Gametogenesis

It is the formation of gamete male (microgametogenesis) and gamete female (megagametogenesis) in reproductive part.

1. POLLEN GRAIN

A. Definition

Pollen grain is a tiny substance produced by flowers. These grains can have various shapes. They produce and contain male reproductive cells, and enable their movement.

B. Formation of pollen grain

In the flower, the stamen is the male reproductive organ that synthesizes the pollen seed. It consists of a net that supports an anther. The anther is composed of two parts (right and left). Each part contains two pollen sacs.

The pollen sac contains the diploid pollen mother cell (2n) (microsporocytes) responsible for pollen seed formation. The microsporocytes undergo two meiotic divisions (meiosis 1 and 2) and give rise to four haploid cells (n) (microspores). Then, each microspore cell undergoes a mitotic division, resulting in the formation of two cells: a large vegetative cell and a generative (reproductive) cell, which is located inside the vegetative cell. After maturation, a pollen seed is formed, with two walls (outer wall (exine) and inner wall (intine)) that enclose the vegetative cell and the generative cell (located inside the vegetative cell).

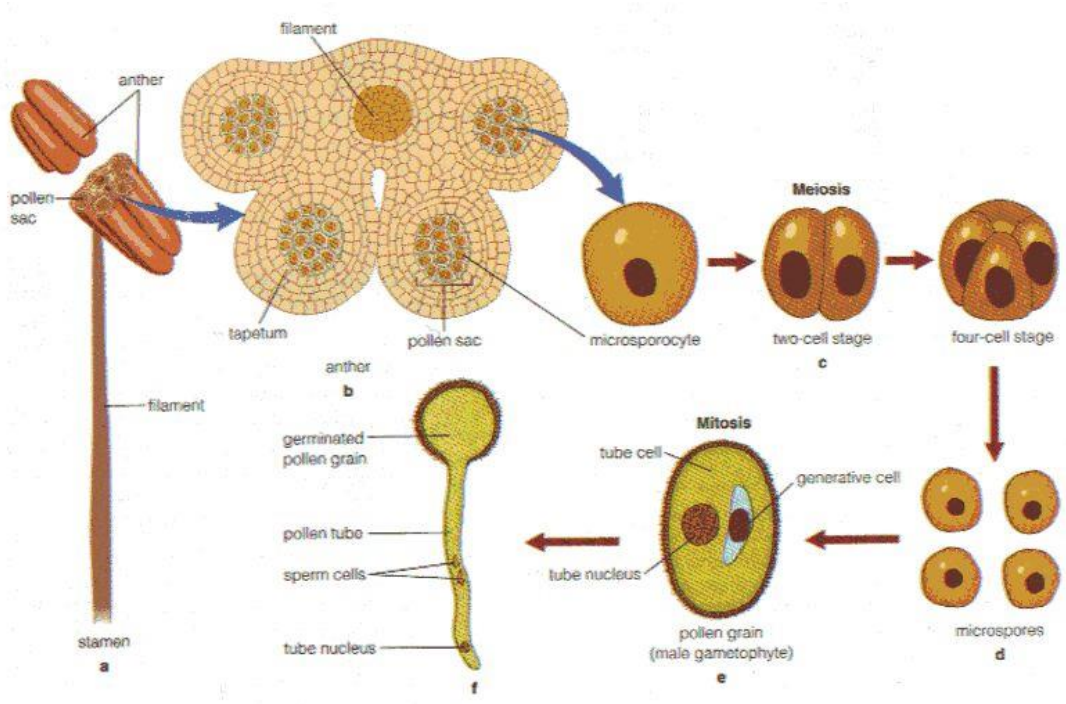

Fig.1: formation of pollen grain. https://onlinesciencenotes.com/wp-content/uploads/2021/05/pollen-grain-formatioon.jpg

2. FORMATION OF FEMALE GAMETE

Gynoecium (pistil) is the female part of the flower with stigma, style and ovary as its parts. Ovary contains ovule (megasporangium) with embryosac surrounded by two layers of integuments. In the embryosac female gametes are formed by megasporogenesis and megagametogenesis in the nucellus.

- **Megasporogenesis:**

A diploid nucellus cell differentiates into sporogenous cell towards micropylar end with nutrients from other nucellus tissues. It works as Megaspore mother cell. Megaspore mother cell undergoes meiosis (reduction) cell division to form four haploid cells. Each haploid cell is considered as Megaspore. Out of four megaspores, three are degenerated only one remains functional.

- **Megagametogenesis:**

The functional megaspore develops into female gametophyte by three mitotic (equational) cell divisions. By first mitotic cell division two, by second four and by third eight haploid nuclei are formed. These eight archisporium haploid cells are arranged in three- two- three fashion in the embryo sac, all surrounded by nucellus. Three towards chalaza end are termed as Antipodal, two at the centre as Polar nuclei whereas out of three arranged at the micropylar end, the one present in the middle is termed as egg cell and remaining two as synergids. The nucellus (plural: nucelli) is the central portion of the ovule inside the integuments. It consists of diploid maternal tissue and has the function of a mega sporangium. All the eight mega gametes have same genetic constitution as they all originated from one spore by mitotic cell division. Haploid cells found by Meiosis are considered as spore. All the four spores formed by one mega mother cell have different genetic constitution. Gametes are found by mitotic cell division in micro or megaspore i.e., of haploid chromosome number. All the gametes formed by one spore have same genetic constitution.

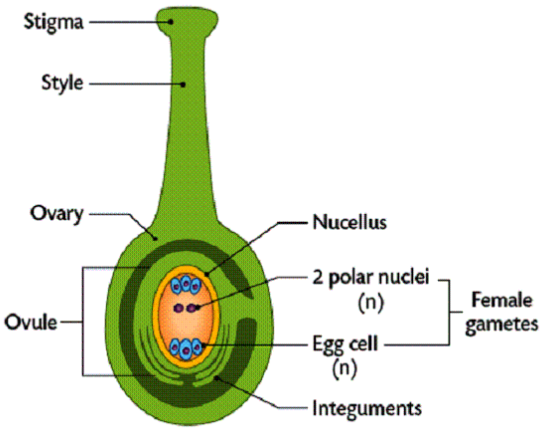

Fig.2. ovary and ovule. https://2e6746d0b4.cbaul-cdnwnd.com/ee7fee64297aa800b96eb042c0d980b8/200000134-39e1c3a605/femalr%20gamete%20formation.gif

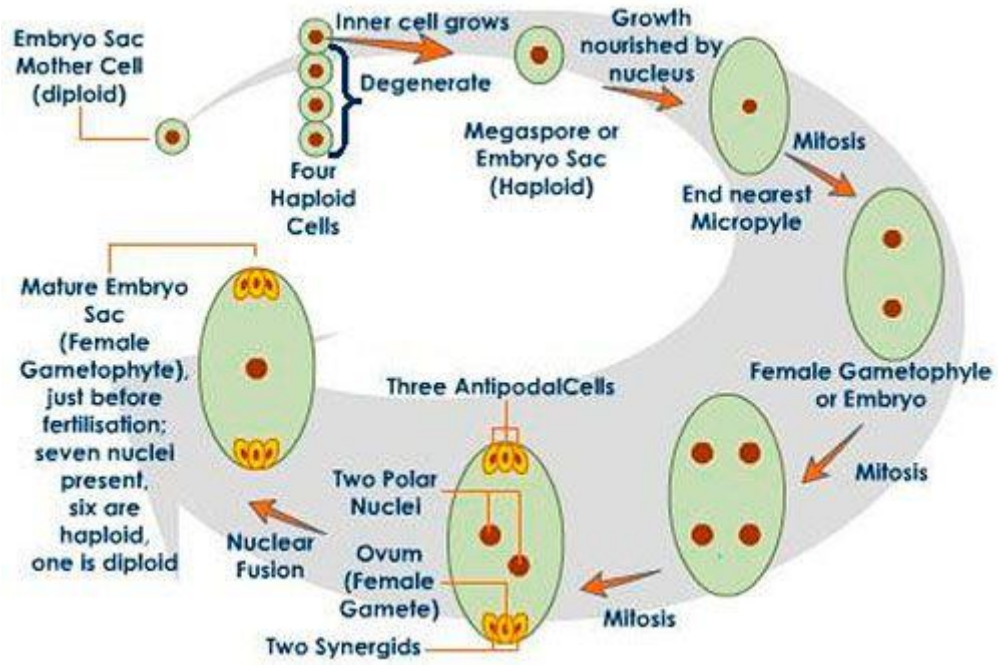

Fig. 3. Formation of female gamete.

https://i.pinimg.com/564x/37/70/34/377034ed0c9023b0783d4c16f94e8e7e.jpg

3. THE POLLINATION

It is the transport of pollen from the organs to reproduce the files in the organs Reproduction of females, the plants on the flowers. This transport can be used in different ways: by the vent, by the animals (tels of the insects) or by other people. The plant parts and flowers are incapable of former grains and fruits in the absence of Pollination, this souligne son of importance in agriculture.

Types of pollination:

The pollen transport can be used:

- Enter the reproduction organs of a mother's fleur
- There are different types of flowers on the same plant
- Different types of plant flours