

# Complete BIOLOGY

## NEET · CBSE eBOOKS CLASS 11&12th

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### CLASS 12<sup>th</sup>

### **Evolution**



#### 01. Big -Band Theory:

This theory was proposed by Abbe Lemaitre. According to it, the universe orginated about 20 billion years ago due to a thermonuclear explosion of a dense enetity. This thermonuclear explosion is called **Big- bang** About 4.5 billion years ago, the origin of our solar system took place by the gaseous clouds formed due to this explosion. These gaseous clouds collapsed and converted into flat disc-like structure made up of atoms and small particles due to their own gravitational pull. These flat-disc like structure is called **SOLAR-NEBULA** 

#### 02. Ancient Theories For Origin of Life:

#### (i) Theory of special creation-

Mythology based theory

The greatest supporter of this theory was father Suarez. According to Bible life and everything was created by god in 6 days.

#### (ii) Theory of Spontaneous Generation (Abiogenesis or Auto genesis)-

This hypothesis was supported by ancient Greek philosophers like Thales, Anaximander, Xenophanes, Plato, Empedocles, Aristotle. According to this theory life was originated from nonliving things or decaying and rotting matter like straw, mud etc. spontaneously They believed that the mud of the **Nile** river could give rise to frogs, snakes, crocodiles.

#### (iii) Cosmozoic Theory-

#### Proposed by Richter

Protoplasm reached on earth in the form of **spores** or other simple particles form some unknown part of the universe with cosmic dust and they gave rise to various forms. of life.

#### (iv) Cosmic panspermia theory

#### Proposed by Arrhenius.

According to this theory organism existed throughout the universe and their spores could freely travel through space from one star to the other.

#### (v) Theory of Biogenesis

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#### Harvey (1651) and Huxley (1870)

#### Omnis vivum ex ovo or vivo.

New organisms can be originated on earth only by pre-existing life. This theory reject the theory of Spontaneous generation but cannot explain origin of life. To prove Biogenesis and to disprove abiogenesis experiments were performed by-

#### Francesco Redi's Experiment (Italian 1668)-

He took cooked meat in three jars one was uncovered, the second was covered with parchment and the third was air tight. He observed that maggots develops only in the uncovered jar while maggots could not developed in the meat in closed jars. This proved that larvae were formed form eggs laid by the files in open jars. Since the meat in closed jars could not be visited by files so no large could develop. Therefore life originated from preexisting life.

#### Lazzaro Spallanzani (Italian 1767)-

He boiled vegetables and meat to prepare a sterlized nutritive soup and the he kept some of it in air sealed flasks and some in loosely corked flasks Evolution

He observed that the soup in sealed flask remained sterile while microorgan- isms appeared in the soup in loosely corked flasks.

Thus even microorganisms were formed from pre - existing ones in the air rather then spontaneously.

#### Louis Pasteur (French 1862)-

Pasteur is popular for **Germ Theory of Diseases of Germ theory** and he disproved abiogenesis. He prepared sterlized **syrup** of sugar and killed yeast by boiling them in flasks. He took two flasks one of broken neck and another of curved neck (swan neck flask). No life appeared in swan neck flask because germ laden dust particles in the air were trapped by the curved neck which serves as filter while in broken flask colonies of microorganism were developed. By the experiment he proved that life comes only from pre-existing life.

#### Modern theory of origin of life

(Oparin-Haldane theory of origin of life)

#### Naturalistic theory OR Theory of Chemical Evolution-

- This theory was proposed by Russian Scientist A.I Oparin and J.B.S Haldane (England born Indian scientist) Oparin's theory was published in his book ORIGIN OF LIEF
- According to this theory life originated by the composition of chemicals
- Oparin and Haldane proposed that the first form of life could have come from pre-existing non living organic molecules and that formation of life was preceded by chemical evolution.

#### 03. Chemical Evolution

#### (i) The atomic stage-

The earth was originated about 4.6 billion years ago Early earth had free atoms of all those elements which are essential for the formation of protoplasm. The lightest atoms like carbon, hydrogen, nitrogen and oxygen formed the primitive atmosphere. most abundant of all of them was hydrogen

(ii) Molecular stage (Origin of molecules and sim-ple Inorganic compounds)-Free atoms combined to form molecules and simple inorganic compounds. Due to presence of high temperature, active hydrogen atoms combined with all oxygen atoms to form water and leaving no free oxygen. Thus the primitive atmosphere was reducing (without free oxygen.) unlike present oxidising atmosphere (with free oxygen). Hydrogen atoms also combined with nitrogen to form NH<sub>3</sub>.

#### (iii) Origin of early organic compounds-

the nitrogen and carbon of the atmosphere combined with metallic atoms forming nitrides and carbides. Water vapour and metallic carbides reacted to form the **first organic compound Methane (CH<sub>4</sub>)** Later on **hydrogen cyanide (HCN)** was formed. Water which formed. on earth due to high temperature evapourated so **clouds** were formed. Water vapor changed into rain drops and by the collection of water on earth primitive oceans were formed.

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