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Sub. Biology

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The Origin of Life and Evidences of Evolution:

1. The study of history of life forms on earth is called evolutionary biology.

2. Evolution is a process that results in heritable changes in population spread over many generations leading to diversity of organisms on earth.

3. Origin of life is considered a unique event in the history of universe.

(i) The Universe

(a) It is very old-almost 20 billion years ago. It contains huge galaxies.

(b) Galaxies contain stars and clouds of gas and dust.

(c) The origin of universe is explained by Big Bang theory.

(d) The Big Bang theory states that a huge explosion occurred, the universe expanded, temperature came down and hydrogen and helium were formed later. The galaxies were then formed due to condensation of gases under gravitation.

(ii) The earth was supposed to have been formed about 4.5 billion years back in the solar system of the milkyway galaxy.

(a) Water vapour, methane, carbon dioxide and ammonia released from molten masses covered the surface.

(b) UV rays from the sun broke up water molecule into hydrogen and oxygen and lighter hydrogen escaped.

(c) Oxygen combined with ammonia and methane to form water, carbon dioxide and others.

(d) Ozone layer formed, as it cooled, the water vapour fell as rain to fill depression and form oceans.

(e) Life appeared 500 million (about 4 billion years back) years after the formation of earth.

4. Theories of origin of life were given by different thinkers and scientists.

(i) Theory of special creation states that God created life by his divine act of creation.

(ii) Theory of panspermia/cosmozoic theory, given by early Greek thinkers states that the spores or panspermia came from outer space and developed into living forms.

(iii) Theory of spontaneous generation states that life originated from decaying and rotting matter like straw, mud, etc.

(a) Louis Pasteur rejected the theory of spontaneous generation and demonstrated that life came from pre-existing life.

(b) In his experiment, he kept killed yeast cells in pre-sterilised flask and another flask open into air. The life did not evolved in the former but new living organisms evolved in the second flask.

(iv) Theory of chemical evolution or Oparin-Haldane theory states that life originated from pre-existing non-living organic molecules and that formation of life was preceded by chemical evolution.

The conditions on the earth that favoured chemical evolution were very high temperature, volcanic storms and reducing atmosphere that contained CH_4 , NH_3 , water vapour, etc.