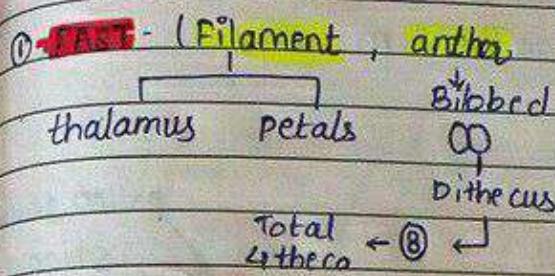


SEXUAL REPRODUCTION IN FLOWERING PLANTS



ST - Stamen
(Androecium)

② **GYNOCIUM** (Stigma, style, ovary) gynoecium / Pistil

Microsporangium - immature stage

mature stage - **Pollen grain**

pollens

① Epidermis (Flat cells)

② Endothecium (radially arranged cells)

③ Middle layers

(3-4 layers of Parenchyma tissues)

④ Tapetum - Pyramidal

Epidermis, endothecium, middle layers - Protection in direct contact in

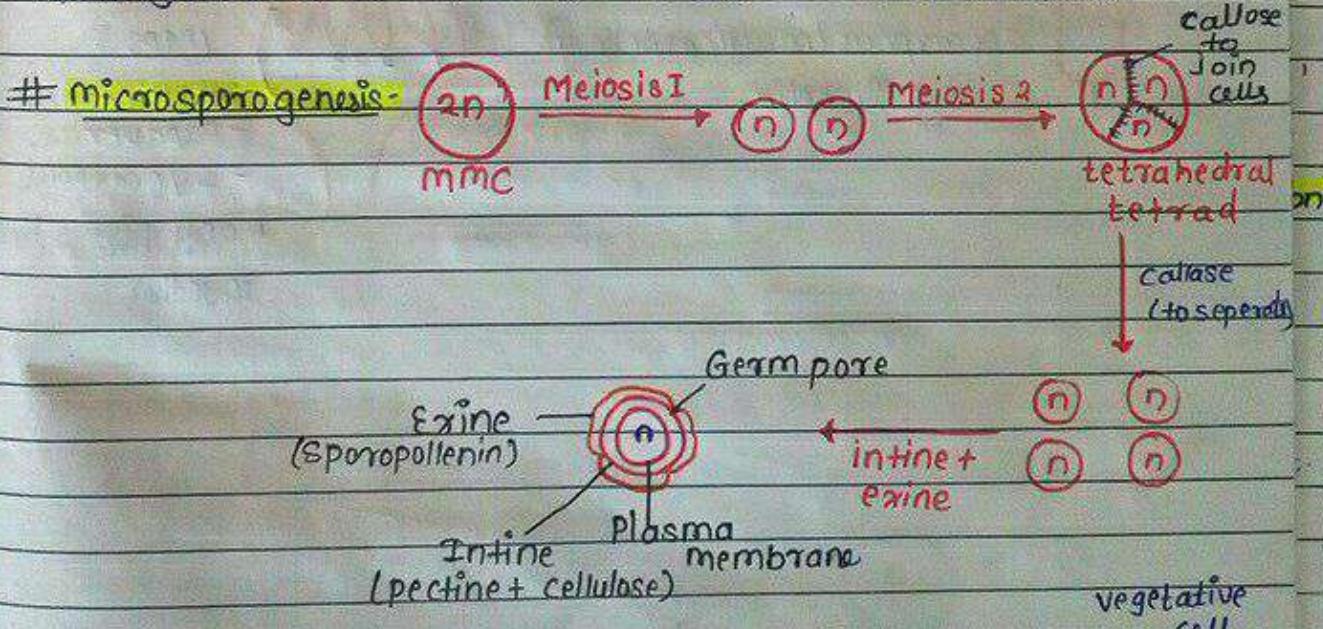
MMC

Tapetum - nourishment

- sporopollenin

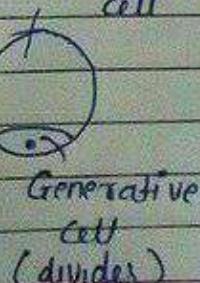
- callase enzyme

Sporogenous tissue → MMC → Pollen → ♂ gametophyte.



60% angiosperms dehiscence at 2-celled stage

40% angiosperms dehiscence at 3-celled stage



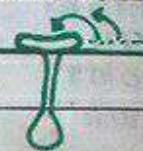
Types of Pollinating Agents

Date: _____
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Abiotic

① Anemophily (by wind)

- Pollen - light weight, and non-sticky
 - stigma - feathery
- Eg. corn cob grasses



② Hydrophily - (by water)

- mucilaginous covering
 - Ribbon-like
- Eg. Vallisneria, sea grass

common in algae,
Bryophytes & Pteridophytes.

Biotic

① Entomophily (by insects)

- colour attractive, fragrance rich in nectar.
- they too give rewards to Pollinators.

Eg. Amorphophallus

② Ornithophily - (by birds)

Bombax, Bauhinia.

③ Chiropterophily - (by bats)

④ Mollisophily - (by snails & slugs)

Eg. aroids

⑤ Hemisophily - (by ants)

Eg. rubiaceae.

Inbreeding and outbreeding Devices

Inbreeding - single plant

autogamy → self-pollination → No genetic variability

Inbreeding depression

Outbreeding - cross pollination

Unisexuality - maize, cucurbita and castor

♂ in one plant ♀ in one plant

Incompatibility - non-fertilizing effect on same flower

- Passiflora, Potato

dichogamy - asynchronous

Eg. China rose, Lady finger.

Types of Seeds

ex albuminous	albuminous
no endosperm	endosperm persist
Pea, Bean, Groundnut	(Coconut, castor, wheat)
PUBG :-	

② Embryo Development - Embryonal axis and cotyledons

DICOTS

- 2 cotyledon
 - endosperm absent
 - No protective covering
-

MONOCOTS

- 1 cotyledon
 - endosperm present
 - protective covering present
 - stem tip coleoptile/plumule
 - # undifferentiated (coleorhiza) layer
-

③ Ovule Maturation - seeds are final product of fertilized ovule

True Fruit → from ovary → Fruit

False Fruit → other than ovary → Fruit

e.g. (apple, strawberry, cashewnuts)

Thalamus

• Parthenocarpic Fruit - when fruit develops without fertilization

e.g. Banana

- by injecting growth hormone

• Apolinaria - when seed developed without fertilization of ovule.

Fruit develops from unfertilized ovule are apomictic fruit.

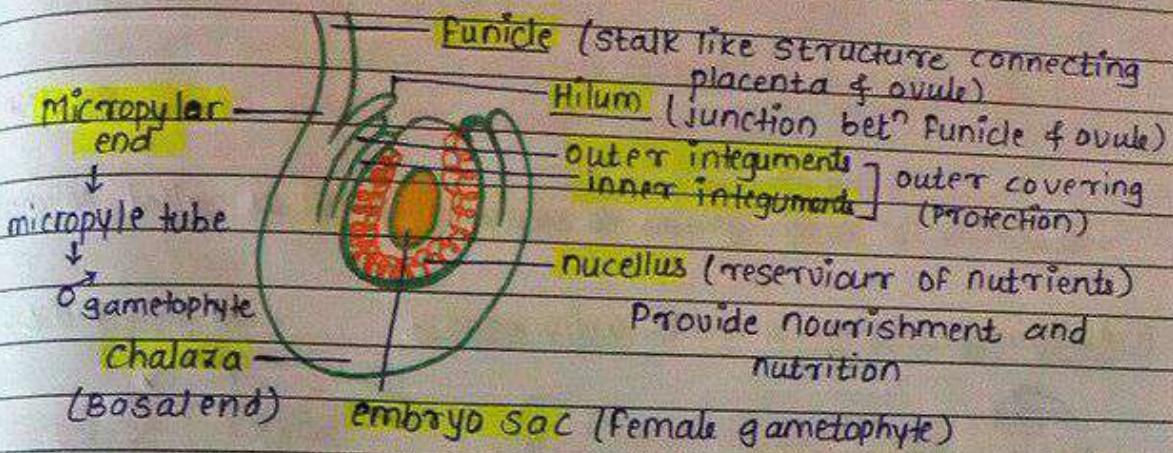
e.g. Mango

• Polyembryony - Presence of more than one embryo.

e.g. Mango, citrus, onion.

B

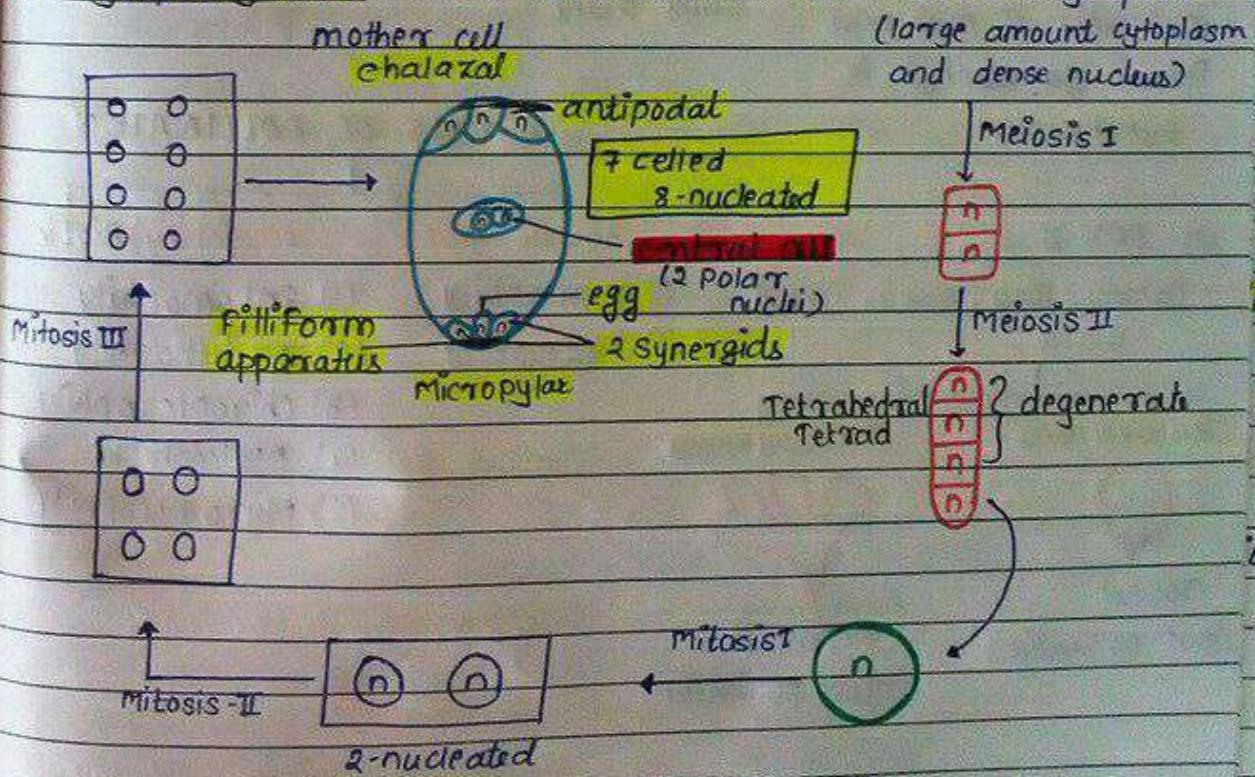
Structure of ovule - anatropous (ovule - 180°)



ovarian cavity with 1 ovule - wheat, Paddy, Mango
(Roti, kapda, Makan) :-

ovarian cavity with many ovules - Papaya, orchids, watermelon
(POW) :-

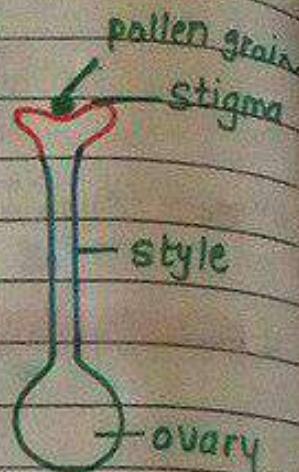
Megasporogenesis - ovule differentiates and forms Megaspore



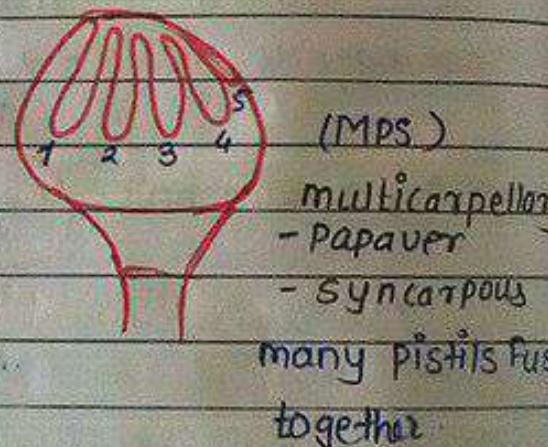
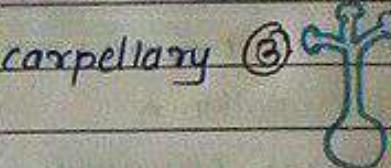
- Viability of Pollen - Solennaceae (about months) and few days.
- Allergy - carpet grass and parthenium

Megasporangium-

gynoecium - ♀
 ↓
 Pistil - S.O.S → style
 stigma ← connects ovary to
 allows ovary
 Landing of Pollen (ovarian cavity)
 grains.
 - locate
 ↓
 Placenta
 ↓
 gives rise to ovule
 megasporangium



types of pistils - single pistil - monocarpellary ③



• Pollination - ♀ gametophyte - embryo sac

♂ gametophyte - Pollen grains

Non-Motile → This needs POLLINATION

• transfer of pollen grains to stigma of pistil is called pollination

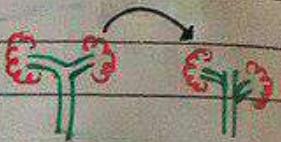
① Autogamy



② Geitonogamy



③ xenogamy



- (within the same flower (transfer betn Pistil and Stamen) anther of one flower to the stigma of other flower of the same plant)
- stamen and pistil in close contact
- closed flower
- maturation of male and female gametophyte is synchronous.

AGENTS OF POLLINATION

COV :

• Commelinaceae, oxalis and viola

electrogamous



Closed

(self-pollination)

chasmogamous



Exposed
(close pollination)

Abiotic (Rare)

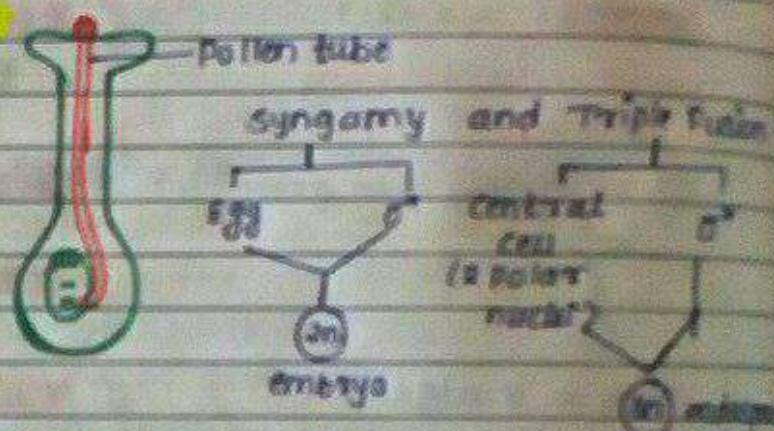
- ① Anemophily
- ② hydrophily

(majority) Biotic

- (1) Entomophily
- (2) ornithophily
- (3) chiropterophily
- (4) Malcophily
- (5) myrmecophily

- Hermaphrodite - anther and stigma at different places**
- Artificial Hybridization - emasculation and pollination (removal of anthers and stamens)**
- Pollen Pistil Interaction - ability of pistil to recognize the pollen of same species (undergoes pollination (post) events)**
 - wrong pollen grains - rejected by pistil
 - acceptance and rejection

DOUBLE FERTILIZATION



POST-FERTILIZATION

- (after fertilization)

② Endosperm development → embryo development

nutrition

↓
ovule maturation (SEED)

↓
ovary maturation (FRUIT)

① Endosperm development - (DEN) 3n

↓

nuclear division

leads to **multiple nucleus**

→ greatly divides

↓
coconut milk

cellular

endosperm

(nutrition to developing embryo)

↓
cellular

(white kidney beans)

↓
coconut