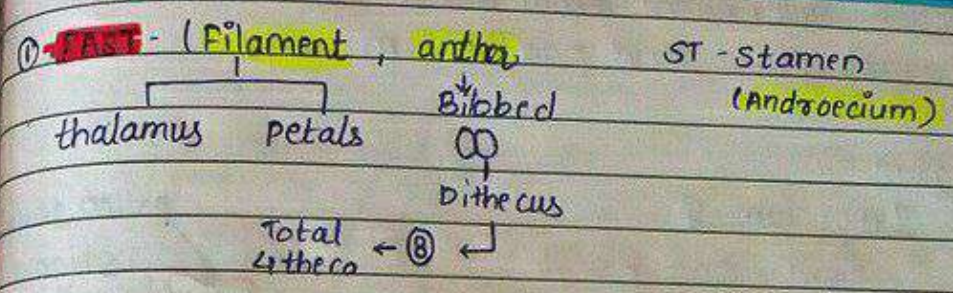


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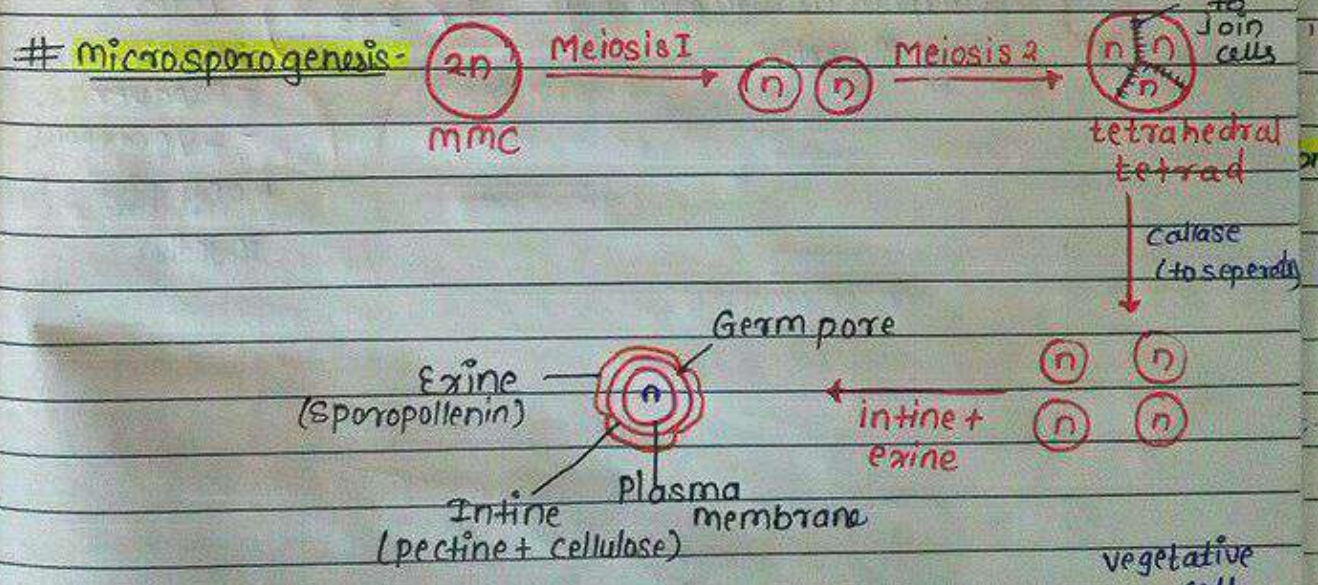
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SEXUAL REPRODUCTION IN FLOWERING PLANTS



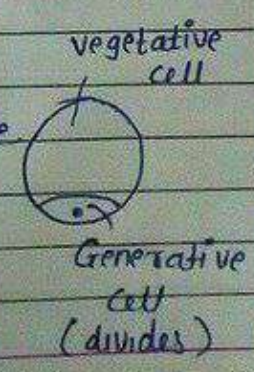
- ② **GYN** (stigma, style, ovary) gynoecium / Pistil
- # **Microsporangium** - immature stage
↓
mature stage - **Pollen Bag**
pollens
- ① Epidermis (Flat cells)
 - ② Endothecium (radially arranged cells)
 - ③ Middle layers (3-4 layers of parenchyma - hymatis tissues)
 - ④ Tapetum - Pyramidal in direct contact in MMC
- Epidermis, endothecium, middle layers - dehiscence - Protection
Tapetum - nourishment
- Sporopollenin
- callase enzyme

Sporangious tissue → MMC → Pollen → ♂ gametophyte



60% angiosperms dehiscence at 2-celled stage

40% angiosperms dehiscence at 3-celled stage



Types of Pollinating agents:

Abiotic

① Anemophily (by wind)

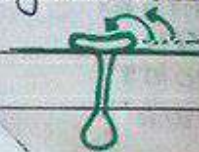
- Pollen - light weight, and non-sticky
- stigma - feathery

Eg. corn cob
grasses

② Hydrophily - (by water)

- mucilagenous covering
- Ribbon-like

Eg. Vallisneria, sea grass



common in algae,
Bryophytes & Pteridophytes.

Biotic

① Zoophilophily (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 Malacophily - (by snails & slugs)

Eg. aroids

⑤ Myrmecophily - (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

no endosperm

Pea, Bean, Groundnut

POBG 😊

albuminous

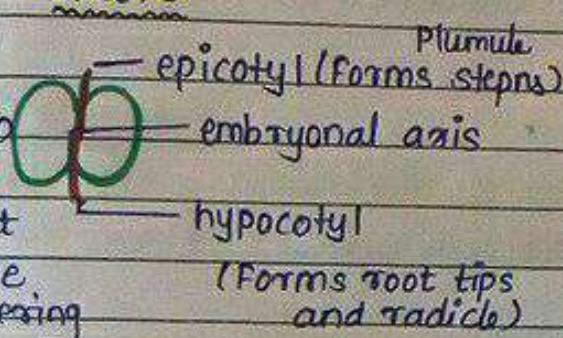
endosperm persist

(Coconut, castor, wheat)

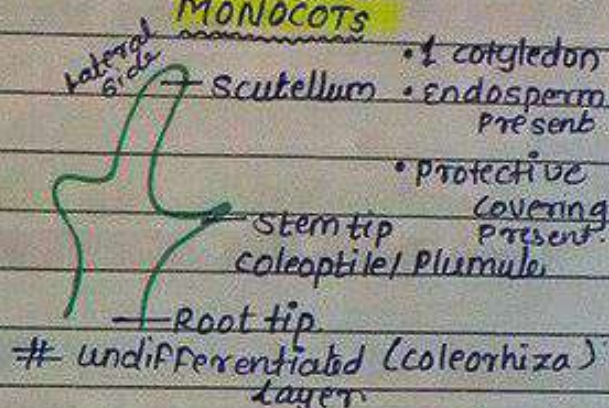
② Embryo Development

Embryonal axis and cotyledons

DICOTS



MONOCOTS



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

• **Apomixis** - when seed developed without Fertilization of ovule

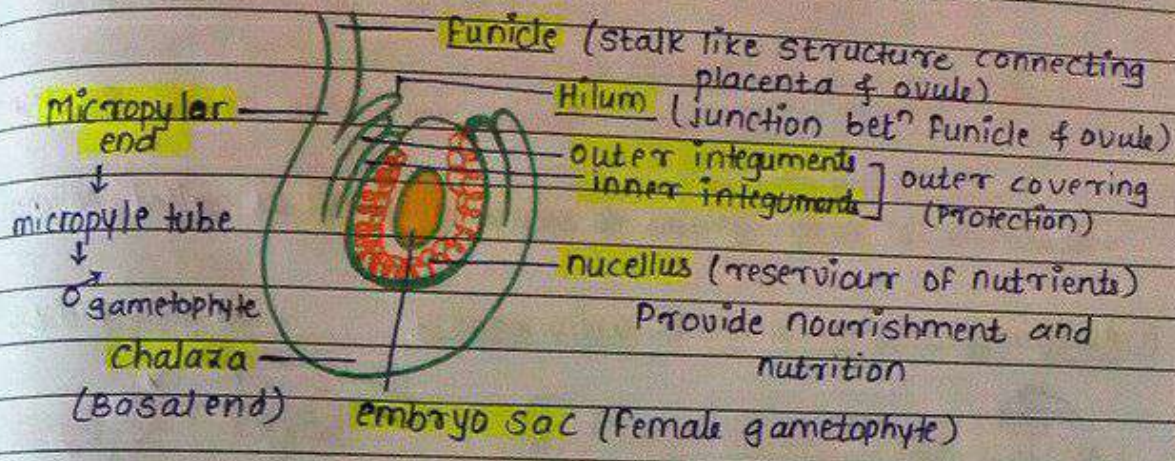
Fruit develops from unfertilized ovule are apomitic Fruit

e.g. **Mango**

• **Polyembryony** - Presence of more than one embryo

e.g. **Mango, Citrus, onion**

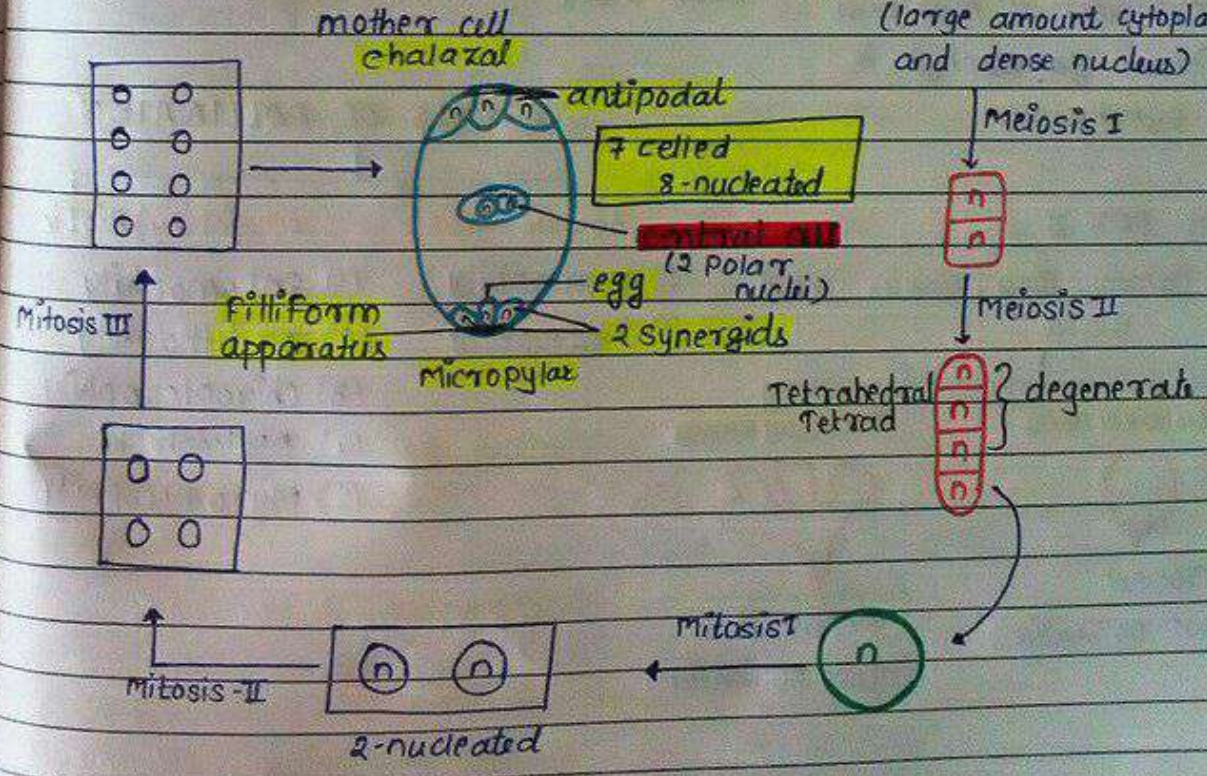
Structure of ovule - anatropous (ovule - 180°)



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

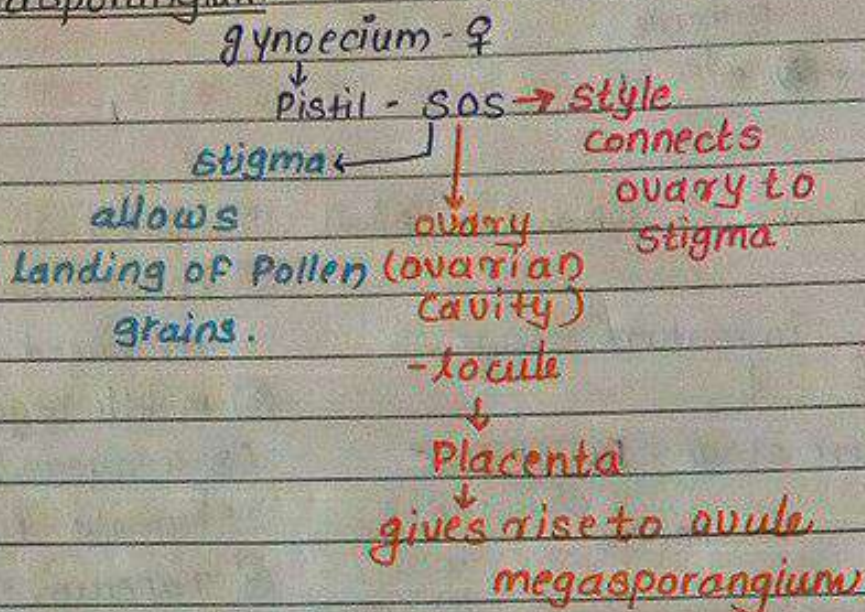
ovarian cavity with many ovules - Papaya, orchids, watermelon
(Pow) ☺

Megasporogenesis - ovule differentiates and forms Megaspore ⁽²ⁿ⁾
(large amount cytoplasm and dense nucleus)



- Viability of Pollen - Solennacea (about months) and few days.
- Allergy - carrot grass and parthenium

Megasporangium-



types of pistils - single pistil - monocarpellary ③

①



(MAM)

apocarpous (multicarpellary)
e.g. Michelia

②



(MPS)

multicarpellary
- Papaver
- syncarpous
many pistils fused together



• 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



- (within the same flower Pistil and Stamen)
- stamen and Pistil in close contact
- closed flower
- maturation of male and female gametophyte is synchronous

② Geitonogamy



- (transfer betⁿ anther of one flower to the stigma of other flower of the same plant)

③ xenogamy



- (transfer betⁿ anther of one plant to the stigma of the other plant)

AGENTS OF POLLINATION

COV ∴

- commelina, oxalis and viola

Cleistogamous



closed
(self-pollination)

chasmogamous



exposed
(cross pollination)

Abiotic (Rare)

- ① Anemophily
- ② hydrophily

(Majority) Biotic

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

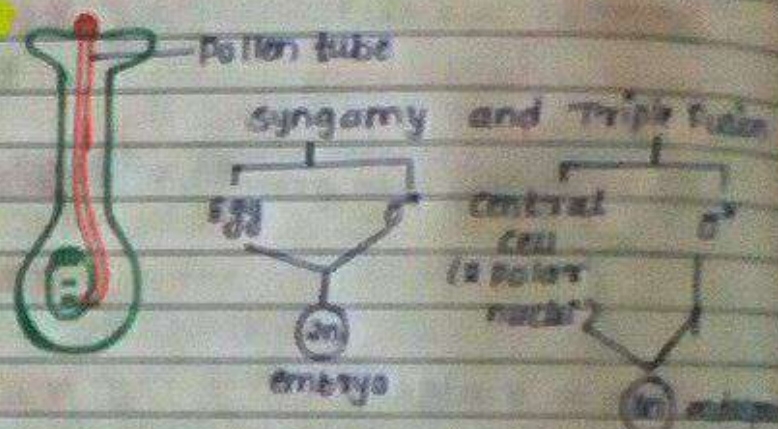
• Heterogamy - anther and stigma at different places

• Artificial Hybridization - emasculation and bagging (covering)
(removal of anther and stigma)

• 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 - (PEN) 3n

↓
nuclear division

leads to multiple nucleus

→ greatly divides →

cellular
endosperm

(nutrition to developing embryo)

coconut water

↓
cellular
(white kernel of coconut)