

Miller-Urey experiment

Chemical origin of life

Electric discharge in a container with CH_4 , H_2 , NH_3 and water vapour at 800°C

Alexander Oparin

Written the book "Origin of life"

Oparin and Haldane proposed that life existed from organic molecules

Divergent evolution

Evolution from common ancestry due to different adaptations

E.g. Homologous organs, forelimbs of mammals, vertebrate heart, brain, tendrils and thorn or *Cucurbita*, *Bougainvillea*, etc.

Convergent evolution

Similarities in the different structures due to performing the same functions

E.g. Analogous organs, wings of birds and butterflies, eyes of octopus and mammals, root and stem modifications in sweet potato and potato

Adaptive radiation

Diversification of a species into new forms due to environmental changes and resource availability

E.g. Finches in Galapagos island, marsupials in Australia

Hugo De Vries

Mutation theory of evolution

He worked on evening primrose

Saltation- single step large mutation causing speciation

Population genetics

Study of gene frequency in a population

Gene frequency- the proportion of alleles of a gene in the population

Hardy Weinberg Principle

The allelic frequency in a population remains constant

Factors affecting genetic equilibrium are- gene migration, genetic drift, mutation, recombination and natural selection

$$p^2 + q^2 + 2pq = 1$$

$$p^2 = AA, q^2 = aa, 2pq = Aa$$

Founder effect

Reduction in genetic variation, when a small group of individual get isolated from a large population

Ichthyosaurs

Fish-like reptiles

200 mya

Tyrannosaurus rex

The largest dinosaurs

20 feet in height

Homo habilis

First human-like, hominid

2.3-1.65 mya

Brain capacity- 650-800cc

Did not eat meat

Homo erectus

Fossils discovered in 1891 in Java

1.5 mya

Brain capacity- 900cc

Ate meat

Neanderthal

Lived around 1,00,00-40,000 years ago

East and Central Asia

Brain capacity- 1400cc

Homo sapiens

Evolved around 75,000-10,000 years ago

Brain capacity- 1350cc