

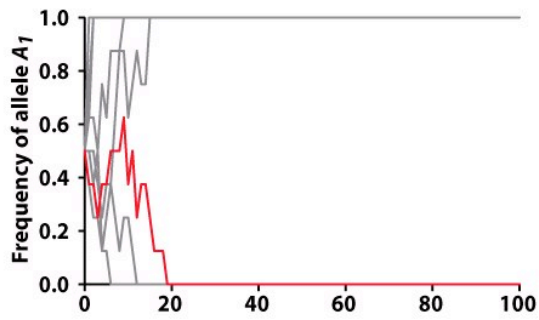
Founder Events and Genetic Drift: Pingelap Atoll,  
The Island of the Color Blind



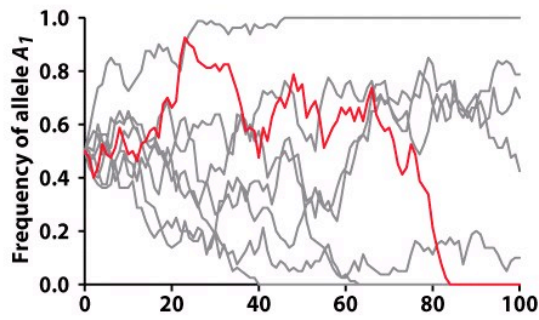
## Properties of Genetic Drift:

A (simple) model of genetic drift:

(a) Population size = 4



(b) Population size = 40



(c) Population size = 400

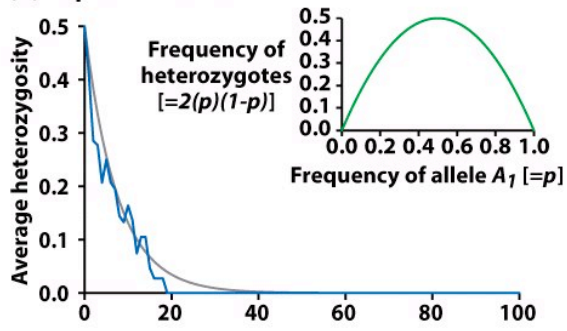


Figure 7-15 Evolutionary Analysis, 4/e  
© 2007 Pearson Prentice Hall, Inc.

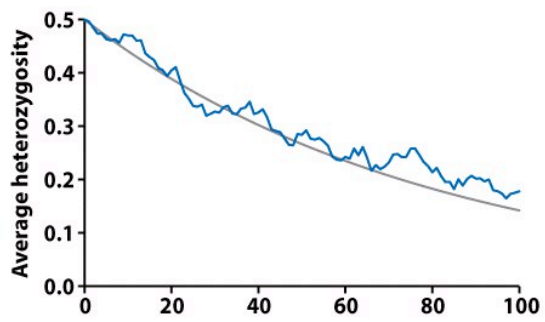
Genetic drift results in the loss of genetic variation  
(on average)

How does H decrease due to genetic drift?

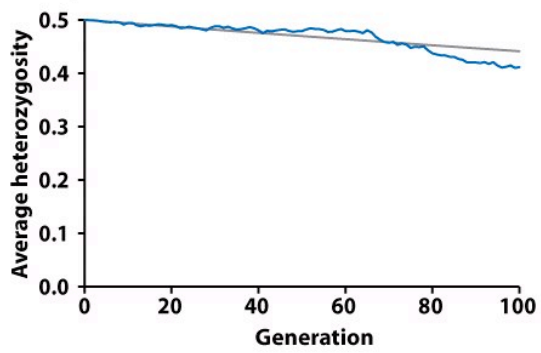
(d) Population size = 4



(e) Population size = 40



(f) Population size = 400



## Genetic drift and effective population size

## The effective population size of Pingelap Islanders

## Genetic Drift Summary

Genetic drift and mutation explains important features of molecular evolution

What is molecular evolution?

What is the rate of evolution by genetic drift?

# The Neutral Theory

## Predictions of the Neutral Theory

### Prediction #1: The Molecular Clock

Evidence that sequence evolution occurs largely independently of morphological evolution:

## Predictions of the Neutral Theory

Prediction #2: Molecular sites which are less evolutionarily constrained should evolve faster by genetic drift:

## The Nearly Neutral Model:

## Detecting Selection at the Molecular Sequence Level:

## The dN/dS ratio

Comparing the dN/dS ratio within versus between species

The M-K test can be used to estimate the proportion of genomic substitutions that are adaptive