Prep 15

Science, Biology

Genetics GENETICS Whereas Genetic drift is the change in the rate of a gene variant in a population caused byrandom sampling of organisms, natural selection is the concept used to denote the phenomenon where natural events determines the reproducing species. The law of large numbers in reproduction predicts that the effect of genetic drift is much gentle when the population is large. On the other hand, the effects of genetic drift when the population is small are quite significant. In this case, the genetic drift (allele mechanism) is considered as a consequential mechanism of evolution. In this case, variations in these isolated populations will be more as a result of genetic drift compared to natural selection.

The molecular clock is a methodology in molecular evolution that uses rates of molecular change and fossil constraints to determine the time in geologic history when two species diverged. The technique is used to approximation the duration of occurrence of events called radiation or speciation. The molecular statistics used for such computations are usually for DNA sequences or amino acid sequences. It is possible to tell that the molecular clock is working because its principle of working is based on Charles Darwin theory of ev0lution. In addition, the concept of DNA sequence has been integrated in modern fossil dating techniques. In this case, the result obtained from molecular clock techniques are usually compared with those of other methodology. The molecular clock techniques yield desirable results when the species generations are not changing from time to time. The population size has to be sizeable to reduce the effect of genetic drift and the nature of protein studied requires being stable.

The neutral evolution theory, according to Sittyr (2009), is used for null

hypothesis since it holds that the molecular evolutionary changes and other variation within species is not as a result of natural selection but by random drift of neutral mutant alleles. The concept is used to detect natural selection since it works to explain that genes do not experience natural selection but are affected by genetic drift. In this case, if the hypothesis of neutral evolution is not proven, then the national selection has taken place. When a synonymous, also referred to as silent mutation, occurs the change is frequently assumed to be neutral. This means that the ration of the organisms that are not affected by the mutation shows fitness of the individual with the new gene to reproduce and survive.

Inbreeding is the production of offspring as a result of the breeding of individuals that are closely related genetically. In this case, offspring from a given parents are allowed to breed. The offspring from genetically related species are produced as a result of inbreeding. Inbreeding results in presence of identical recessive genes making them to be represented in the phenotype. In this case, a large number of genetic disorders emanate from inbreeding. They include reduced fertility rate, low birth rate, high mortality rate, reduced size and non-functional immune system. To the genotype, inbreeding increases the rate of pairing up of recessive genes leading to the pair being indicated as a weakness in the phenotype. Bottlenecking denotes a drastic reduction on the populations of a given species. This reduces the number of possible sets of mating animals leading to a higher chance of inbreeding.

Reference

Sittyr , D. (2009). Genetics; theories and techniques of evolutions. : Boston. Print