Name : Patel Kartavya Rakeshkumar

Registration No. : 1AR/11931

Subject Name : Introductory Biology (BIO101)

Signature : K. R. Patel

Course : B. Tech - CE - Sem-2 - 2020-21

Date : 19-Apr-21

Set : 4

2. ~~i) Chromatin~~ Natural selection is a process by which living organisms adapt to environment and change.

→ There are many variations in individual of a population

→ Variation meaning that some living organisms have better traits than other living organisms and these traits are very suitable to environment than others.

→ Organism having adaptable trait are more or have more chance to survive and reproduce

→ These organisms which have good adaptive traits compared to others then pass these traits to

their offspring.

→ After long time, these traits start to increase or say more common in living organism as these are the adaptable traits.

→ Therefore In this way, process of natural selection plays role in evolution.

→ In natural selection, environmental friendly traits are transmitted to generations.

→ Natural selection can be said as "survival of the fittest".

Darwin's Theory of Natural Selection

1. over production
2. Limited Food and Space
3. Struggle for Existence
4. Appearance of Variations
5. Survival of Fittest
6. Inheritance of useful variation
7. Speciation

⇒ Modern understanding of evolution

- Darwin don't know anything related to genetics.
- Therefore the inclusion of genetics and Darwin's theory is called "modern evolutionary synthesis.
- physical and change in behaviour of organism make natural selection possible and this happens at level of DNA.
- Such changes are termed as mutation.
- It is also said that natural selection isn't only responsible for organisms to evolve, as genes can also be transferred.
- Gene transfer take place when organism migrate from one place to other or inmigrate and these process is called geneflow.
- Some time frequency of genes also changes which is termed as genetic drift.

⟹ Comparision of Darwin and Neo-Darwinism (Modern Theory)

i) What it says

Darwin - Evolution is mainly by natural selection

Neo-Darwinism - Evolution by natural selection including study of genetics

ii) Driving force

Darwin - Collection of phenotypic variations

Neo-Darwinism - Collection of genetic variations

iii) Purpose for variation

Darwin - Not explained

Neo-Darwinism - Reason is genetic recombination, mutation and natural selection

iv) Role of isolation

Darwin - No Role

Neo-Darwinism - Has major role

1. i) Chromatin : It makes the chromosome which includes DNA and protein.

- It is a packing trick to gell all of the DNA in a cell.

ii) Nucleolus: It plays key role in transcription and processing of ribosomal RNA (rRNA).

iii) Rough endoplasmic reticulum (Ribosomes attached): Function is to make proteins for cell.

iv) Smooth endoplasmic reticulum (without ribosome): It functions in many metabolic process. It synthesizes lipids, phospholipds.

v) Lysosome: They break excess or worn-out cell parts.

vi) Golgi complex: responsible for transporting, modifying and packaging proteins and lipids into vesicles for delivery to targeted destinations.

⇒ A is chromatin and make it possible for number of process including DNA replication, transcription, DNA repair and cell division.

⇒ B is rough endoplastmic reticulum and in general it produce protein for cell.

⟹ The nuclear envelope consists of an inner and outer membrane

- Outer membrane is continuous with endoplasmic reticulum and having space between it
- inner membrane is continuous with endoplasmic reticulum lumen
- RNA molecules, synthesized in nucleus, and it subunits are assembled here and exported to cytosol.
- Nuclear pore complexes provide a passageway across nuclear envelope for materials between nucleus and cytosol.
- Nuclear pore complexes mediates transportation of molecules between nucleus and cytoplasm.
- Inert proteins and small proteins having size <9nm in diameter can freely diffuse through NPC.
- opening of NPC is pluggin with biological valve which only permits selected chemicals to move in and out.
- In order to pass through NPC, a large molecule must associate with another protein called transport receptor.