



Genetic Diversity: Importance, Conversation and its Factors

Friesen James*

Department of Biological Informatics Program, University of California, California, United States

DESCRIPTION

A gene is an inheritance unit that allows generations to inherit the characteristics of their parents. It refers to the nucleotide sequence in the chromosomal DNA strands. Because these genes control the differences and similarities among different organisms, they are responsible for the expression of their distinct features. Different genes in a population are responsible for the variation among its members. Humans, for example, have a diverse set of physical characteristics that reflect their genetic diversity. Apart from genetic diversity between species, genetic diversity within species can also be observed. For example, the dog population may include various breeds of dogs.

Importance of genetic diversity

Individuals with different physical characteristics and the ability to adapt to stress, diseases, and unfavourable environmental conditions benefit from genetic diversity. Natural or anthropogenic environmental changes result in natural selection and survival of the fittest. As a result of genetic diversity, susceptible varieties die while those that can adapt to changes survive. Maintaining different varieties of genes that may be resistant to pests, diseases, or other conditions is important for a healthy population. Cross-breeding different genetic variants can result in new plant varieties with desirable traits such as disease resistance and increased tolerance to stress. The occurrence of undesirable inherited traits is reduced by genetic diversity. Genetic diversity ensures that a species has at least some survivors.

Conservation of genetic diversity

Activities such as selective harvesting and the destruction of natural habitats result in a loss of diversity. Genes that are lost may have many benefits, so it is critical to conserve diversity for human well-being and to keep a species from becoming extinct. By conserving diversity, it is possible to grow genetically diverse

and disease-resistant species in cases of drought or a sudden outbreak of disease when the entire crop is destroyed. There are several methods for conserving biodiversity:

In-situ conservation: Because it is impossible to conserve all of biodiversity, certain "hotspots" are identified and protected to protect species that are endemic to a specific habitat and are threatened, endangered, or on the verge of extinction.

Ex-situ conservation: Threatened plants and animals are removed from their natural habitats and housed in a special environment to receive special care and protection. Botanical gardens, zoos, wildlife safaris, and so on.

- Gametes of threatened species are preserved in viable and fertile conditions for a longer period of time using cryopreservation techniques.
- *In-vitro* fertilisation of eggs and tissue culture plant propagation
- A genomic library is a recent advancement in the preservation of genetic diversity.

Factors of genetic diversity

Four events that control evolution influence genetic diversity: mutation, genetic drift, gene flow, and natural selection. Only mutations, however, can result in completely new alleles.

Mutations

Mutations are changes in DNA's nucleotide sequence. Mutations occur primarily as a result of gene and chromosome replacement or change. Mutations can result in the emergence of new alleles, altering the genetic structure of a population. Spontaneous mutations are uncommon. They have little effect on changing the genetic structure of a population and have a negligible effect over short time periods. As a result, mutations do not control evolution. Mutations, along with other adaptation mechanisms that influence evolution, can, however, be a significant source of genetic diversity in a population.

Correspondence to: Friesen James, Department of Biological Informatics Program, University of California, California, United States, E-mail: Friesenjames@gmail.us

Received: 01-Aug-2022, Manuscript No. HGCR-22-18470; **Editor assigned:** 05-Aug-2022, PreQC No. HGCR-22-18470 (PQ); **Reviewed:** 18-Aug-2022, QC No. HGCR-22-18470; **Revised:** 25-Aug-2022, Manuscript No. HGCR-22-18470 (R); **Published:** 01-Sep-2022, DOI: 10.35248/2161-1041.22.11.225

Citation: James F (2022) Genetic Diversity: Importance, Conversation and its Factors. Hereditary Genet.11: 225.

Copyright: © 2022 James F. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Genetic drift

Genetic drift is a random change in the frequency of a specific allele within a population from generation to generation caused by chance sampling events, which is less noticeable in large populations. Genetic drift occurs when some alleles are randomly selected to be inherited by offspring. It affects genetic diversity by preserving some alleles while eliminating others, because changes in allele frequencies can result in more significant differences between populations. Genetic drift affects small populations more than large ones because the effect of fixed or lost alleles is more likely to appear in small populations.

Gene flow

Gene flow, also known as gene migration, is the transmission of alleles across populations. Gene flow occurs when new generations are born with a specific allele that has been passed down from a donor population to a recipient population. Both have varying frequencies of this allele. Pollen, for example, may be spread to distant locations by wind carrying alleles from one population with a high allele frequency to another with a low allele frequency. A species, on the other hand, is the largest unit within which gene flow can easily occur.