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Gene Polymorphism

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INTRODUCTION TERMS "POLY" AND "MORPH"

Poly: By "poly", we mean "multi" or "more than one". Hence, genes having multiple traits, i.e. two or more than two traits, result in polymorphism.

Morph: this is often a term that refers to varied forms or stages within the lifetime of an organism. The different forms or stages can also be stated as "morphs."

Polymorphic: The combined term refers to the existence of more than one form of traits in a species.

A gene is claimed to be polymorphic if quite one allele occupies that gene's locus within a population. In addition to having quite one allele at a selected locus, each allele must also occur within the population at a rate of a minimum of 1% to generally be considered polymorphic. Polymorphism involves one among two or more variants of a specific DNA sequence. The most common sort of polymorphism involves variation at one nucleotide. Polymorphisms also can be much larger in size and involve long stretches of DNA.

All the kinds of blood groups are the instance of genetic polymorphism, like the ABO blood type system. We see this technique having quite two morphs: A, B, AB, and O are the variants present within the entire human population, but these groups vary in proportion in different parts of the world.

One example of polymorphism are often observed in jaguars. This species has quite one trait in its skin coloring. You must have seen jaguars with dark spots or light spots. This is because they need different morphs for his or her complexion . As there's quite one possible variation in their gene, this is often called polymorphism.

TYPES

A polymorphism can be any sequence difference. Examples include:

Single nucleotide polymorphisms (SNPs) are one nucleotide changes that happen within the genome during a particular location. The single nucleotide polymorphism is that the commonest sort of genetic variation.

Small-scale insertions/deletions (Indels) contain insertions or deletions of bases in DNA.

Polymorphic repetitive elements, active transposable elements also can cause polymorphism by inserting themselves in new locations. For example, repetitive elements of the Alu and LINE1 families cause polymorphisms in human genome.

Microsatellites are repeats of 1-6 base pairs of DNA sequence. Microsatellites are commonly used as molecular markers especially for identifying the connection between alleles

Polymorphism is often maintained by a balance between variation created by new mutations and survival (see mutational load). Genetic variation could also be caused by frequency-dependent selection multiple niche polymorphisms exists when different genotypes should have different fitness's in several niches.

Why is genetic polymorphism important to evolution?

One of the main causes of interindividual variation of drug effects is genetic variation of drug metabolism. Genetic polymorphisms of drug-metabolizing enzymes produce to distinct subgroups within the population that differ in their ability to perform certain drug biotransformation reactions.

Polymorphism has caused controversy about its role in evolution. But if it essentially follows a neutral evolution, it is a reference, in contrast, for the study of survival . It is also employed by ecologists in conservation biology to reconstruct the past history of species

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