

Concept of theory of evolution and gene transmutation

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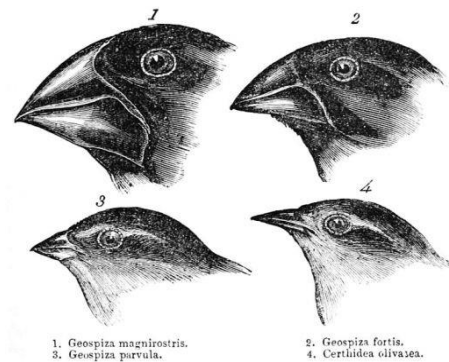
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Introduction

Transmutation is the process by which an organism undergoes a whole transformation as a result of a genetic transfer or mutation. Transmutation causes changes in the organism's structure, appearance, and metabolism. In evolution, transmutation is a crucial process. Transmutation principles are consistent with Darwin's theory of evolution, making it an immensely essential evolutionary process. Transmutation is also a procedure used in recombinant DNA technology. The visual effect of transmutation is noticeable. The idea of evolution by natural selection, initially proposed in Darwin's book "On the Origin of Species" in 1859, describes how animals evolve over time due to changes in heritable physical or behavioural features. Changes that allow an organism to better adapt to its surroundings will increase its chances of survival and reproduction. Over the course of several generations, natural selection can cause minor changes in a species, such as changes in size or color in the population. We refer to this as "microevolution." However, natural selection is far more powerful than that. "Macroevolution" is the process by which natural selection generates totally new species when sufficient time and cumulative changes are present. It has the power to transform amphibious animals into whales, dinosaurs into birds, and ancestor of ape into humans.



Modern concept of theory of evolution

The Modern Synthetic hypothesis of Evolution is a variation on Darwin's Natural Selection hypothesis. It is referred to as Neo-Darwinism. Neo-Darwinism hypothesis is a synthesis of Darwin's theory with contemporary genetics. According to the Modern Synthetic Theory of Evolution, not all variation, as claimed by Darwin, is caused by genetic changes; only inherited (mutations) variations are responsible for evolution. The term "Modern Synthetic Theory of Evolution" refers to the current understanding of evolution, which is a synthesis of hypotheses of Hugo de Vries and Darwin. Following this, the neo-Darwinian theory of evolution emerged, which emphasized the role of mutations and variations in a population as a driving force of evolution. This viewpoint was upheld for many years. The modern synthesis was dominant in the early twentieth century, according to Charles Darwin's theory of evolution and Gregor Mendel's theories on inheritance as a connected mathematical substructure. Julian Huxley

coined the phrase in 1942, in his book *Evolution: The Modern Synthesis*. The five key elements influencing current synthetic evolution are gene mutation, genetic variation or recombination, natural selection, genetic drift, and isolation.

History behind gene transmutation

1. In his study of the inheritance of flower colour in Evening Primrose, Hugo de Vries called the sudden and random appearance of new characters as mutation but the observed mutations were actually chromosomal aberrations; he concluded that single mutation created new species.
2. Morgan studied eye color inheritance in *Drosophila*, using radiations to create white-eyed fly in a red-eyed generation.
3. Stadler studied mutation in corn and investigated the differences in the impact of UV and X-ray treatments on the induction of mutation in corn.
4. Muller employed radioactivity to create point mutations in the fruit fly *Drosophila*. He treated male fruit flies to high doses of radiation before mating with virgin female fruit flies, resulting in over 100 mutations. It was determined that radioactive particles pass through the chromosomes and randomly modify the chemical structure of individual genes, rendering them non-functional or with altered function. He published his results under the term "Artificial Transmutation of Gene."

Haber, J.E., 2023. 101 years ago: Hermann Muller's remarkable insight. *Genetics*, 223(4), p.iyad015.

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Darwin's finches by Gould" By John Gould (14.Sep.1804 – 3.Feb.1881) – From "Voyage of the Beagle", also online through Biodiversity Heritage Library (Public Domain) via Commons Wikimedia