

# ECOLOGICAL SPECIATION

**There are four main categories of Speciation. The categories are:**

- 1. Allopatric Speciation**
- 2. Parapatric Speciation**
- 3. Sympatric Speciation**
- 4. Alloparapatric Speciation**

## **Allopatric Speciation:**

Allopatric speciation occurs when the new species evolves in geographic isolation from the parent species. The species range, becomes subdivided by a barrier such as a new mountain range or the change in the course of a river. Gene flow between the two subpopulations becomes impossible allowing evolution to proceed independently in each. Natural selection may favour different genotypes on either side of the barrier and random genetic drift and mutation could contribute to divergence. Over time, divergence may proceed to the point that were the two populations to meet again, they would not be able to interbreed and speciation would be complete. This form of speciation may take place most readily in small populations at the extreme edge of a species range.

## **Parapatric Speciation:**

This form of speciation occurs where the speciating populations are contiguous and hence only partially geographically isolated. They are able to cross a common boundary during the speciation process. Where a species occupies a large geographical range it may become adapted to different environmental (e.g. climatic) conditions in different parts of that range. Intermediate or hybrids, will be found but the large distances involved prevent the two types from merging completely.

## **Sympatric Speciation:**

Sympatric speciation describes a situation where there is no geographical separation between the speciating populations. All individuals are, in theory, able to meet each other during the speciation process. This model usually requires a change in host preference, food preference or habitat preference in order to prevent the new species being swamped by gene flow. Whether sympatric speciation happens at all is a contentious issue. In theory it can occur where there is a polymorphism in the population conferring adaptation to two different habitats or niches. Reproductive isolation could then arise if the two morphs had a preference for 'their' habitat. There is some evidence for this in natural populations.

## **Alloparapatric Speciation:**

It is specialised kind of speciation where differentiation in isolation takes place through barrier breakdown processes, as influenced by gradual environmental variation.