

C.WChapter - 1Reproduction in Organisms

Reproduction → Reproduction is defined as a biological process in which an organism give rise to young ones (offspring) similar to itself.

Reproduction enables the continuity of the species, generation after generation.

There are two modes of reproduction :-

(a) Asexual reproduction

(b) Sexual reproduction

(a) Asexual reproduction → When offspring is produced by a single parent with or without the formation of gamete, then this process is called asexual reproduction.

The offspring that are produced are not only identical to one another but are also exact copies of their parent.



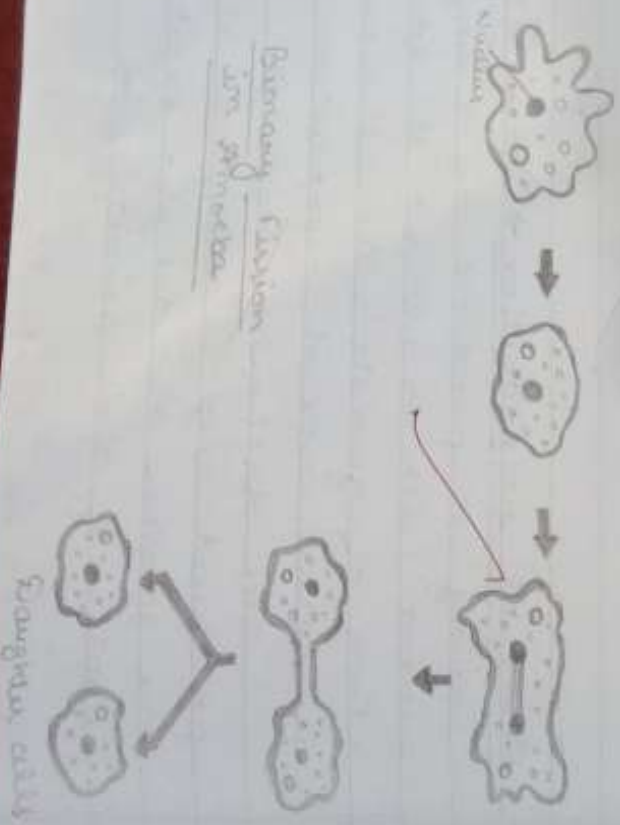
There are various modes of asexual reproduction:-

- (i) Fission
- (ii) Budding
- (iii) Fragmentation
- (iv) Vegetative propagation
- (v) Spore formation

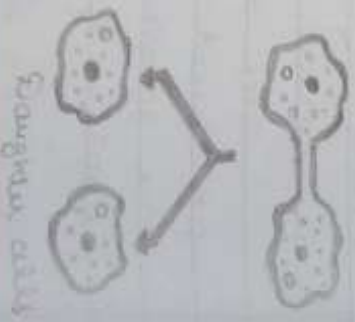
(i) Fission → It is a type of asexual reproduction in which single parent is involved.
It is of two types:-

→ Binary Fission → An asexual reproduction, where the parent organism is replaced by two daughter organisms.
ex: Bacteria, fungi etc.

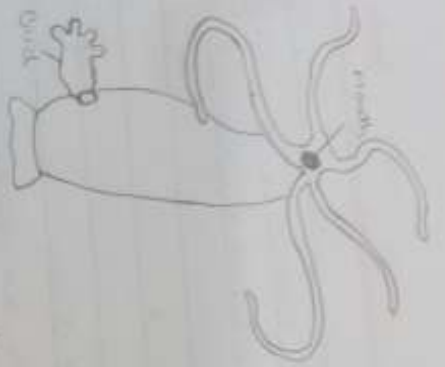
→ Multiple Fission → An asexual reproduction, where the nucleus of parent cell divides several times by mitosis, producing several nuclei. The cytoplasm then separates, creating multiple daughter cells.
ex: Sporozoans and algae.



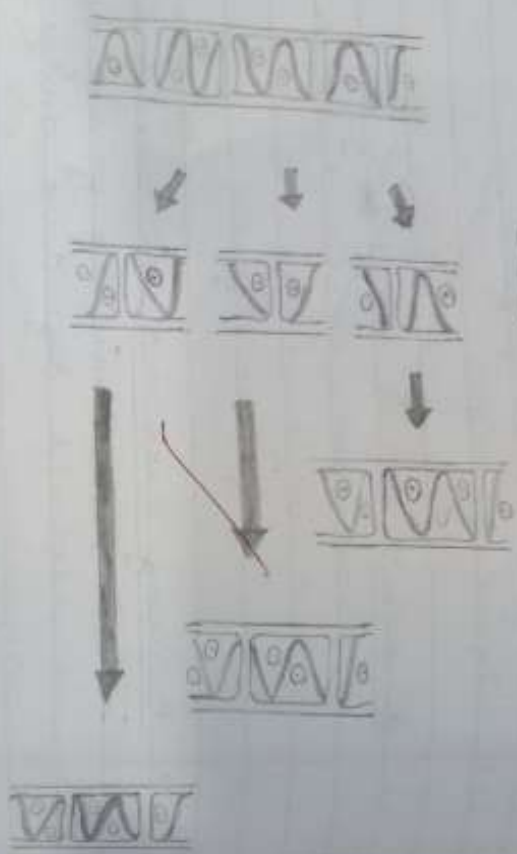
Binary fission in paramecium



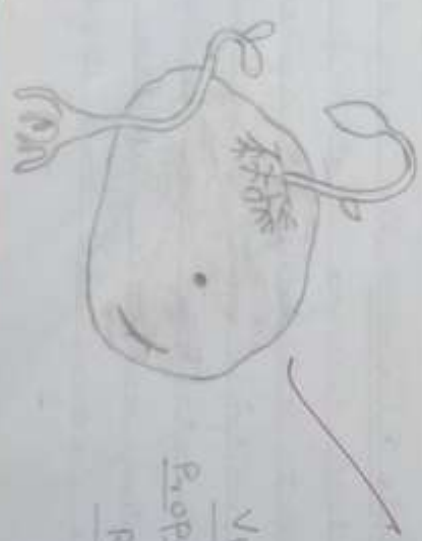
daughter cells



Budding in Hydra



Fragmentation in Spirogyra

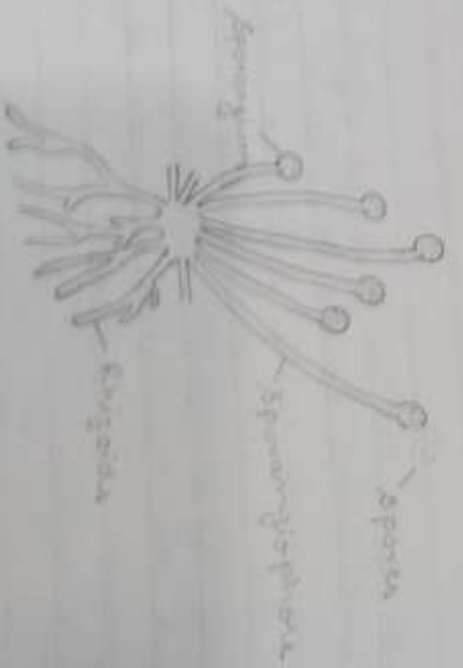


Vegetative Propagation in Rhizome

(ii) Budding - It is a type of asexual reproduction, where the buds grow into fully formed individuals which eventually break away from the parent organism and the formation of new offspring organism takes place.
Ex - Hydra

(iii) Fragmentation - Fragmentation is a form of asexual reproduction where a new organism grows from a fragment of parent. Each fragment develops into a mature, fully grown individual.
Ex - Spirogyra.

(iv) Vegetative Propagation - It is a type of asexual reproduction found in plants where new individuals are formed without the production of seeds or spores by asexually or vegetatively.
Ex - Rhizome.



Spore formation in Rhizopus

(v)

Spore Formation :- Spore formation is a type of asexual reproduction which is found in non-flowering plants in which the parent plant produces hundreds of tiny spores which can grow into new plants.

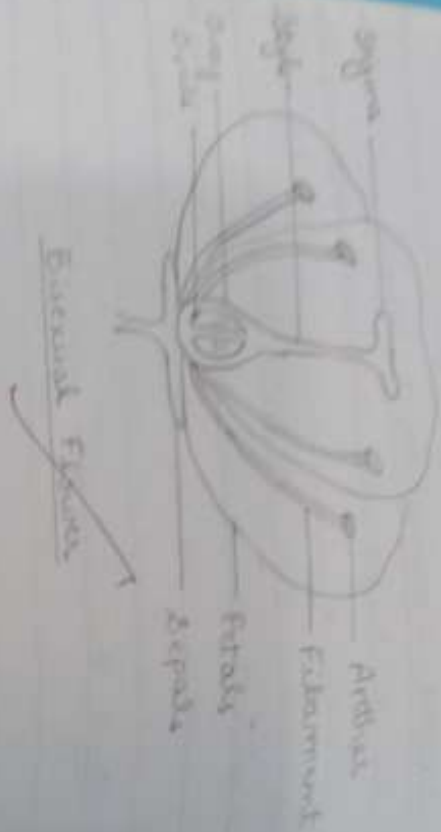
Ex:- Rhizopus

(b)

Sexual Reproduction :- It is a type of reproduction involving the formation of male and female gametes either by same individual or by different individuals of opposite sex. These gametes fuse to form the zygote which develops to form the new organism.

It is an elaborate, complex and slow process as compared to asexual reproduction. Because of fusion of male and female gametes sexual reproduction results in offspring that are not identical to the parent or amongst themselves.





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Phases in Sexual Reproduction

(a)

Juvenile phase → The period between birth and sexual maturity is called juvenile phase. In plants, it is known as vegetative phase.

(b)

Reproductive phase

- Some plants show flowering in particular season and some other flowers in all seasons.

- The female parental animals exhibit cyclic change in activities ovaries and accessory glands as well as hormones during the reproductive phase.

Menstrual cycle

- It occurs in mammals, apes and human beings.
- Cycle consists of 3 phases - menstrual phase and secondary.
- Blood flows in the last few days of the cycle.

endometrium is passed out during menstruation.

- Female does not permit copulation during menstrual phase of cycle.

Oestrous cycle

- It occurs in non-primates like cow, sheep, rat, deer, dog, tiger etc.
- It consists of a short period of oestrous or heat. It is 12-24 hrs. in cow followed by anoestrous or passive period.
- Blood does not flow in this cycle. The broken endometrium is reabsorbed.
- Female permits copulation only during oestrous period.

(c) Senescent phase →

- It is the end of reproductive phase.
- Old age ultimately leads to death.

Events in Sexual Reproduction

Pre-fertilisation, Fertilisation, Post-fertilisation are events in sexual reproduction.





Zoogametes of Chloophora



Heterogamete of Fucus

(i) Pre-fertilisation - All the events prior to fusion of gametes are included in it. It includes gametogenesis and gamete transfer.

(a) Gametogenesis - It is the process of formation of male and female gametes. Gametes are haploid cells which may be similar or dissimilar in structure. In algae, both gametes are similar in structure called homogametes. In higher organisms that reproduce sexually, two morphologically distinct gametes are formed called heterogametes.

In fungi and plants, homothallic and monocious forms are used to denote the bisexual condition and heterothallic and dioecious are used for unisexual condition. In grassy plants, the unisexual male flower is staminate, i.e., bearing stamens, while the female is pistillate or bearing pistils.



female gametes around. The no. of male gametes are much more than number of female gametes.

In higher plants pollen grains are carrier of male gametes and nuclei has eggs. Pollen grains transferred from anthers to stigma to facilitate fertilisation. The transfer of pollen grains from anthers to stigma is called pollination. It may be self or cross.

Pollen grains germinate on stigma to produce pollen tube that delivers the male gametes near the ovule.

(i) Fertilisation - The fusion of male and female gametes is called fertilisation or syngamy. It results in formation of diploid zygote.

The process of development of new organisms without fertilisation female gametes is called parthenogenesis.
Ex: honey bee, mite etc

→ External fertilisation

Hygamy occurs outside the body of the organism. Large numbers of gametes are released in surrounding medium.
Ex → Bony fishes and amphibians.

→ Internal fertilisation

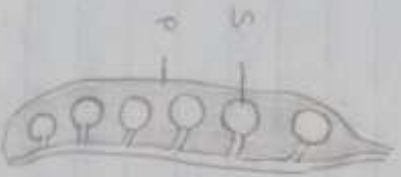
Hygamy occurs inside the body of the organism. Numbers of ova are produced are less, but large no. of male gametes are released and they travel towards the ovum.
Ex → Birds and mammals.

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Post Fertilisation Events → Events in the sexual reproduction after formation of zygote.

- In the organism showing external fertilisation, zygote is formed in external medium and there have internal fertilisation ~~zygote is formed in the body of female.~~

- In alga and fungi, zygote develop a thick wall resistant to desiccation and dormancy. This gametophyte often



Period of airt

In the organism having asexual life cycle, zygote divides to form haploid spores that germinate to form haploid individual.

Embryogenesis → the process of development of embryo from the zygote

During this, zygote undergoes multiple division and cell differentiation. Cells division increase the number and cell differentiation help information of new group of cells and organ.

Oviparous

Amphiparous

Development of zygote - its takes place out - side the body of organism and lay fertilized of multi-cell egg

Ex → reptiles and birds

Ex → human, dog, horse etc



- In flowering plants, zygote is formed inside the ovule. After fertilisation, sepals, petals and stamens of flower fall off. The zygote develops into embryo and ovules into seeds. The ovary develops into fruit which develop a thick wall called pericarp, protective in function.
- After dispersal, seeds germinate under favourable condition to produce new plants.

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