

Modern Synthetic Theory of Evolution

The modern synthetic theory of evolution describes the evolution in terms of genetic variation in a population that leads to the formation of new species. It explains the contribution of factors such as genetic isolation, reproductive and geographical isolation, and natural selection. Julian Huxley coined the term in his book 1942, Evolution the modern synthesis.

There are three main concepts of modern synthetic theory of evolution.

- ① Genetic variation
- ② Natural selection
- ③ Isolation.

① Genetic Variation:- They are caused due to various aspects of mutation, recombination and migration. The change in gene and gene frequencies.

is known as genetic variation. Genetic variation are caused by factors such as gene mutation, genetic recombination, gene flow, genetic drift and chromosomal aberration.

2. Natural Selection :- Natural selection is the process by which better-adapted organisms grow and produce more number of offspring in the population. It is the main driving force behind evolution. It states that the fittest organism will get selected by nature and produce more offsprings than organisms that did not adapt to the as per the conditions. It brings about evolutionary changes by favouring differential reproduction of genes that bring about changes in gene frequency from one generation to another. Natural selection invariably encourages those genes that assure

the highest degree of adaptive efficiency betⁿ a population and its environment.

3. Isolation: It is the separation of the populations of a particular species into smaller units that prevents interbreeding betⁿ them. A barrier that prevents gene flow or exchange of genes betⁿ isolated population, is called isolating mechanism. A number of isolating mechanisms are operated in nature and therefore divergence and speciation may occur. The isolating mechanism are of two types namely, geographical isolation and reproductive isolation.