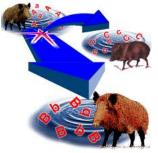
# Speciation

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# What is Speciation?



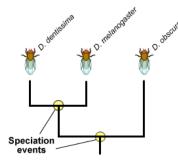
A species is a group of individuals that actually or potentially interbreed in nature. In this sense, a

species is the biggest gene pool possible under natural conditions.

The definition of a species as a group of interbreeding individuals cannot be easily applied to organisms that reproduce only or mainly asexually. Example: Bacteria which reproduces through binary fission.

The process of formation of one or more new <u>species</u> from an existing species is called speciation. It occurs when a population splits into two or more geographically isolated populations and these isolated populations divert from parent population to form new species and cannot reproduce with each other. These sub-populations become <u>reproductively isolated</u> and from new species.

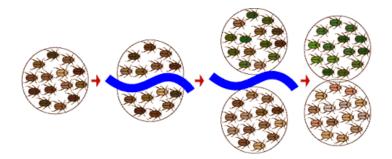
### **Definition:**



Speciation is a lineage-splitting event that produces two or more separate species.

The branching points on this partial Drosophila phylogeny represent long past speciation events.

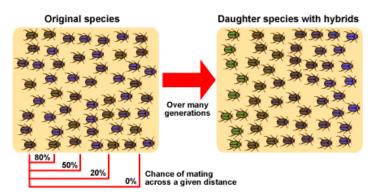
# **Causes for speciation**



Some fruit fly larvae were washed up on an island, and speciation started because populations were prevented from interbreeding

by geographic isolation.

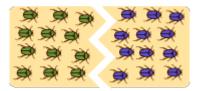
#### **Reduction of Gene Flow**



# Modes of speciation:

#### **Allopatric:**

Geographically isolated populations



#### **Peripatric:**

small population isolated at the edge



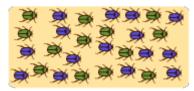
#### **Parapatric:**

continuously distributed population



#### Sympatric :

within range of ancestral population



### Beetles is the best example to understand this concept:

- Number of beetles feeding on bushes over mountain rages
- Population size increases
- (Sub populations)
- Most of the beetles feed there only --Few beetles start feeding on bushes in neighborhood
- Reproduction occurs within this sub-population. Most of the reproduction in the same area
- Migration of beetles
- Gene Flow continues
- · Large river exists in between two sub-populations
- <u>Gene flow</u> stops

After years two sub-populations get reproductively isolates bynatural selection and genetic drift form new species.

### Above example of speciation shows:

- 1. Large population of beetles occurs in mountain range.
- 2. Few beetles start feeding in neighborhood.
- 3. <u>Gene flow</u> continues in two places.
- 4. They may get isolates at larger distances because of existence of river.
- 5. Gene flow decreases finally and stops
- 6. Two subpopulations change with time because of genetic drift and <u>natural selection</u>.
- 7. Later they become reproductively isolated
- 8. Two new species come up.
- 9. This can occur as a result of change in chromosome number.
- 10. Microevolution, is very important. This means that the changes may be small but significant.

### What is the difference between natural selection and speciation:

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#### **Reference Links:**

- http://en.wikipedia.org/wiki/Evolution
- http://en.wikipedia.org/wiki/Adaptation
- http://en.wikipedia.org/wiki/Genetic\_drift
- http://en.wikipedia.org/wiki/Evidence\_of\_common\_descent
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