What is Genetic Drift?

May 21, 2024 • vajiramandravi.com

About Genetic Drift:

- It is one of the basic **mechanisms of evolution.**
- It takes place **when the occurrence of variant forms of a gene**, **called alleles**, **increases and decreases by chance** over time **in a population.**
    - This occurs **due to random sampling and the random events** that influence the survival and reproduction of those individuals.
    - These variations in the presence of alleles are **measured as changes in allele frequencies.**
- **Small populations** are **more susceptible** to genetic drift than large populations, whose larger numbers can buffer the population against chance events.

- **Once it begins**, genetic drift will **continue until the involved allele** is **either lost** by a population **or until it is the only allele present** in a population at a particular locus.
- Both possibilities **decrease the genetic diversity** of a population.
- It **could also cause** initially **rare allelestobecome** much more **frequent**, and even fixed.
- Genetic drift is **common after population bottlenecks**, which are **events that** drastically **decrease the size of a population.**
    - In these cases, genetic drift can **result in the loss ofrare alleles** and **decrease the gene pool**.
- Genetic drift can **cause a new population to be genetically distinct** from its original population, which has led to the hypothesis that genetic drift plays a role in the **evolution of new species**.

Genetic Drift vs Natural Selection:

- Genetic drift is the **converse of natural selection.**
- The theory of natural selection maintains that **some individuals** in a population **have traitsthatenable them to survive and produce more offspring**, while other individuals have traits that are detrimental and may cause them to die before reproducing.
    - Over successive generations, **these selection pressures** can **change the gene pooland the traits** within the population.
    - Thus, **organisms** that are **more adapted** to their environment are **more likely to surviveand pass on the genes** that aided their success. This process **causes species to change and diverge** over time.

Unlike natural selection, **genetic drift describes the effect of chance on populations** in the **absence of** positive or negative **selection pressure.**

Q1: What is Gene?

A gene is the basic physical and functional unit of heredity. Genes are made up of DNA. Some genes act as instructions to make molecules called proteins. However, many genes do not code for proteins. In humans, genes vary in size from a few hundred DNA bases to more than 2 million bases.Every person has two copies of each gene, one inherited from each parent. Most genes are the same in all people, but a small number of genes (less than 1 percent of the total) are slightly different between people. Alleles are forms of the same gene with small differences in their sequence of DNA bases.

Source: Genetic drift, not natural selection, identified as main factor driving speciation in endangered pupfish species