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Subject Biology

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How do Organisms Reproduce?

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Introduction

→ Reproduction is the process by which living organisms produce new individuals similar to themselves. It ensures continuity of life on earth.

→ Nucleus of the cell contains DNA (Deoxyribose Nucleic Acid) which is the heredity material.

→ DNA replicates and forms new cells causing variation. So, these new cells will be similar but may not be identical to original cell.

→ Variations are useful for the survival of the individual and species over time as well as basis for evolution.

Types of Reproduction

Asexual Reproduction

→ A single individual give rise to new individual.
→ Gametes are not formed.
→ New individual is identical to parent.
→ It is extremely useful as a means of rapid multiplication.
→ Adopted by lower organisms.

Sexual Reproduction

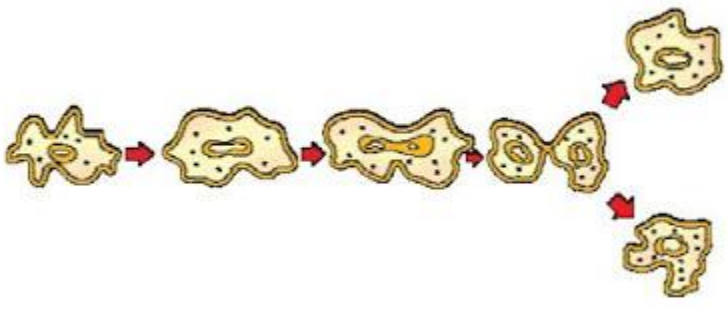
→ Two individuals i.e., one male and one female are needed to give rise to new individual.
→ Gametes are formed.
→ New individual is genetically similar but not identical to parents.
→ It is useful to generate more variations in species.
→ Adopted by higher organisms.

Modes of Asexual Reproduction

Fission

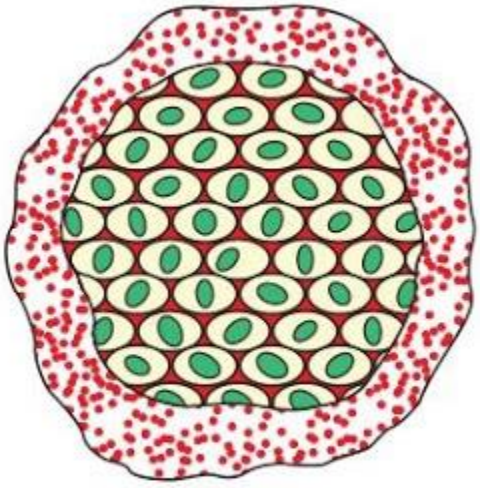
→ The parent cell divides into daughter cells.

• ***Binary fission***: 2 cells are formed. Example: amoeba.



Binary fission in Amoeba

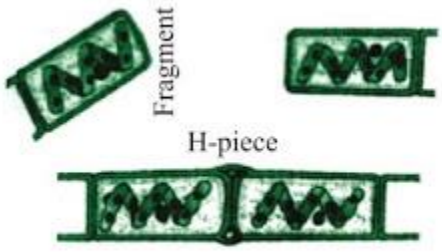
• ***Multiple fission***: Many cells are formed. Example: Plasmodium.



Multiple fission in Plasmodium

Fragmentation

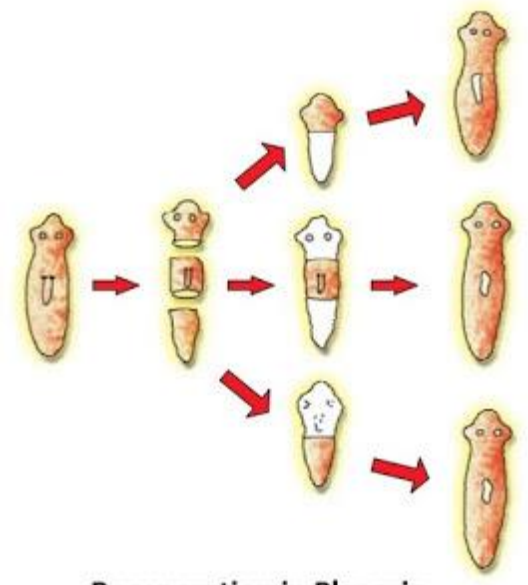
→ The organism breaks-up into smaller pieces upon maturation, each piece develops into new individual. Example: Spirogyra.



Fragmentation in Spirogyra

Regeneration

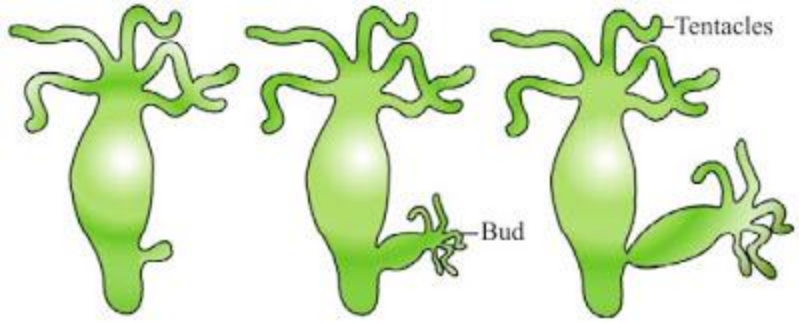
→ If organism is somehow cut or broken into many pieces, each piece grows into a complete organism. Example: Planaria, Hydra.



Regeneration in Planaria

Budding

→ A bud is formed which develops into tiny individual. It detaches from parent body upon maturation and develops into new individual. Example: Hydra



Budding in Hydra

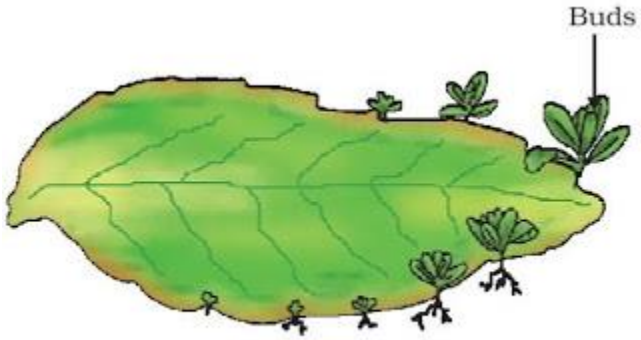
Vegetative Propagation

→ In many plants, new plants develops from vegetative parts such as:

• ***By roots***: Example: dahlias, sweet potato.

• ***By stem***: Example: potato, ginger.

• ***By leaves***: Example: bryophyllum (leaf notches bear buds which develop into plants).



Leaf of Bryophyllum with buds

Artificial methods in Vegetative Propagation

(i) Grafting: Example: Mango

(ii) Cutting: Example: Rose

(iii) Layering: Example: Jasmine

(iv) Tissue culture: New plants are grown by using growing tip of a plant.

→ These growing cells are kept in a culture medium leads to the formation of callus. Callus is then transferred to hormone medium which causes growth and differentiation.

Example: ornamental plants, orchid.