

Theory of Natural Selection

10+2

Evolutionary Biology

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First non-cellular forms of life could have originated 3 billion years ago in the form of giant molecules (RNA, Protein, Polysaccharides, etc.). These capsules were capable of reproducing perhaps.

First cellular form of life possibly originated about 2000 million years ago, possibly, in the form of single-cells. They were in water environment only. This is a biogenesis, i.e., the first form of life arose slowly from non-living molecules, is accepted by majority.

EVOLUTION OF LIFE FORMS - A THEORY

Theory of special creation:

It is from conventional religious literature that has three connotations.

1. That all living organisms (species or types) of these days were created as such.
2. That the diversity was always the same since creation and will be the same in future.
3. That earth is about 4000 years old.

All these ideas were strongly challenged during the nineteenth century.

Theory of natural selection:

Based on observations made during a sea voyage in a sail ship called H.M.S. Beagle round the world, Charles Darwin concluded that existing living forms share similarities to varying degrees not only among themselves but also with life forms that existed millions of years ago. Many such life forms do not exist any more. There had been extinctions of different life forms in the years gone by just as new forms of life arose at different periods of history of earth. There has been gradual evolution of life forms. Any population has built in variation in characteristics. Those characteristics which enable some to survive better in

natural conditions (climate, food, physical factors, etc.) would outbreed others that are less-endowed to survive under such natural conditions.

The fitness, according to Darwin, refers ultimately and only to reproductive fitness. Hence, those who are better fit in an environment, leave more progeny than others. These, therefore, will survive more and hence are selected by nature.

He called it *natural selection* and implied it as a mechanism of evolution.

Alfred Wallace, a naturalist who worked in Malay Archipelago had also come to similar conclusions around the same time. In due course of time, apparently new types of organisms are recognisable. All the existing life forms share similarities and share common ancestors. However, these ancestors were present at different periods in the history of earth (epochs, periods and eras). The geological history of earth closely correlates with the biological history of earth.

EVIDENCES OF EVOLUTION?

Evidence that evolution of life forms has occurred on earth has come from many quarters.

Paleontological evidence: Fossils are remains of hard parts of life-forms found in rocks. Rocks form sediments and a cross-section of earth's crust indicates the arrangement of sediments one over the other during the long history of earth. Different-aged rock sediments contain fossils of different life-forms who probably died during the formation of the particular sediment. Some of them appear similar to modern organisms.