Founder Event Speciation
Founder Event Speciation?
A Standard View of Founder Event Speciation

1. An initially large population

2. A small group of individuals leave the large population and colonize a new area that is geographically or physically separated from the original population.

3. Due to chance alone - or to Genetic Drift - the genetic composition of the small colony differs from the large population.

4. Because of these genetic differences, the two populations are reproductively isolated when they come back into contact with one another.
This Scenario is Unlikely

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This is the problem. Chance and genetic drift really are unlikely to be powerful enough to cause reproductive isolation.
Founder Events can Dramatically Change Gene Frequencies.

Consider a founder event of two individuals (or one gravid female)

• A maximum of 4 alleles/locus are transmitted

• Most rare alleles will be lost

• An occasional rare allele will make it through

The rare allele will have a frequency of 0.25

• Standard theory suggests founder events should be relatively unimportant
Founder Flush Speciation

Mayr and Carson suggested there was more to the theory

• They had a “Wrightian” view of genetics

• Postulated that random changes in gene frequency changed the genetic environment

• Postulated that a period of relaxed selection (the “flush phase”) allowed extensive recombination

• The founder/flush process could lead to a genetic revolution.

• The genetic revolution would be the cause of speciation.
The Founder Flush process

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2. A small group of individuals leave the large population and colonize a new area that is geographically or physically separated from the original population.

3. Due to chance alone - or to Genetic Drift - the genetic composition of the small colony differs from the large population.

4. During the flush phase recombination and relaxed selection allows the formation of a new adaptive gene complex

5. Because of these genetic differences, the two populations are reproductively isolated when they come back into contact with one another.
Founder Event Controversies

Genetic Revolutions in Relation to Speciation Phenomena: The founding of New Populations


Genetic Revolutions, Founder Events, and Speciation


Carson

Templeton

Barton

Charlesworth