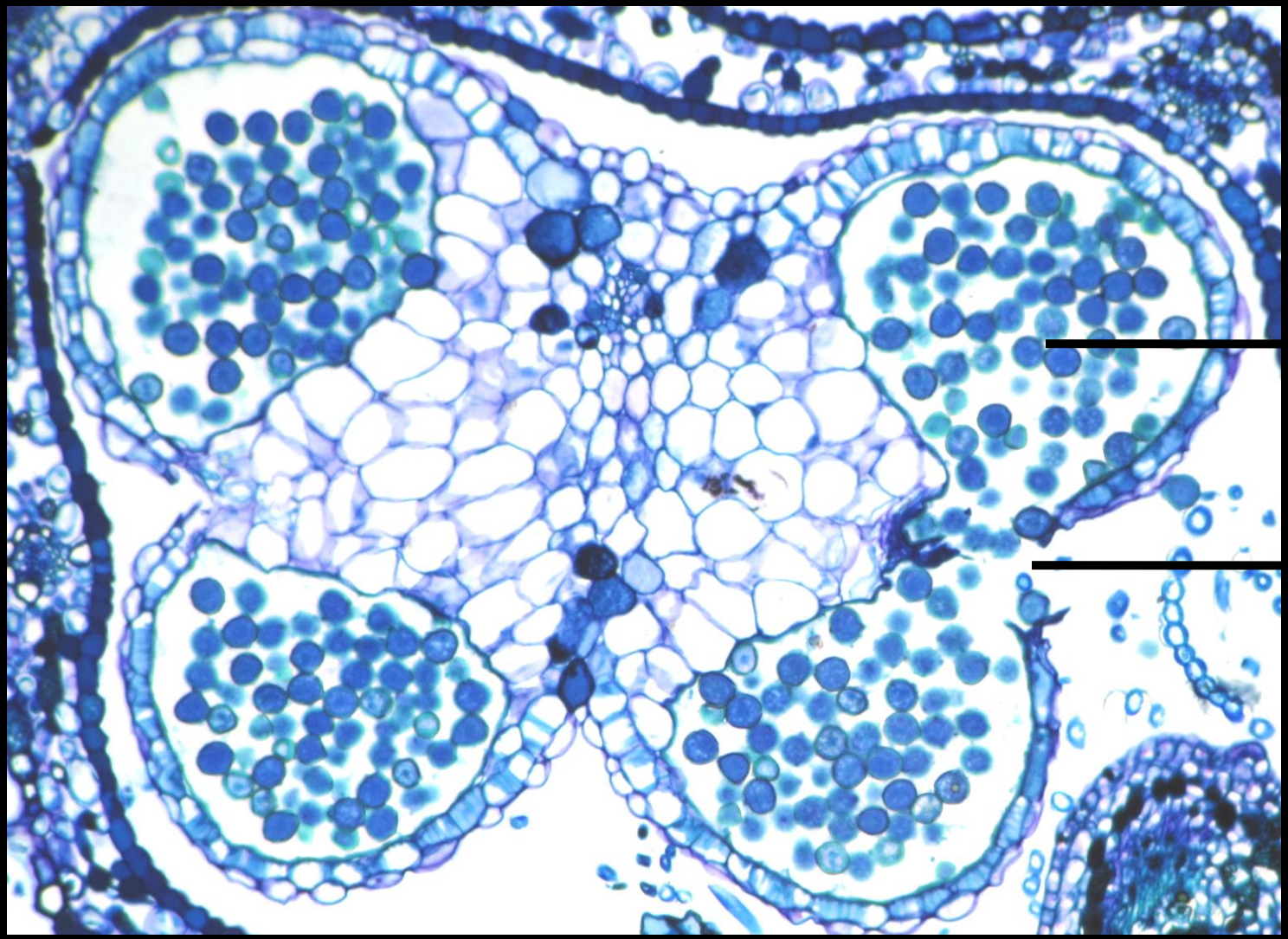


T.s. young anther with sporogenous tissue

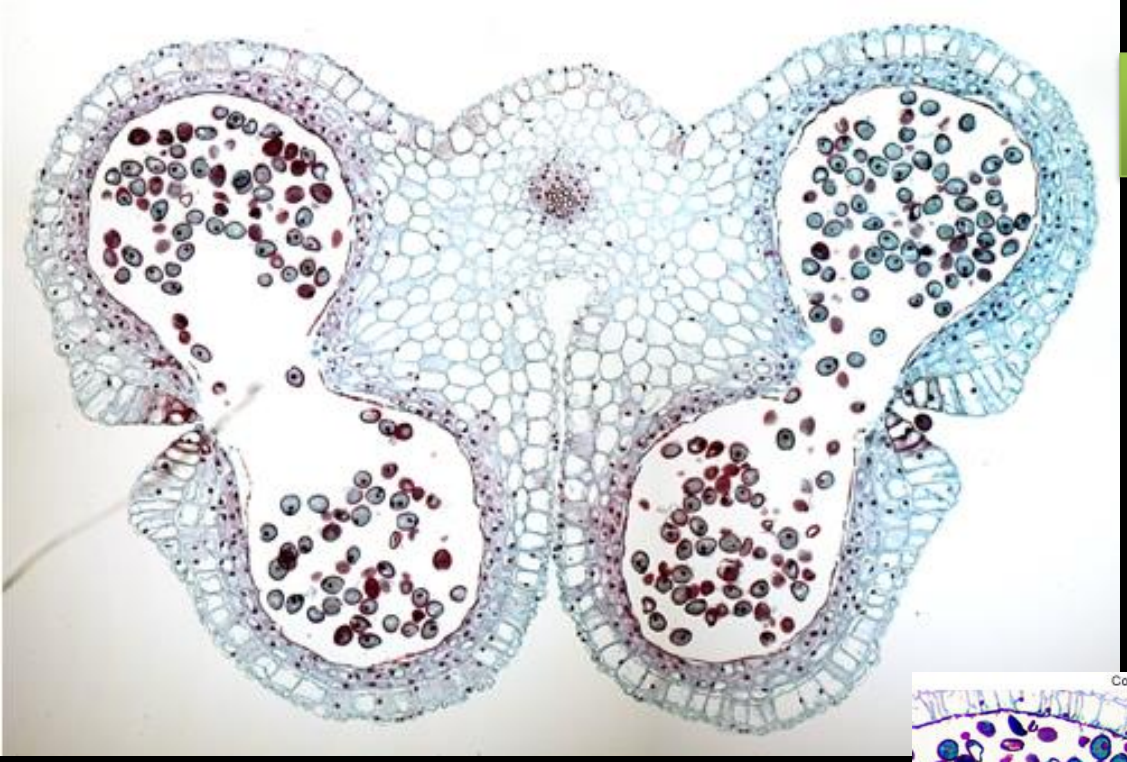


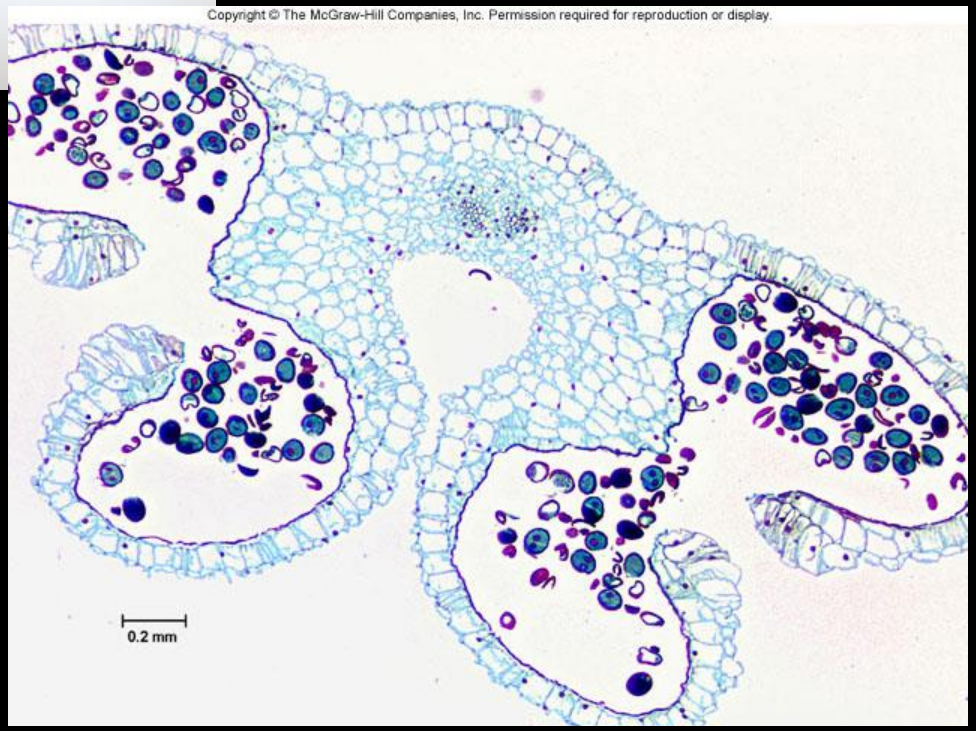
T.s. microsporangium of young anther

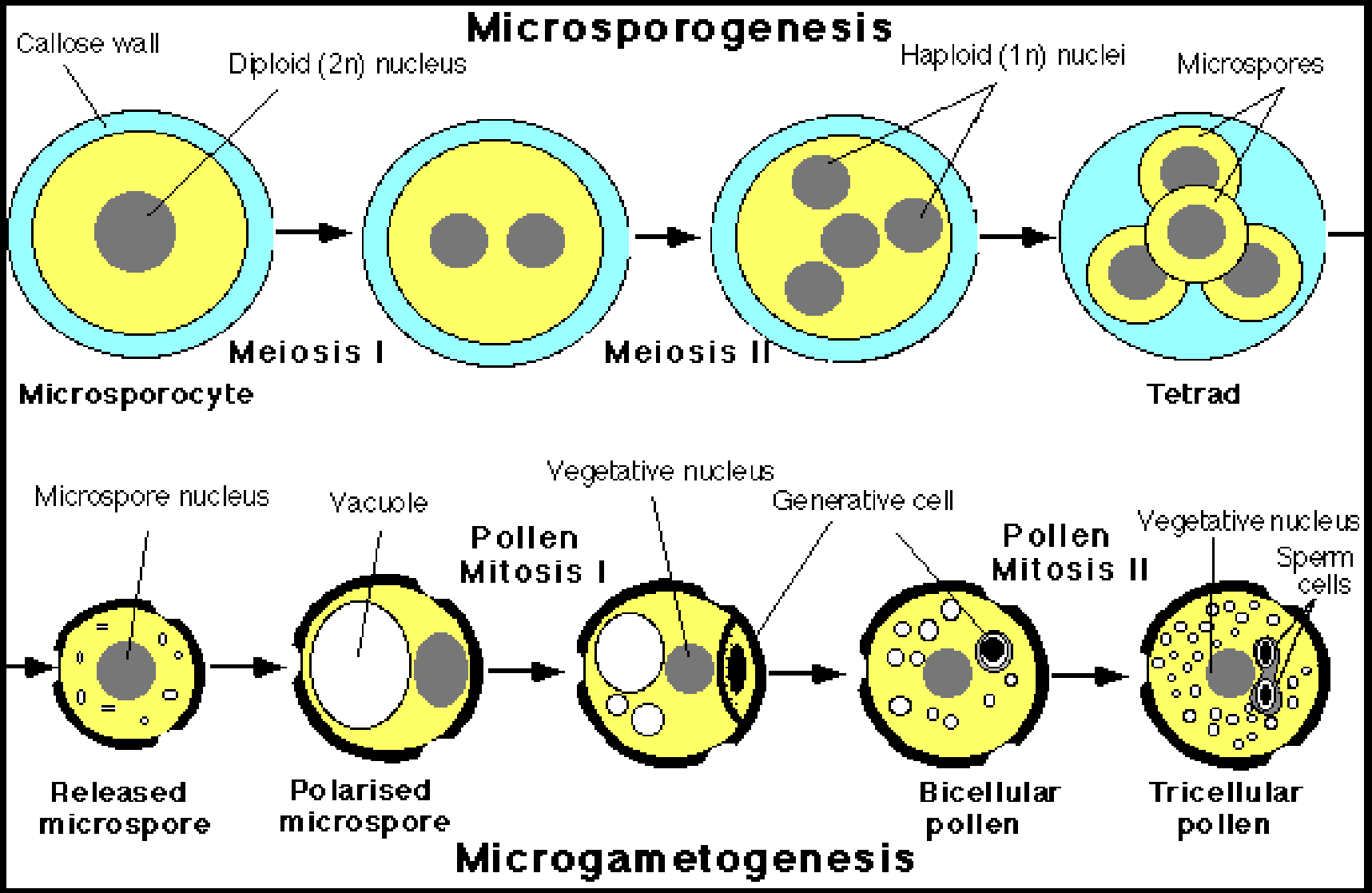
MATURE ANTHER



ANTHER DEHISCENCE






Microsporogenesis
Callose wall
Diploid (2n) nucleus
Haploid (1n) nuclei
Microspores
Meiosis I
Meiosis II
Microsporocyte
Tetrad
Microspore nucleus
Vacuole
Vegetative nucleus
Generative cell
Pollen Mitosis I
Pollen Mitosis II
Vegetative nucleus
Sperm cells
Released microspore
Polarised microspore
Bicellular pollen
Tricellular pollen
Microgametogenesis

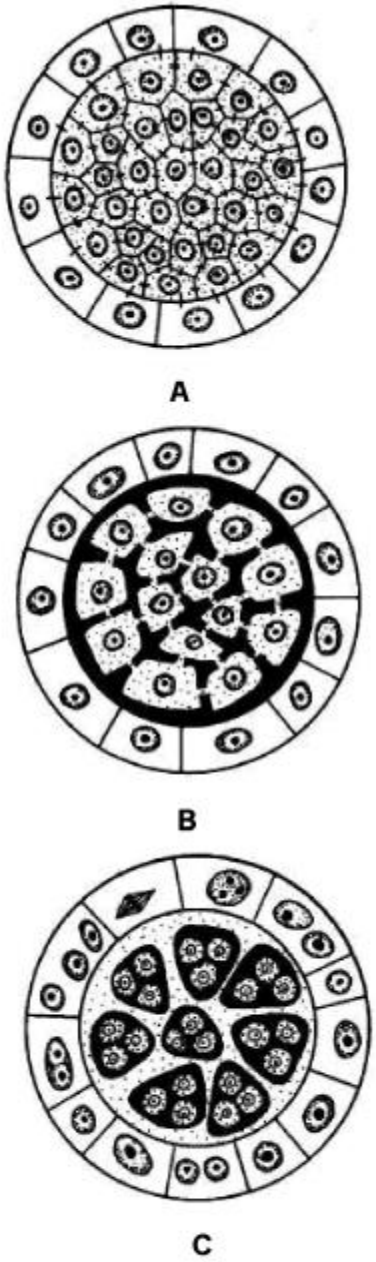
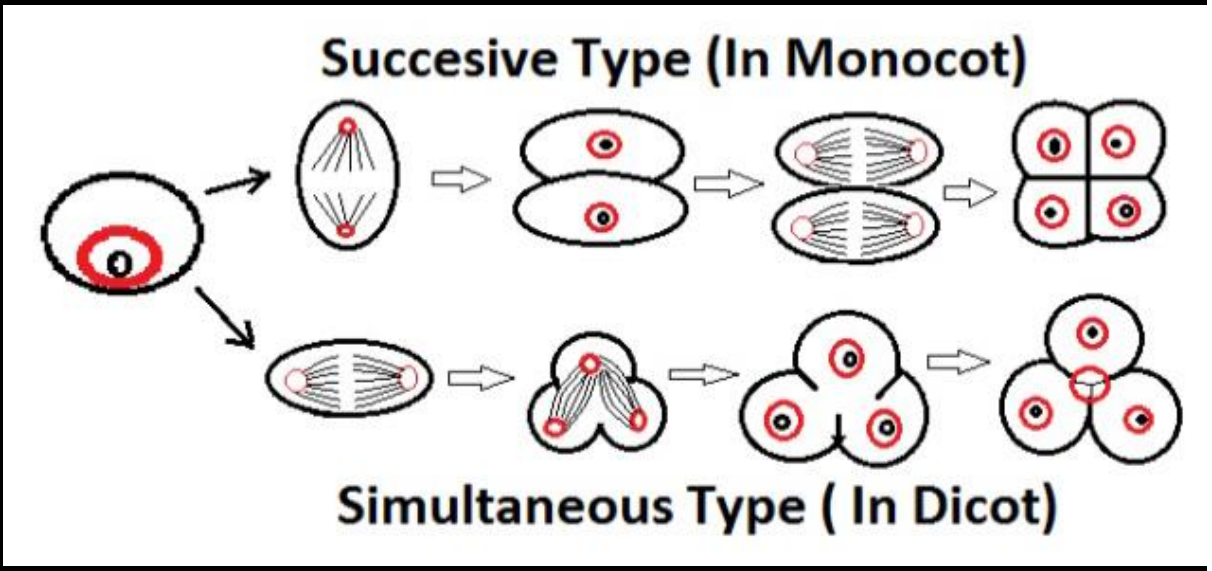
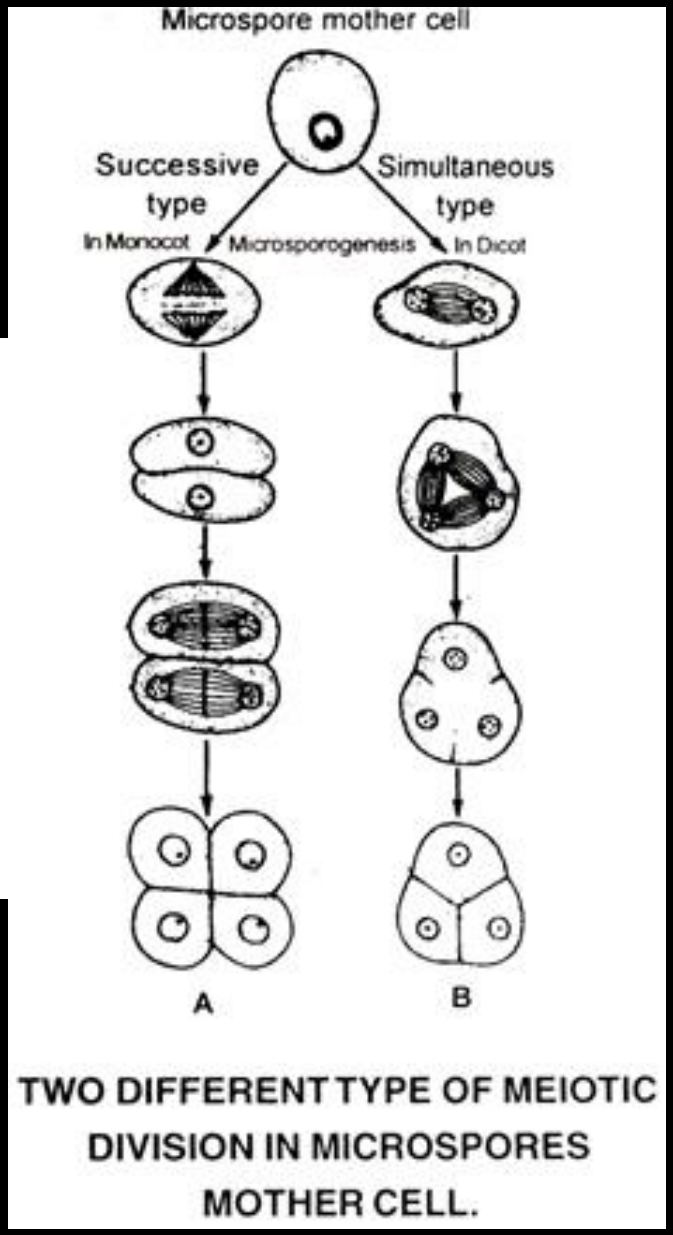


Fig. 3.11 Diagrams to show cellular interconnections in developing anther; only single-layered tapetum and the pollen mother cells





TWO DIFFERENT TYPE OF MEIOTIC DIVISION IN MICROSPORES MOTHER CELL.

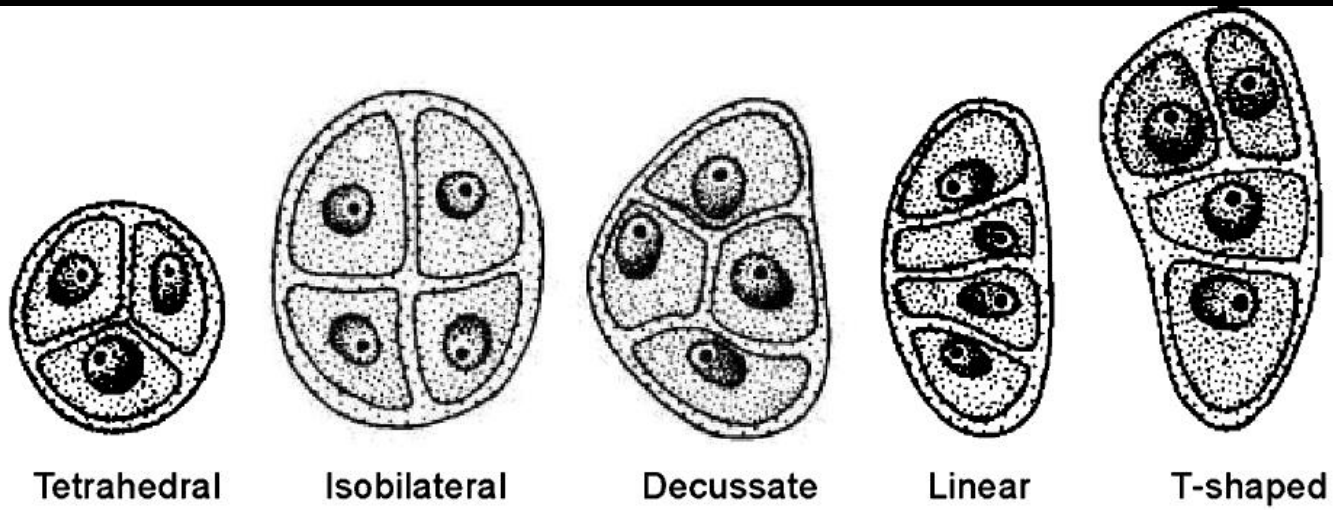
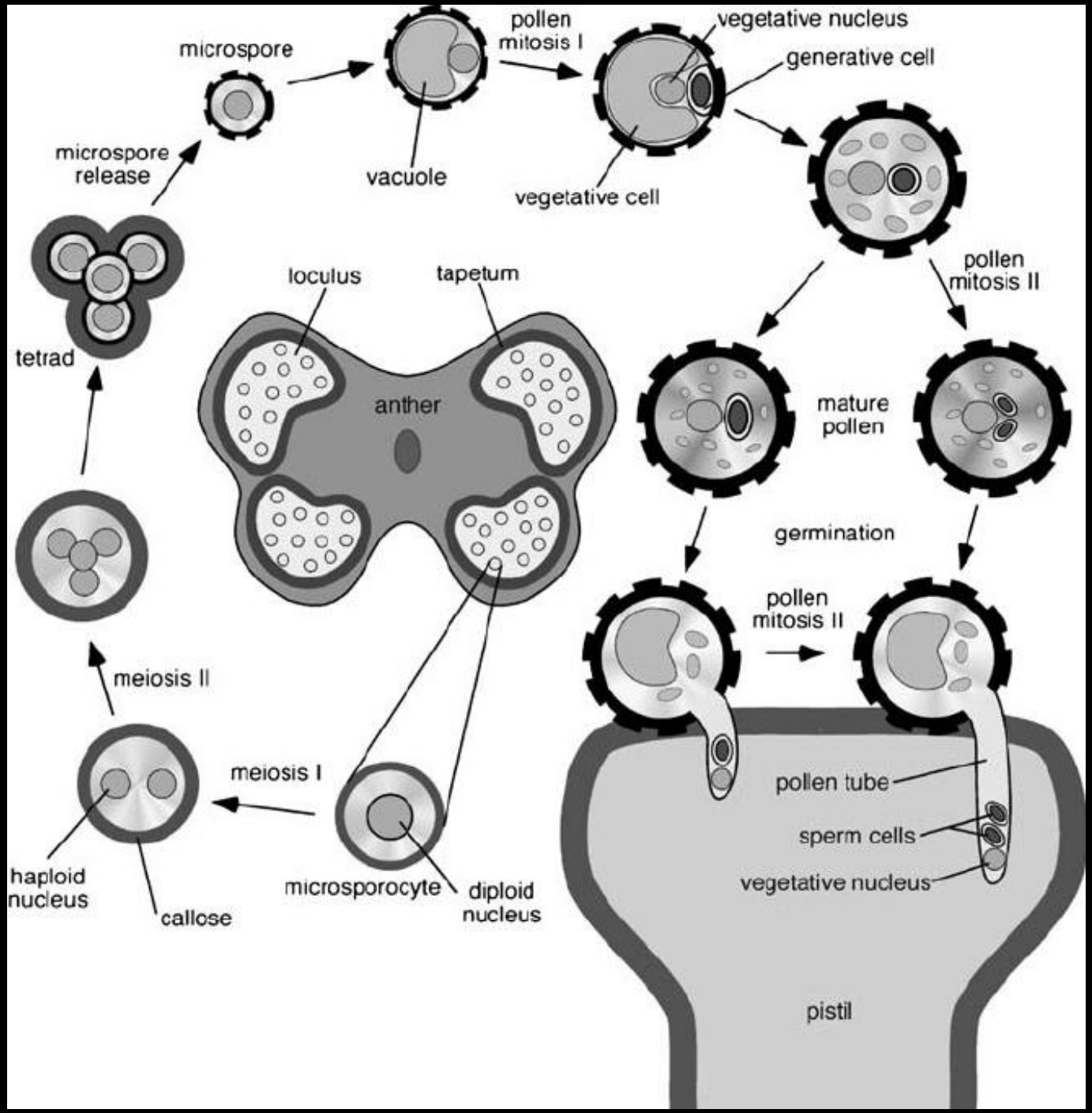
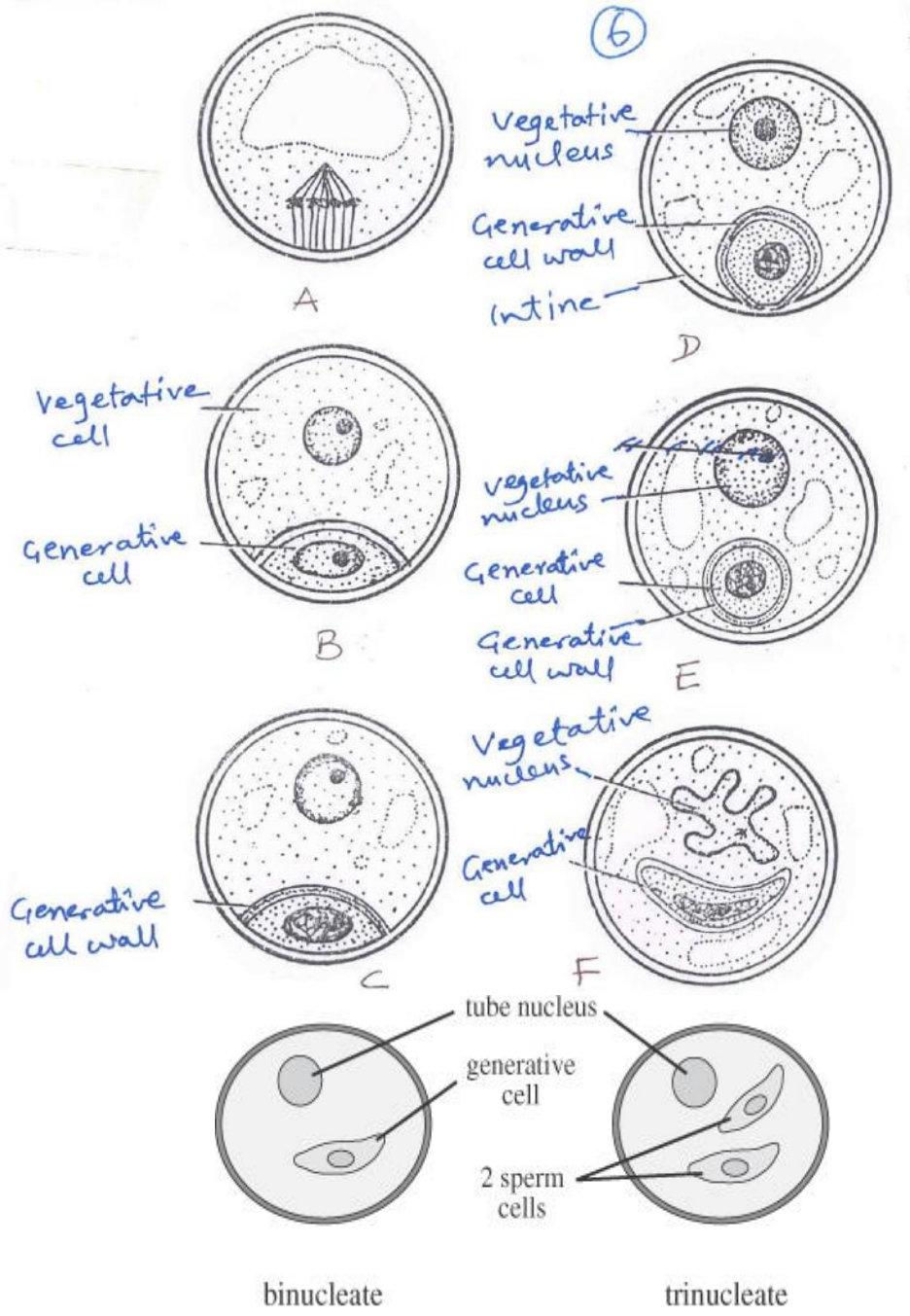


Fig. 3.14 Types of microspore tetrads in *Aristolochia elegans*. (*after* Johri and Bhatnagar, 1955)


microspore
pollen mitosis I
vegetative nucleus
generative cell
microspore release
vacuole
vegetative cell
pollen mitosis II
loculus
tapetum
tetrad
anther
mature pollen
germination
pollen mitosis II
meiosis II
meiosis I
pollen tube
sperm cells
vegetative nucleus
haploid nucleus
callose
microsporocyte
diploid nucleus
pistil


6
A
Vegetative nucleus
Generative cell wall
Intine
D
Vegetative cell
Generative cell
B
vegetative nucleus
Generative cell
Generative cell wall
E
Generative cell wall
C
Vegetative nucleus
Generative cell
F
tube nucleus
generative cell
2 sperm cells
binucleate
trinucleate

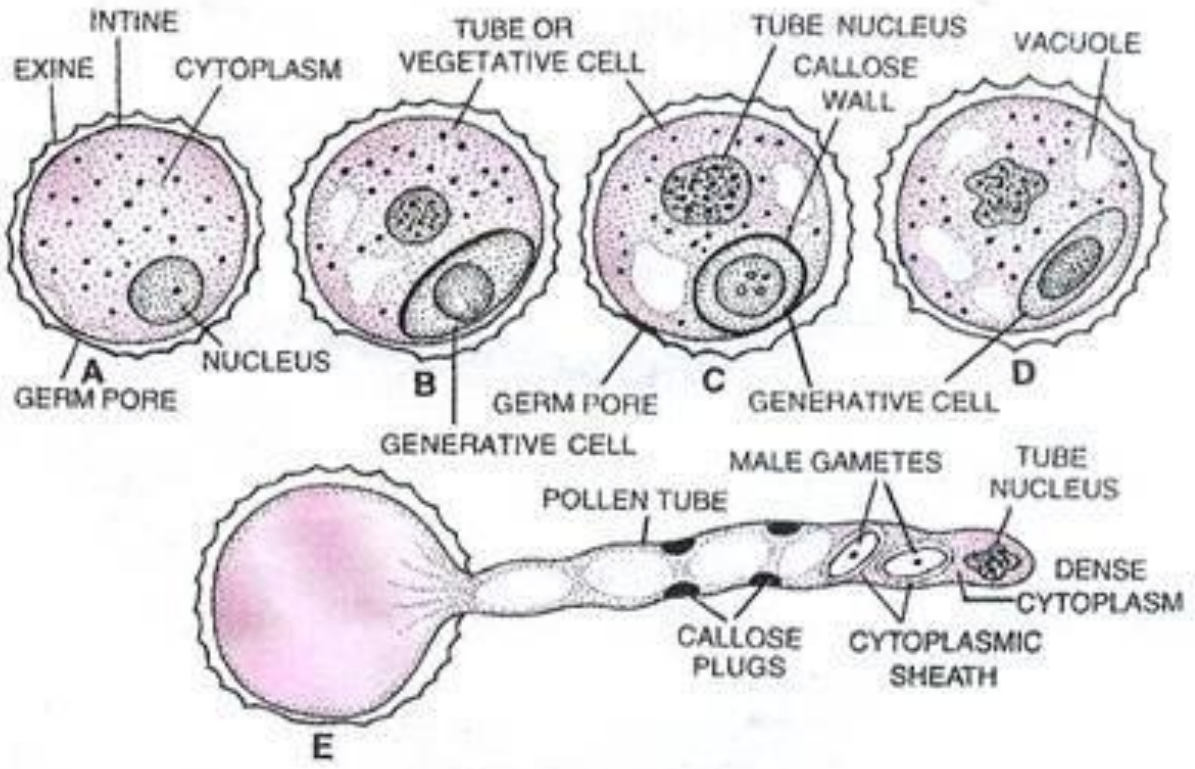


Fig. 2.9. Germination of pollen grain and formation of male gametophyte in an angiosperm.

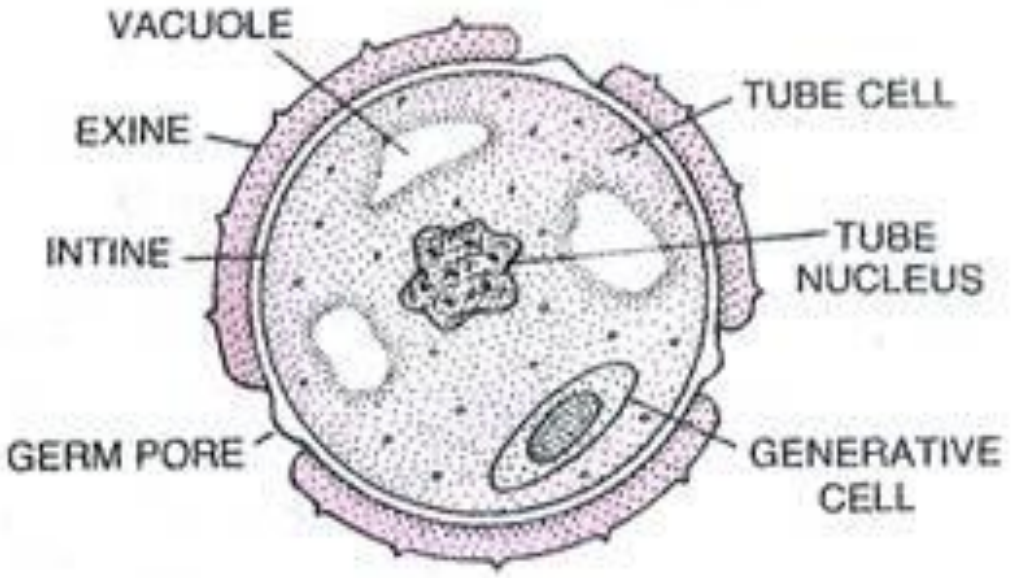


Fig. 2.7. Section of a mature 2 celled pollen grain of an angiosperm.

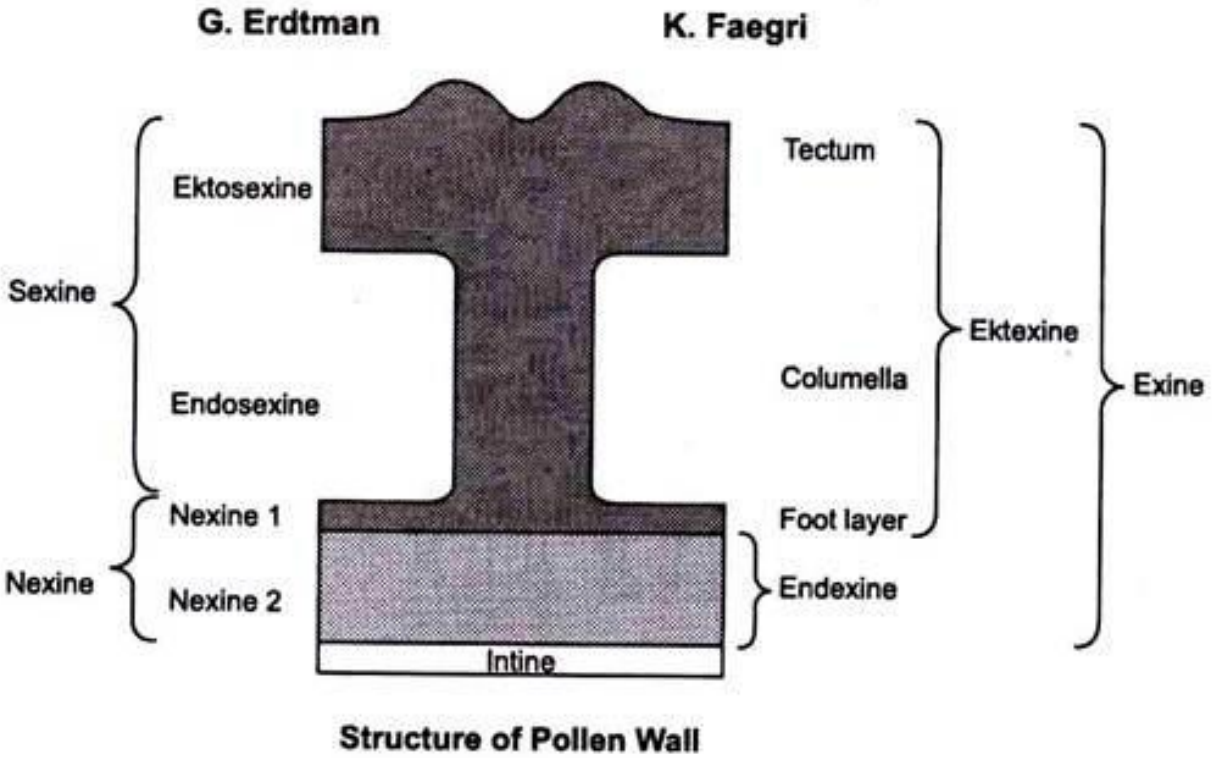
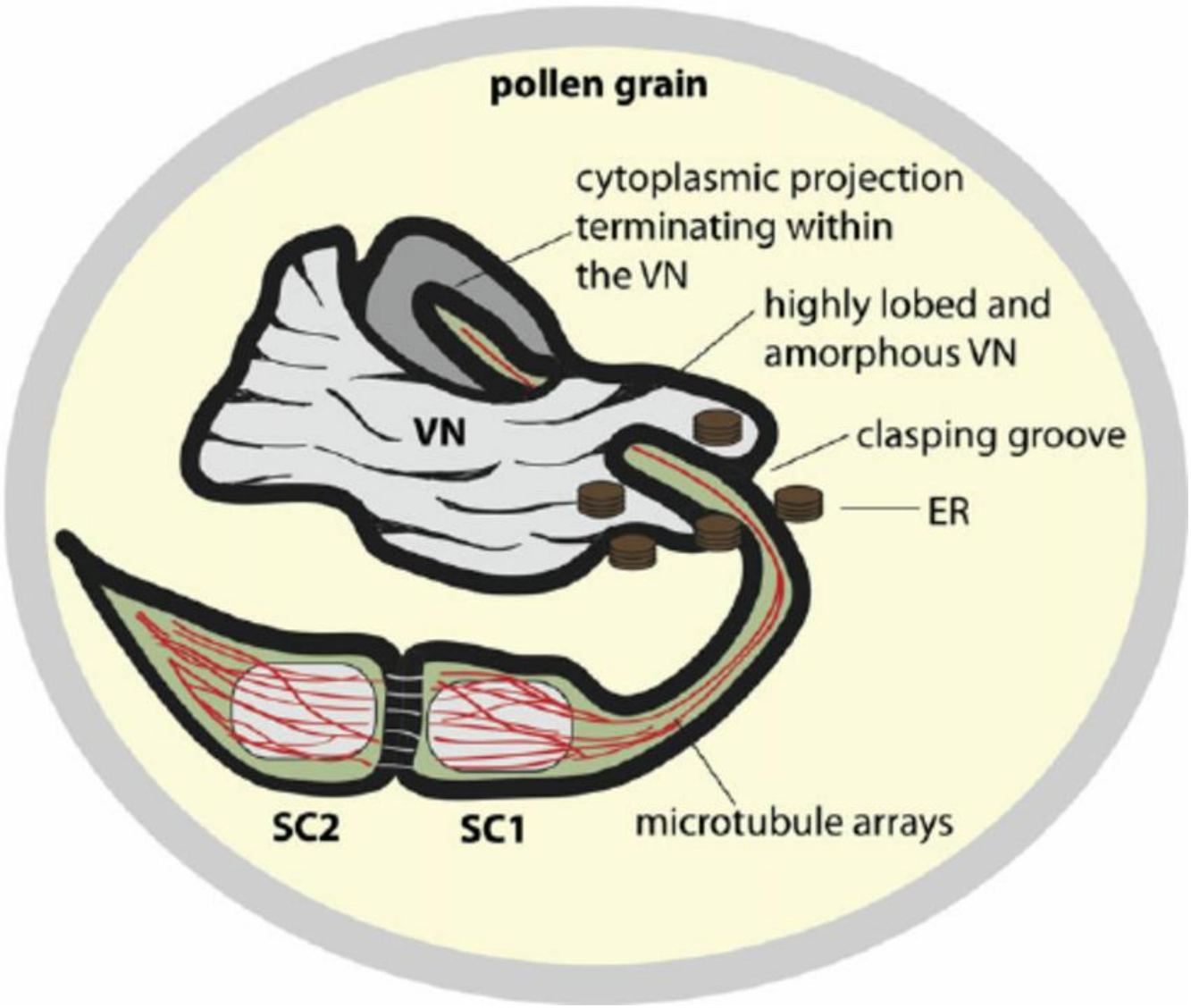


Fig. 4.14 : Sporoderm stratification


pollen grain
cytoplasmic projection terminating within the VN
highly lobed and amorphous VN
VN
clasping groove
ER
SC2
SC1
microtubule arrays

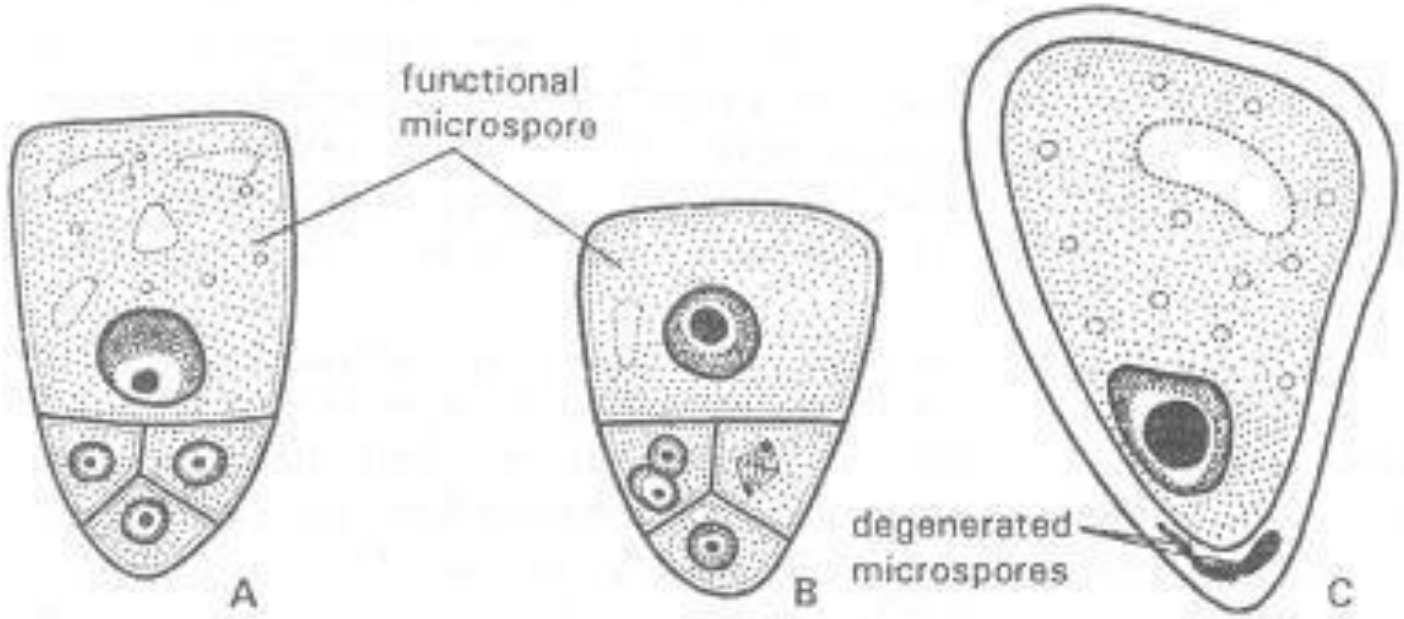


Fig. 4.14 Pollen development in *Cyperus*. **A**. The non-functional microspores have been cut-off on one side. The functional microspore is large and contains a prominent nucleus. **B**. Two of the non-functional spore nuclei have divided. **C**. The non-functional microspores have degenerated. (*after* Khanna, 1965)