

Asexual
reproduction

Single parent gives rise
to offsprings

Morphologically and
genetically identical
offsprings

Clone

Produced by asexual
reproduction

Exact copy, which is
Morphologically and
genetically identical

Asexual reproductive
structures

Zoospores- *Chlamydomonas*

Conidia- *Penicillium*

Buds- *Hydra*

Gemmules- *Sponge*

Binary Fission

In unicellular organisms.

The cell divides to give rise to two individuals.

E.g. *Amoeba*, *Paramecium*, bacteria, etc.

Budding

Buds are produced as an outgrowth due to unequal division, which separates from the parent cell giving rise to new organisms.

E.g. Yeast, *Hydra*, etc.

Encystation

Forming a hard cyst or capsule surrounding protoplasm under unfavourable condition.

E.g. *Amoeba*, etc.

Sporulation

Liberation of spores from encapsulated cysts under favourable conditions.

Vegetative propagules

Vegetative parts of the plants, which are capable of developing into offsprings

Vegetative propagules

Bulbils- *Agave*

Leaf buds- *Bryophyllum*

Offset- Water hyacinth,
Pistia

Rhizome- Banana,
Ginger

Terror of Bengal

Water hyacinth

Sexual reproduction

Fusion of male and female gametes

Strobilanthus kunthiana

Neelakuranji

Flower once in 12 years

Reproductive cycle

Cyclic changes during reproductive phase in female placental mammals.

Oestrous cycle - non-primates

Menstrual cycle - primates

Gametogenesis

Formation of male and female gametes

Isogametes - morphologically similar gametes, e.g. *Cladophora*, etc.

Heterogametes - Distinct egg and sperm, e.g. *Fucus*, *Homo sapiens*, etc.

Monoecious or bisexual

Homothallic

Having both male and female reproductive structures in a single organism.

E.g. cucurbits, coconut, *Chara*, etc.

Heterothallic

Dioecious or unisexual

Male and female reproductive structures are present in different organisms.

E.g. Papaya, date palm, *Marchantia*, etc.

Hermaphrodite

Both male and female reproductive structures are present in an organism.

E.g. sponge, earthworm, leech, tapeworm, etc.

Meiocyte

The diploid gamete mother cell

Undergoes meiosis to form haploid gametes

Parthenogenesis

Development of new individual from the female gamete without fertilisation.

E.g. honeybees, turkey, rotifers, some lizards, etc.

Embryogenesis

Development of embryo from a zygote by mitosis cell division and cell differentiation.

Oviparous

Egg laying animals, e.g. amphibians, reptiles, birds, etc.

Viviparous

Animals giving birth to young ones, e.g. most of the mammals.

Embryogenesis in flowering plants

Zygote - Embryo

Ovary - Fruit

Ovule - Seed