

Sexual & Asexual Reproduction: Costs & Benefits

Sexual Reproduction—Costs

- * Males are unable to produce offspring.
- * Only half of each parents genome is passed onto offspring; disrupting successful genomes.

Sexual Reproduction—Benefits

The benefits outweigh the costs due to an increase in **genetic variation**.

Genetic variation provides the raw materials required for adaptation, giving sexually reproducing organisms a better chance of survival under changing selection pressures.

Red Queen Hypothesis and Sexually Reproducing Hosts

The Red Queen Hypothesis can be used to explain the persistence of the method of sexual reproduction.

Co-evolutionary interactions between parasites and hosts may select for the sexually reproducing hosts rather than the parasites.

If hosts reproduce sexually, the genetic variability in their offspring reduces the chances that all will be susceptible to infection by parasites.

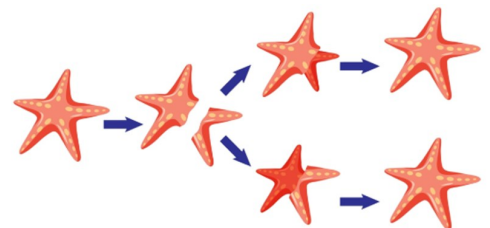


Asexual Reproduction—Costs

- * Not able to adapt easily to changes in their environment

Asexual Reproduction - Benefits

Offspring can be reproduced more often and in larger numbers.



Asexual reproduction can be a successful reproductive strategy as whole genomes are passed on from parents to offspring.

One parent can produce daughter cells and establish a colony of virtually unlimited size over time.

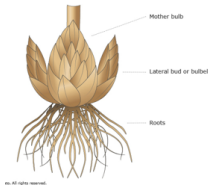
Maintaining the exact same genome as the parent is an advantage particularly in very **narrow, stable niches** or when **recolonising disturbed habitats**.

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Asexual Reproductive Methods

Vegetative Cloning

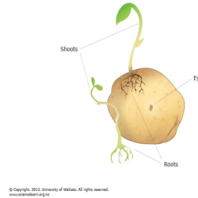
Asexual reproductive mechanism in plants.



Bulbs



Runners



Tubers

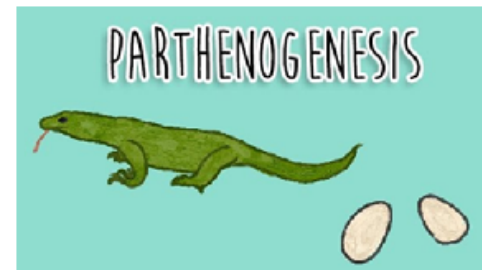
Parthenogenesis

Asexual reproduction in lower plants and animals.

This is a form of reproduction from a female gamete without fertilisation.

Parthenogenesis is more common in

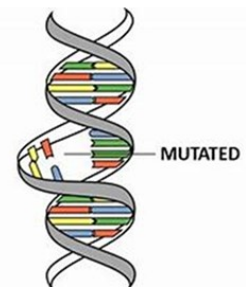
1. cooler climates
disadvantageous to parasites
2. region of low parasite density or diversity.



Mechanisms of variation in asexually reproducing organisms

1. Mutations

Only source of new alleles providing some variation to enable limited natural selection to occur.



2. Horizontal Gene Transfer

Asexual reproductive method in organisms such as Prokaryotes.

Allows a faster evolutionary change than in organisms that only use vertical transfer.

This allows variation to be increased in a population.

