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(फाड़ना) FRAGMENTATION

- Some of the plants having relatively simple body ostructure can break up easily into small pieces (fragments) on maturing. These pieces or fragments can then grow and form a new plant.

- The breaking up the body of a plant into two (or more) pieces on maturing each of which subsequently grows to form a new plant is called fragmentation.

Note:- This is another method of asexual reproduction in plants.

- Green patches in ponds or lakes in stagement water bodies. The green patches growth due to the growth of plant like organism called 'algae'.

Note:- An algae reproduce by asexual reproduction called fragmentation.

∴ Spirogyra reproduces by asexual reproduction method called fragmentation.

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(Spore formation)

- Spore formation is an asexual reproductive method in plant.

Note:- Spores are the asexual reproductive bodies. Spores are not seeds.

- In spore formation method of reproduction, the parent plant produces hundreds of tiny spore in 'Spore cases'. When the spore case of the plant bursts, then the spores spread into air.

- As the spores are very light they keep floating in air and carried over large distance by air.

- Each spore is covered by a hard, protective coat to withstand unfavourable conditions such as high temperature and low humidity.

- Most of the fungi, and flowerless plants (Such as ferns and mosses) reproduce asexually by means of spores.

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(Sexual reproduction in plants)

- The plants that have flowers are called flowering plants.
- Most of the flowersing plants reproduce by sexual reproduction method involving the fusion of gametes.
- This means that two sexes (male and female) are involved in repmoduct in flowering plant.

Note:- *Flowers are the reproductive parts of plant.*

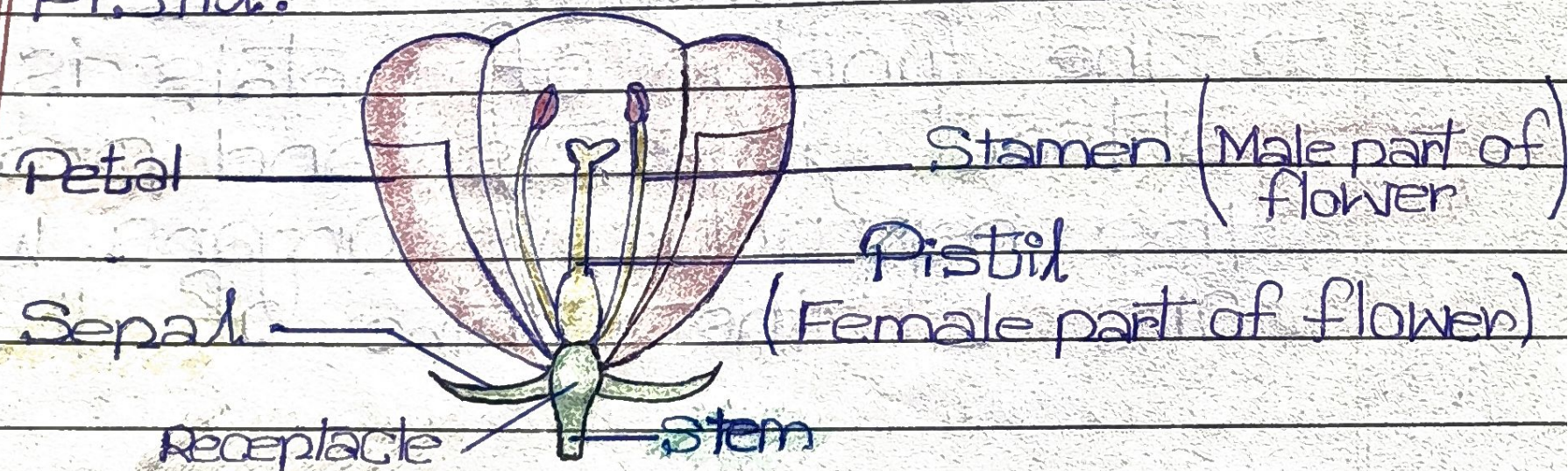
- The reproductive organs of a plant are in its flowers. Flowers contains the sexual reproductive parts of a plant.
- In most of the plants, the same flower contains the male organs as well as the female organ.
- The fusion of a flower is male is to make male and female gamets and ensure that fertilisation will take

place to make seeds for growing next plants.

- Flowers perform the function of reproduction in plants by producing seeds of the plant.
- The sexual reproduction in plants involves the fusion of male and female gamets of the plant which leads to the formation of seeds of the plant. These seeds can then used to grow new plants.

★ Structure of flowers ★

★ The main part of flowers are receptacle, Sepals, Petals, Stamen, Pistil.



1) Receptacle:- The base of a flower to which all the parts of a flower are attached is called receptacle.

2) Sepal:- The green leaf-like part in the outermost circle of a flower are called Sepals.

* All Sepal taken together are called Calyx.

→ The function of Sepals is to protect the flower in its initial stages when it is in the form of flower bud.

3) Petals:- The colourful parts of flower are called petals.

* All the petals taken together called corolla.

→ The function of petals is to attract insects and protect the reproductive organs which are at the centre of the flower.

4) Stamen: The little stalk with woolen tops just inside the ring of petals in a flower are called Stamens.

* Note:- Stamen is the male reproductive parts of the plant.

→ The stamen is made of two parts Anther and Filament.

→ The stamen stalk of a stamen is called Filament.

→ Anther makes pollen grains (परागकण) and store them.

→ Pollen grains are exposed when the anther ripens and splits.

→ Pollen grains appear to be yellow, powder-like substance.

* Pollen grains contain the male gametes of the plant.

→ Each pollen grain contain one male gamets of the plant.

→ The male gamets of the plant which is present inside a pollen grains called "male nucleus of pollen grains"

→ Pollen grains generally have a tough protective coat which prevent them for drying up.

5) Pistil (पुष्प योनि):- In the centre of a flower, there is a flask-shaped organ called pistil.

* Pistil is the female reproductive organs of the plant.
* The pistil made of three parts:-

1. Stigma 2. Style 3. Ovary

→ The top part of pistil is called Stigma. Stigma is for receiving the pollen grains from the Anther of Stamen.

→ The middle part of pistil is called Style. Style is the tube which connects Stigma to the ovary.

→ The ~~Swallow~~ Swollen part at the bottom of the pistil is called ovary. The ovary make Vacuoles and stores them. Ovule contains the female gameles of the plant.

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* A new seed of the plant is formed when the male gametes present a pollen grain unites with the female gametes present in the ovule.

→ This happens in two steps:-
① Pollination (परागन)
② Fertilisation (निषेचन)

(Pollination)

* The transfer of pollen grains from the Anther of stamen to the stigma of pistil is called pollination

→ For the male gametes to be able to combine with the female gamete, it is necessary that first the pollen grains from the anther of stamen of flower should be carried to the the stigma of pistil.

(ii) Pollination by wind.

→ The blowing wind carries pollen grains from one flower to other flowers and help in pollination.
→ Wind pollinated flowers do not have large, brightly coloured and ~~scatter~~ scented petals or nectar because they do not have to attract insect.
→ The wind pollinated flowers have anther that hang outside the flowers to catch the wind.
→ They produce large amount of light, ~~and~~ small pollen grains which can blow in the wind. Ex- grass, maize, bamboo, etc.
⇒ |

(iii) Pollination by water.

→ ~~Aequatic plants~~ The pollination in acquatic plants is done by water.
→ Pollen grains are light, they are easily carried by water from flower to flowers for pollination. Ex- Hydrilla.

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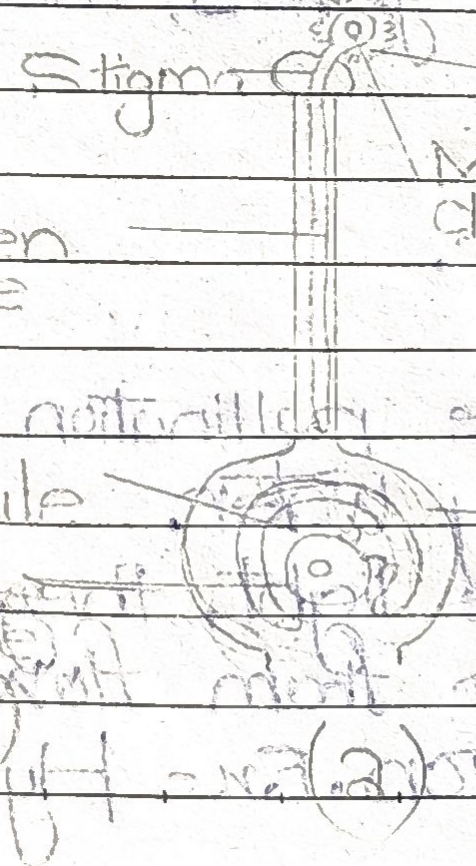
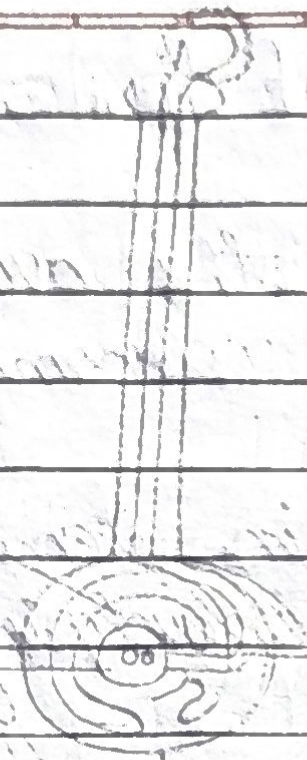
(Fertilization)

* The process in which the male gametes present in pollen grains fuses with the female gametes present in ovule from a new cell (called zygote) is called Fertilization. In other words, the fusion of male and female gametes to form zygote called Fertilization.

→ Fertilization takes place as follows:-

① When pollen grains falls on stigma of pistil, the pollen grains grows a pollen tube downwards through style towards the female gametes in the ovary.





(b)

→ The tip of the pollen tube burst, open and male gamete comes out.
→ In the ovary, the male gamete of pollen combines with the female gamete present in ovule to form a fertilized egg cell called Zygote.
→ Zygote develops into an Embryo.
→ Embryo is that part of a seed which develops into a new plant.

Pollen tube enters ovule and male gametes combines with female gamete.

Formation of fruits and seeds

→ After fertilization, the ovule present in ovary grow to become a seed.

→ The seed contain embryo (baby plant) and food for developing new plant.

→ A seed is the sexual reproductive body of a plant which can be used to grow more plants.

* All the ovules present in the ovary of a flower get fertilised by pollen grains and grow to become seeds.

→ After fertilisation, the ovary of a flower develops and becomes a fruit.

→ A fruit protect the seeds.
Ex- Apple, Mango, lemon, etc.

Note:- A pea pod is a fruit. It has seed inside it.

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(Germination) (अंकुरण)

★ The process in which a seed begins to grow is called germination.

→ When a seed germinates, the seed coat slits, a tiny root grows downward and a shoot grow upward. This produces a seedling of a plant.

→ The seedling grows further and ultimately form a new plant.

→ After a certain period, the plants bear flowers.

→ These flowers again produce fruits and seeds. Ex- wheat, gram, maize, etc.

Note:- All those seeds can germinate when sown in soil under suitable conditions to produce new plants.

(Dispersal of Seeds and Fruits)

- Dispersal of Seeds means "to scatter seeds over a wide area."

Note:- The seeds of some plants disperse as such (as seeds) but the seeds of other plants disperse in the form of fruits. So the dispersal of seeds also include the dispersal of fruits.

✱ Dispersal of Seeds and fruits ✱

✱ The same kind of plants grow at different places because their seeds are dispersed to different places by various natural agents such as wind, water and animal.

→ When the seed become mature, then the whole fruit containing seed or the indivisual seeds fall from the different parent plant to the ground below.

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* Seed dispersal ~~prev~~ is benificial to the plants because it provides the following advantages to the plants:-

1. Seed dispersal prevents the overcrowding of plants in an area.
2. Seed dispersal prevents the competition for water, minerals and sunlight among the same kind of plants.
3. Seed dispersal helps the plants to grow in new places for wider distribution.

* How seeds and fruits are dispersed?

- Seeds and fruits of the plants are carried away (or dispersed) by water, wind and animals. So, the main agents for the dispersal of seeds and fruits are wind, water and animals.

Note:- Various seeds and fruits have some special features in

them due to which they are adapted to be carried away easily by wind, water or animals.

1) Dispersal of seeds and fruits by Wind.

→ The seeds and fruits dispersed by wind either have wing-like structure or they have hair and they are very small and light, which helps them to be easily carried away by the blowing wind.

2) Dispersal of seeds and fruits by water.

→ The seeds and fruits of some plants are dispersed by water. The seeds and fruits which are dispersed by water develop floating ability in the form of spongy outer coat. The seeds of water lily plant and coconut plant are dispersed by water.

Note:- The seed of water lily plants have a spongy outer coat which allows them to float in water and move to other place along with water current.

Note:- The coconut fruits have fibrous coat which enables them to float in water and carried away by flowing water to far off places. Coconut fruits floating in sea water are carried 100 of kilometres away by the sea current for to other parts of land.

3) ★ Dispersal of seeds and fruits by animals ★

→ ~~The seeds~~ Some fruits develop hooks on their surface by which they get attached to hairy bodies of the passing animals and carried away to distant places. These fruits may be carried several kilometres by moving

animals before they rubbed off from their body by an animal.
Ex:- The fruits of Xanthium and Urena plants.

4) **Dispersal of seeds and fruits by explosion**

→ The ripe fruits of castor plant burst suddenly with a jerk and scatter the seed far away from the parent plant. Similarly, the ripe fruits of balsam plant burst suddenly with a jerk and throw their seeds far away from the parent plant.