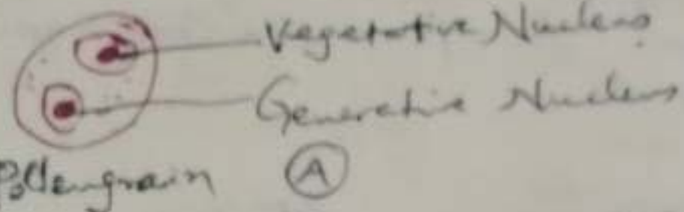
2. Nemec (1898) reported embryosac like pollen grain in Hyacinthus orientalis. He thought that this is due to result of a degeneration of the generative Nucleus & division of vegetative Nucleus. Dernd (1923) called it Nemec phenomenon & reported it in another variety of hyacinthus orientalis. Similar types of embryosac like pollen grain is reported in the anther of a variety called 'La Victor'.



Pollen Embryosac

Embryosac like pollen grain
A. Young pollen
B. Mature Pollen

(2)

Cell is rich in RNA & Possess normal staing Cytoplasm. Both of the Nuclei have dissimilar Cytoplasmic Surroundig differ each other morphologically and physiologically. photometric measurements have shown that DNA Contents are originally Similar in both nuclei Lison (1951) state that even in Telophase the DNA Contents is twice as large in the generative Nucleus as in the vegetative. The main increase in DNA occurs in the generative Nucleus during late interphase Generative Cell Stains much because of its higher DNA Contents.

The Dehiscence of Anther takes place usually when the Pollen grains are bicelled in most of cases but in few cases the pollengrains are shed at 3 celled stage as in Brassicaoleraceae The Cell wall between the two disappears and the Naked generative Comes to lie freely in the Cytoplasm of vegetative Cells. It is usually in this two celled Condition that microspore is shed from pollen Sac for pollination. The Naked generative Cell divides into 2 Male gamets or Sperms. In Considerable no of cases this division also occurs while the micospores is still within its Sporangium and the pollen grains is shed in this stage but in majority of cases the microspore is in 2 Celled stage shed & its further germination takes place on Stigma.

When the pollen grain is on Stigma the intine grows out through a germ-pore into Slender pollen-tube. The pollen tube grows down through stigma and Style & enters the ovarian Cavity. Its growth first stimulated perhaps by Certain Sugary substances Secreted by Stigma and therefore, is an example of Chemotaxis. As the Pollen-tube grows the Protoplasmic Contents of the microspore pass out into it and Collect near its tip. The Generative Cell then divides into two Male gamets. Each Male gamete Consists of a Nucleus Surrounded by a thin sheath of Cytoplasm. The Male gametes have

(13)

variable shape, may be spherical lenticular or curved etc. As a rule one pollen-tube arises from a microspore but in few cases more than one pollen-tube is formed. In primitive angiosperms the pollen-tubes are often branched like a fungus hyphae.

Early workers stated that vegetative nucleus has an important role in directing the growth of pollen-tube. Present evidences seems to indicate, that its functional importance had been greatly exaggerated. The vegetative nucleus is not always in the distal end of the pollentube but frequently lies considerably behind the male gametes. According to B. Vazarat (1958) the chief role of vegetative nucleus in the accumulation of Nucleoplasm in first stage & its discharge in second phase.

On the basis of Present observation it has been regarded that vegetative Nucleus is a vestigial structure without any important function in the growth of pollen-tube.

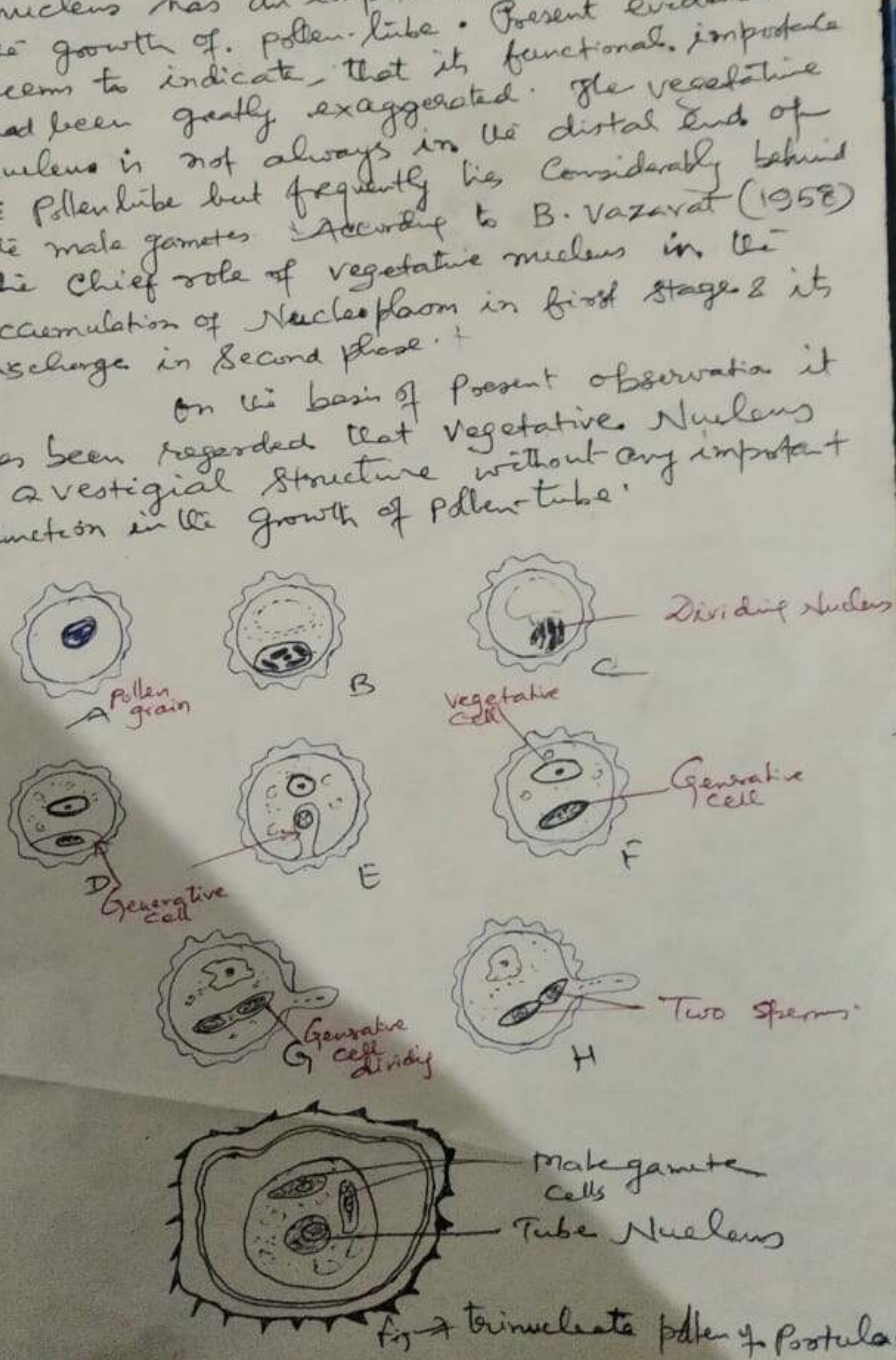
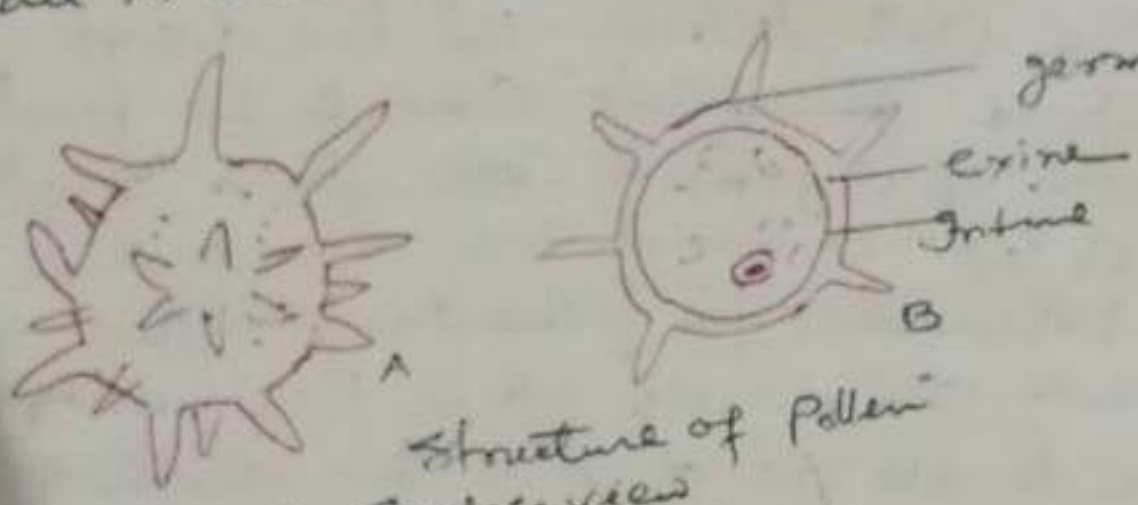


Fig → trinucleate pollen of Portulaca

MALE GAMETOPHYTE (1)

The Microspore or Pollen grain are Uninucleate cell with a cell wall of two layers The Inner layer is thin & made up of Cellulose and known as intine The outer is tough, Cuticularised and often beset with spinous outgrowths and is known as exine. At certain places the exine is very thin or missing and these places are known as germ pores. An elongated germpore is called as Germinal Pores. An elongated germpore is Called germinal furrow. In Dicots there are usually 3 germpores and in monocots there is only one germinal Pore.

In few exceptional cases the Pollen grain wall may be one layered & they e.g. orchidaceae & Naiadaceae. In Case of Allium e.t.c. the one layer of Wall is thick.



Structure of Pollen
A. Surface view
B - Sectional view

Formation of vegetative & Generative cells

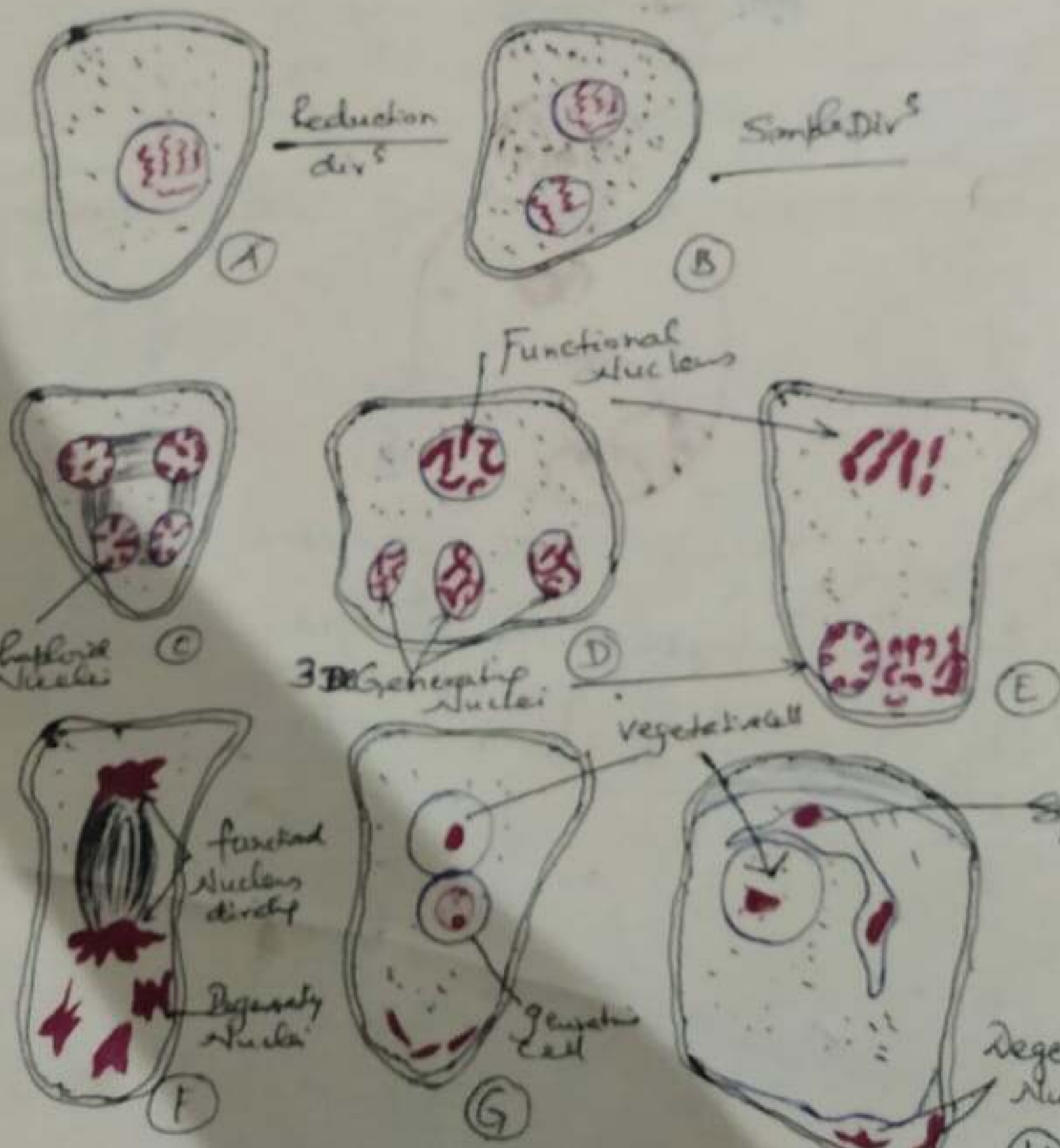
The first div^{s} of microspore gives rise to the vegetative & generative cells. Prior to the first div^{s} in pollen grain the DNA Contents of Pollen grain Nucleus increases and the the microspore Nucleus divides mitotically to produce a bigger vegetative & a Smaller generative cell. The vegetative nucleus remains in the Centre while the generative cell moves towards the periphery. Later on, a wall separates the two unequal nuclei At the maturity of Pollen grains.

Nucleus of microspore is quantitatively as well as qualitatively different. The generative or spermiogenic cell often appears hyaline & Contains almost no RNA while the generative of Siphonogamic

(5)

Abnormal Life of Male gametophyte

1. In the members of Cyperaceae the special type of pollen tube is observed.
2. Guel (1900), Stout, (1912) reported that in the various members of family Cyperaceae the primary microspore mother cell first divides by reductional div^{n} & then followed by a simple division to form 4 free nuclei which are haploid. Out of these 4 microspore nuclei only one develops further while rest 3 get pushed towards one end. The functional nucleus finally divides and result in the formation of a vegetative & a generative nucleus. The generative cell again divides to form 2 sperms.



Development of Male gametophyte in family Cyperaceae.