EVOLUTION

Evolutionary biology is the study of history of life forms an earth, the evolution of life an earth, different changes In tiara and fauna around earth that co-exist along with human beings also forms parts of evolution_

Origin of life

- **Big Bang Theory attempts to explain the origin of universe. According to this theory a huge explosion Occurs that forms the different galaxies.**
- In solar system of Milky *Way* galaxies, earth has been supposed to be formed about 4.5 billion years ago. There was no atmosphere In early earth, water vapour, methane, carbon dioxide and ammonia released from molten covered the earth surface_
- **UV rays from sun splits the water into Frydrogen and oxygen. Life appeared SDO million years after the formation of earth,**
- **There are different theories regarding the origi n of Dean earth-**
  - **Some scientist believes that life comes from other planets_ Early Greek thinker thoughts that unitef life is co lied spores trapsferred from other planets.**
  - ✓ **According to other theory, life comes out of dead and decaying matters like *straw* and mud. Thls theory is called theory of sixintaneous origin_**
  - o **Louis Pasteur eVeriMentally pram'el that life arises only from pre-existing life_**
  - **Dparin and Haldane proposed that the first form of life could have .corne frorn pre-existing non-liming organic molecules li ke RNA and protein etc_ The formation of life preceded by chemical evolution_ At that time condition on earth were- high temperature, volcanic eruption,. reducing atmosphere CCIntaining CH., and N H,.**

Miller experiment *of Origin of Lift*- Si. Miller in 15L conducted an experiment to show the origin of life on earth in the physical a nvi ranrnent similar to condition prevails at that time.

Miller created electric discharge in a flask containing iiz and NH_3 and water vapour at 80C1 ^{o}C. He Observed formation of amino acids after 15 days in the flask_

The theory, that first form of ilfe arose slowly through. evolutionary forces from non•living molecules is called biogenesis.

ut Life forms

- Pylany, theory were proposed by different thinkers,. scientist and religious literatures about the origin of different forms of Wean earth.. The main theories include-
- * **Religious literatures tell us about special creation theories,**

Evidence of Evolution

Evidence that evolution of life forms has taken place on earth have Many proofs as mentioned below-

I. Paleontological evidence- different aged rock sediments contain fossils of different life forms that probably died during the formation of particular sediment_

2. Homologoviorguns- those organsthat perform different function but have similar origin and structure are called homologous organs_

In these animal similar structure developed along different directions due to adaptation of different needs. This is called divergent evolution.

3_ Analogous structures- they are not anatomically similar organs but perform similar function_ This is the to habitat that resulted In sIrnila r aclaptii.oe features in different groups of organisms.. This that of evolution is called convergent evolution.

4. Evolution by natural selection.

Adaptive Rad.lation- the process of evolution of ditferent species in given geographical area starting from a point and radiating to other areas crf geography (habitat) is called adaptive radiation. Darwin's finches represent one of the best examples of adaptive radiation,

Biological Evolution – the nature select for fittest and fitness is based on characteristim which are inherited. Some organisms are better adapted to survive in otherwise hostile environment. Fitness is the end result of the ability to adapt and get selected by nature.

I Lamarck had said that evolution of life form had occurred but driven by use and disuse of organs. He gave the exam pie of siraffe to evolve their neck.

■ Darwin theory of natural selection was based on certain observations like-
- O Limited natural resources.
- o Over population
- Q Struggle for existe nce
- o Survival of the fittest.

Mechanism of Evolution

:0- Hugo de Vries based ork his work cm evening primrose brought forth the idea di mutation. Mutations are random and directionless while Darwin variations are small and directional_ Hugo de Vries believed that mutation causes speciatim and hence called saltation.

Hardy-Weinberg Priicipfe-

- Tl is principle states that allele frequencies in a population a na stable and is constant frorn generation to generation_ The gene pool remains constant. This i5 called genetic equilibriurn and sum total of all the allelic frequencies Is 1.

  Binomial expansion of fp 4 q11 ^{2} ■ p +2pq • .11.^{2} ⊑ 1. Where p and q are the frequency of different alleles_
- When frequency is rnaasured, the actual ...aloe varies that indicates the ettent of evolutionary changes. Change of frequency in a alleles (Hardy_Wein berg equilibrium) in a population resu lted due to evcdution.

● The factors that affect Hardy-Weinberg equilibrium are-
- Gene migration or gene flow
- ■ Genetic drift
- ■ Mutation
- di Genetic recom bination
- Natural selection

Sometimes change in alleles frequency is so different in a sample of population that they become a different species,. The original drifted population becomes founder and that effect Is called founder effect_

Orligin and Evolution of **Min**

- **About 15** maya, **primates called Divopitheous and RarnapIthecus, exists. They are hairy and walked like gorilla and chimpanzees. Ramapithecus are more man like and Dryopithecus are more like apes.**
- **The first creatures that was human like being the hominid and** we5, **called kforno habilis having brain capaities** 650-no
- **The fossils disco vied in Ova in 1891 revealed the** Home erecbus **having brain about 94:10cc. Homo sapiens arose is Africa and moved across the continent' and developed Into distinct races.**
- **During** isP **age between 75,000 to 10000 yeerS. ago** modern [illegible] **cave art developed about 12)300 years ago and agriculture tomes around 10,0010 years back to start human settlement.**