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EDITORIAL

Biology and evolution of life science

1. Introduction

Biology literally means "the study of life". Life Sciences attempts to untie the living things mysteries from the working of protein 'machines', to the growth of organism from a single cell to the majesty and intricacy of whole ecosystem. Questions about life sciences are as diverse and fascinating as life itself like; how a single cell knows to build up complex organism? How interpretation of genetic information takes place?

How the properties of organism are affected due to gene mutation? How ecosystem changes due to climate?

What can human genetic variation tell us about the history of human evolution and migration? Evolution is the change in heritable traits of biological populations over successive generations. Evolutionary processes give rise to diversity at every biological organization level. All life on earth shares a common ancestor known as the last universal ancestor. In the mid-19th century, Charles Darwin formulated the scientific theory of evolution by natural selection, while in the early 20th century the modern evolutionary synthesis integrated classical genetics with Darwin's theory of evolution by natural selection through the discipline of population genetics. Evolution is a cornerstone of modern science, accepted as one of the most reliably established of all facts and theories of science, based on evidence not just from the biological sciences but also from anthropology, psychology, astrophysics, chemistry, geology, physics, mathematics, and other scientific disciplines, as well as behavioral and social sciences.

2. Theory of evolution on Earth

Today life diversity on earth is the result of evolution. On Earth life began at least 4 billion years ago and it has been evolving every year. In the beginning all living things on earth were single celled organism, after several years multicellular organism evolved after that diversity in life on earth increased day by day. Here in the figure shows the history of life on earth (Fig. 1).

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DNA (deoxyribonucleic acid) is the double helix structure shown in Fig. 2. Its duplicate copies have coded information coiled up in almost all of the 100,000,000,000,000 (one hundred trillion) cells in your body. In human DNA has 46 segments; 23 segments received from father and 23 from mother. Each DNA contains exclusive information that determines what you look like, your personality and how your body cell is to function throughout your life.

If one cell whole DNA was uncoiled and stretched out then it would be six feet long. Its detailed structure could not be seen due to its thin structure even under electron microscope. If all the coded information from one cell of one person were printed on books then it would fill a library of four thousand books and if the whole body DNA were positioned continuously, it would extend from here to Moon more than 500,000 times. If one set of DNA from each individual who still lived were placed in a *pile,* the final pile would weigh less than an aspirin.

3. Generic information

Different Scientists gave different information about genetic evolution like; Carl Sagan who showed by using simple calculation that how one cell's value of genetic information approximates four thousand books of written information while volume of each book would have 50 cubic inches (Sagan, 1977). 1014 cells are present in each adult individual. About 800 cubic miles have been worn from the Grand Canyon. According to that if each cell in one individual's body was reduced to four thousand books then they would fill the Grand Canyon 98 times.

$$\frac{10^{14} \times 4000 \times 50 \text{ inches}^3}{800 \text{ mile}^3} \times \left(\frac{\text{mile}}{5280 \times 12 \text{ inches}}\right)^3 = 98$$

From earth the moon is 240,000 miles. If the human cell DNA were prolonged out and linked, it would be more than 7 feet long. If the entire DNA in one individual's body were located back-to-back, it would enlarge to the moon 552,000 times.

$$\frac{10^{14} \times 7 \text{ feet}}{240,000 \text{ miles}} \times \frac{\text{mile}}{5280 \text{ feet}} = 552,000$$

The weight of DNA in human cell is 6.4×10^{-12} g and almost less than fifty billion individuals lived on earth, if one

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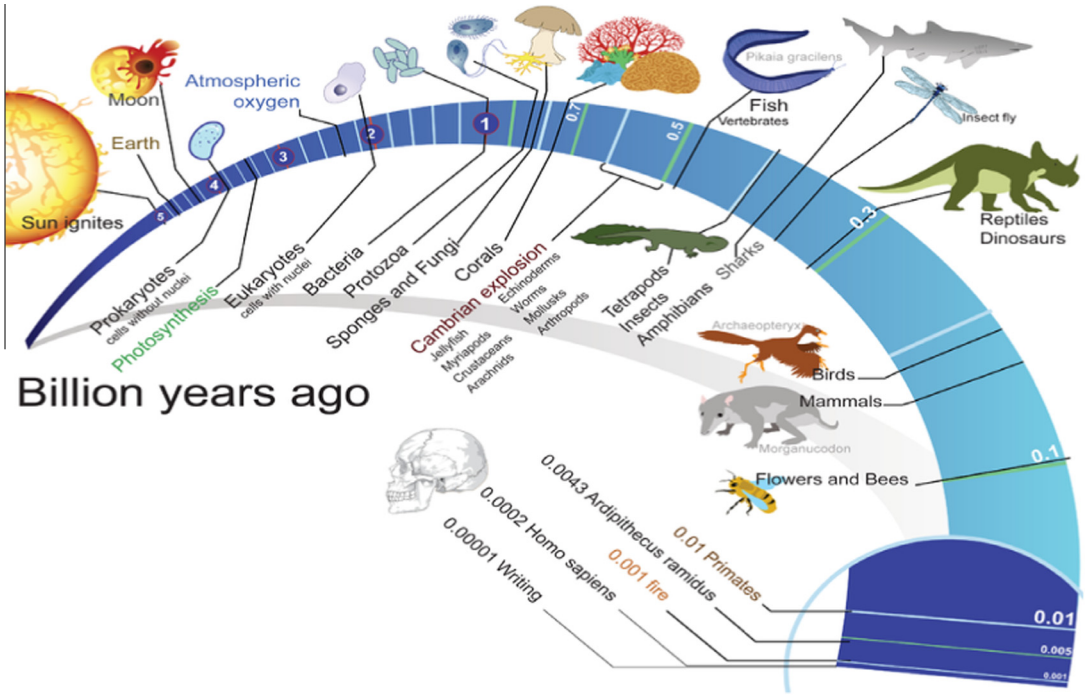

Figure 1 Timeline for history of life on Earth.

Figure 2 Depictions of Saturn, DNA, and the Ark.

copy of DNA from living individual were taken it is enough to define the physical characteristics of all those inhabitants in microscopic aspect and would weigh only, which is less than the weight of 1 aspirin.

$$6.4 \times 10^{-12} \times 50 \times 109 = 0.32 \text{ g}$$

According to Hoyle and Wickramasinghe, biochemical systems are exceptionally composite, so much so that the possibility of their being shaped from side to side haphazard shuffling of simple organic molecules is remarkably small, to a position certainly where it is inertly different from zero (Hoyle and Wickramasinghe, 1999). Life cannot have a random beginning, like monkey's troops thundering on typewriter could not be able to produce Shakespeare work. For the realistic cause entire visible universe is not vast adequate to hold the essential monkey hordes, essential typewriters, and surely the baskets for waste paper required for the deposition of wrong attempts. The same is true for the living matter.

The simple truth is not mentioned by Hoyle and Wickramasinghe that even a few correct words typed by monkey's hordes would decompose long before a whole sentence of Shakespeare was completed. In the same way, a small number of correct amino acids sequences would decay long before a protein was completed, not to point out that thousands of proteins must be at their proper place in a living cell. At last the most composite condition of all is the occurrence of working DNA (Vogel, 2001). They also state that our intelligence must reflect a vastly superior intelligence, even the tremendous idealized limit of God. They also believe that life was created by some intelligence somewhere in outer space and latter was

transported to the Earth. All point mutations that have been studied on the molecular level turn out to reduce the genetic information and not to increase it (Storz, 2002).

As Murray Eden reported that it is our contention that if 'random' is given a serious and crucial interpretation from a probabilistic opinion, then the randomness assumption is greatly improbable and a sufficient scientific theory of evolution has to wait for the finding and clarification of new natural laws like physical, physico-chemical, and biological (Eden, 1967). I. After clearing up the above to a scientific symposium, Hoyle said that evolution was similar with the possibility that "a tornado sweeping through a junk-yard might assemble a Boeing 747 from the materials therein.

According to Ohno's likable term is junk DNA that traps and no doubt dispirited a generation of researchers from studying the huge amount of important "junk" DNA that did not code for proteins (Ohno, 1972). This study made an insightful point that if all the DNAs of human, mice and other organisms were useful then after so many mutations that build up in hundreds of millions of years then those species become extinct.

In different species non coding DNA differs more as compared to protein coding DNA. If we find a particular protein coding gene in human then we find nearly the same gene in mice and that rule just does not work for narrow elements. The biggest mistake in the history of molecular biology is the failure to recognize the importance of introns (Mattick, 2003).

In transcription regulation, replication, RNA processing, translation and protein degradation non coding RNAs play an important role. Recent studies show that non coding RNAs are more important and abundant as compared to those initially imagined. The term junk DNA which is used is the reflection of our ignorance, non gene sequence also has their regulatory role (Birney, 2012).

Fig. 3 shows that macroevolution would need a rising change in the complication of definite traits and organs while the microevolution is involved only in horizontal changes with no rising complications. Most of the creationists agree that natural selection occurs but it does not result in macroevolution.

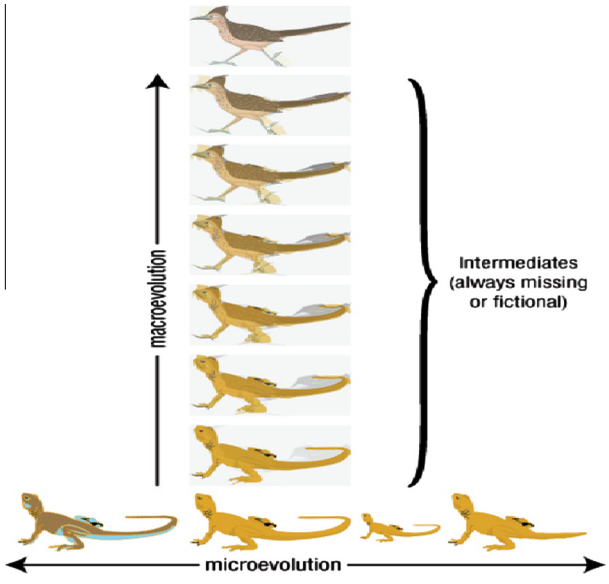

Figure 3 Macroevolution vs. microevolution.

Today, the most accepted theory of life on Earth is evolution, and there is a vast amount of evidence supporting this theory. However, this was not always the case. Evolution can be described as a change in species over time. Dinosaur fossils are significant evidence of evolution and of past life on Earth. Before taking into consideration that how life began, first of all we understand the term organic evolution. It is naturally occurring and beneficial change that produces rising and inheritable complication. If the offspring of one form of life had a different and improved set of vital organs then this is called macroevolution, but the microevolution does not increase the complexity. By one or more mutation only size, shape and color are altered (Taubes, 2009). Microevolution can be thought of as horizontal change, while macroevolution would involve vertical beneficial change in complexity. So the combination of microevolution and time will not produce macroevolution. Evolutionists have the same opinion that microevolution takes place. Since the start of history a minor change has been observed. But become aware of how frequently evolutionists give confirmation for microevolution to hold up macroevolution. It is macroevolution which requires new abilities and rising complication, resulting from new genetic information and is the center of the creation-evolution argument (Maher, 2012).

4. The key parts of the theory of evolution

- Charles Darwin's observations and how they support the theory of evolution and the idea of natural selection.
- The role of natural selection in adaptation.
- Characteristics of micro evolutionary and macro evolutionary processes.

4.1. Top 5 misconceptions about evolution

4.1.1. It is just a theory

In everyday language theory' might mean a hunch or a guess. For scientists theory refers to a well supported explanation.

Scientific theories and scientific laws are often confused.

Theories	Laws
Why something happen	What will happen
Explanation of Nature	Predictable outcome
Based on evidence	Based on evidence
Example: Atomic theory	Example: Newton law

*Evolution – The observation that organisms, including plants, bacteria and even molds change over time- depends on theory for explanation.

*The most well know theory of evolution is the theory of natural selection.

4.1.2. Fittest survival

Is this accurate for Darwin's theory of Natural Selection?

Fact 1 – Population tends to remain stable.

Fact 2 – Organisms reproduce more offspring than could be supported.

Interference 1 – Not all the offspring live long enough to reproduce.

Fact 3 – Resources are limited

Fact 4 – Individuals within population differ in individuality.

Fact 5 – Inherited characteristics are more.

Interference 2 – There will be differential survival and reproduction.

This is Natural Selection.

Interference 3 – Over time these differences will shift the makeup of the population.

This is decent with modification. Evolution will occur.

*'Fit' organisms will live & thrive to pass their genetic material to the next generation.
*Fitness depends on reproducing & ensuring the survival of population rather than strength, speed or length.

4.1.3. Humans descend from Apes

*Evolution holds that all life on Earth share common Ancestry.
*Decent with modification means that human are unique as species, and we share many characteristics with other species.
*Primates share 90% DNA sequence identity with humans.

4.1.4. No one was there and It cannot be Proven

*Scientists operate like detectives.
*With a few pieces of evidence about an event the investigator searches for clues that would legitimize or refute a claim.
*Where is the support evidence coming from?

Evidence of evolution

- Biochemistry (DNA).
- Bones and fossils.
- Comparative anatomy and physiology.
- Computer modeling.
- Modern experiments.
- Developmental biology.

Journals publish evidence

*Before publishing, a journal will send a manuscript to other scientists who review and critique it.
*Peer review process often rejects manuscripts because there is not enough evidence to support the claims of the author. Science publishes less than 7% of submissions.
*This level of organized skepticism is unique to Science.
*Scientists become famous for overturning ideas and expanding paradigms.

4.1.5. Darwin was wrong

*Darwin lived in a different time. He constructed the theory of Natural Selection from observing the finches in the Galapagos Islands and many other species across the world.
*Genes was an unfamiliar term to that world.
*Cells were seen but not manipulated.
*Darwin's mechanism continues to unify all biology – a contribution comparable to those of Newton or Einstein.
*Today we define evaluation as changes in allelic frequency over time.
*If we map different forms of genes (alleles) of a population and after a few generations the frequency changes, evolution has occurred.
*This description is the best to date that captures the ever-changing living world.
*There are still many questions to ask and answer.
*How do genes play a role in producing the features of organisms?
*Why do mutations accumulate with different rates?
*How do we protect our crops if pests evolve?
*Evolution does not explain what started life, only how it persists, adapts, and changes.
*Life need only begin once for evolution to occur.

4.2. The origins of life

In the process of evolution a series of natural changes cause species to arise, familiarize yourself to the environment, and turn out to be extinct.

Evolution = Change

By the process of biological evolution all species originated. The term species refers to a group who can reproduce their fertile offspring. Scientist classify the species with two scientific name first is genus name and second is species name like humans referred as Homo sapiens. In populations, there are variations or differences between individual members because of the variety of genes (alleles). Examples are skin color in humans, coat color in foxes. When there is a change in genes inherited from parents to offspring in different proportions then evolution occurs. These variations in genes arose for either (1) recombination of alleles when they sexually reproduce or (2) mutations.

Mechanism of evolution occurs by different ways

1. Natural selection.
2. Biased mutation.
3. Genetic drift.
4. Gene flow.

Recombining genetic material can happen in three ways.

1. Independent assortment.
2. Crossing over during meiosis.
3. Combining egg and sperm when fertilization occurs.

Mutations are usually neutral or harmful. Sometimes they can be beneficial if the environment is under a state of change.

1. Point mutation – In this there is change in a single base pair in DNA.
2. Frame shift – a single base pair is added or deleted from DNA.
3. Chromosome mutations – mistakes that affect the whole chromosome.
4. Deletion mutation – chromosome segments break off and do not reattach itself à new cell lacks genes carried by the segment that broke off.
5. Duplication or insertion mutation – Chromosome segments attach to a homologous chromosome that has lost the complementary segment. Result one chromosome carries two copies of one gene.
6. Inversion mutations – A segment of chromosome breaks off and then reattaches itself to the original chromosome backwards.
7. Translocation mutations – A chromosome segment attaches itself to a nonhomologous chromosome.

These variations lead to adaptations. Adaptations are traits that aid a population's chance of survival and reproduction (Hoyle, 1981).

A single individual does not change by the result of evolution, while it causes the change by inherited means of growth and development that are specified for a population. When the parent inherits these changes to the offspring then they become common in that population and as a result offspring inherit those genetic characteristics for probability of survival, capability to give birth which will work until the environment changes. Eventually, the genetic changes can modify a species overall way of life, like what it eats, how to grow, how it can live. As new genetic variations in early ancestor population's preferential new abilities to become accustomed to environmental changes and so altered the human behavior causes the human evolution (John, 2007).

5. Conclusion

Science should forever support conclusions on what is seen and reproducible. So what is observed? We see variations in lizard and birds. If macroevolution occurred in between forms they never as fossils.

An alert viewer can typically see astonishing discontinuities in these claimed upward changes, as well as in the drawing above. From the time of Darwin, different excuses made by evolutionists that why the world and our fossil museums are not spilling over with intermediates. Evolution is a scientific theory in biological sciences, which explains the emergence of new varieties of living things in the past and present. Evolution accounts for the conspicuous patterns of similarities and differences among living things over time and across habitats through the action of biological processes such as mutation, natural selection, symbiosis and genetic drift. Evolution has been subjected to scientific testing for over a century and has been again and again confirmed from different fields.

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