

Speciation

Biology Revision Presentation

In any species there
exist groups of
individuals called

demes

Demes

breed among themselves more than with the other individual members of the population.

Speciation

is the process by which a new species with its own distinct gene pool forms.

Isolating Mechanisms

are barriers to the passage of genetic material between *demes*.

In the long term this can lead to groups so different that they can be called *separate species*.

A new species is *unable to breed with the old species*⁺.

⁺OK, so you can have hybrids which are crosses between two species - but they are sterile!

*There are a number of
different isolating
mechanisms...*

Geographic Isolation & Reproductive Isolation

Geographic Isolation occurs when a population is physically split into two or more *demes*.

A physical barrier can be anything from a *river to a mountain* and everything in between.

This kind of speciation is *allopatric speciation*, it is very likely to occur.



Reproductive isolation occurs when there are no physical barriers but two demes cannot interbreed. This form of speciation is *sympatric speciation*.

Numerous mechanisms can cause reproductive isolation.

Behavioral isolation

This occurs when animals which have elaborate courtship behaviours cannot elicit the required response in their potential partner.

*Mechanical
isolation.*

Occurs where
mating pairs are
unable to couple
successfully.

Gametic isolation.

Occurs when male or female gametes fail to survive.

e.g. Sperm death in oviducts and failure of the pollen grain to germinate.

Hybrid non-viability

Even if the two subspecies manage to reach fertilisation the embryo may still fail to develop.

This is due to chromosomes not matching up.

Offspring may be produced from cross species breeding but the offspring is likely to be sterile.

Hybrid sterility

This occurs when the number of chromosomes from each parent is different so cannot pair up during prophase 1 of meiosis. As a result meiosis does not take place and no gametes are produced making the hybrid sterile.

the
end

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