UNIT V

Chapter 14

Evolution Concept Map

Ms. Jenkins

Evolution

- The theory that a species <u>changes over time</u>
  - **Evolution**- *change over time- process by which organisms have descended from ancient organisms*

Theories of Geological Change

Hutton: Rock layers form slowly; changed by wind, ice, water, etc. Earth millions of years old.

Charles Lyell- ***Lyell: Observable processes today can explain how the earth was shaped over time.***

Influence of Thomas Malthus

- Malthus Theory –
  - 1. Human suffering (Disease, famine, etc.) due to the potential for the population to grow.
  - 2. Populations can grow much faster than food supplies and resources can be produced.
  - 3. This leads to a struggle for existence.
  - **Darwin recognized this applies to ALL species.

Darwin - Who, What, When ….

1. English naturalist, born 1809, went on voyage around world as naturalist on H.M.S. Beagle in 1831.

Darwin continued – And Where ….

Studied all kinds of organisms on the Galapagos Islands and elsewhere.
Published *On the Origin of Species* in 1859

Darwin's observations:

1. Many types of organisms in same habitat, yet same habitats on different continents may not have same species
2. fossils collected may or may not resemble species he saw
3. Galapagos tortoises, marine iguanas, and finches unique to each island

Many types of organisms in same habitat, yet same habitats on different continents may not have same species; fossils collected may or not resemble species he saw; Galapagos tortoises, marine iguanas, and finches unique to each island!

Galápagos Islands Finches						
Shape of Head and Beak						
Common Name of Finch Species	Vegetarian tree finch	Large insectivorous tree finch	Woodpecker finch	Cactus ground finch	Sharp-beaked ground finch	Large ground finch
Main Food	Fruit	Insects	Insects	Cactus	Seeds	Seeds
Feeding Adaptation	Parrotlike beak	Grasping beak	Uses cactus spines	Large crushing beak	Pointed crushing beak	Large crushing beak
Habitat	Trees	Trees	Trees	Ground	Ground	Ground

Darwin

Theory of Evolution by Natural Selection

- ***Variety in nature can be inherited***
- ***Not all offspring produced survive***

Darwin

Theory of Evolution by Natural Selection

- ***Organisms compete for limited resources***
- ***Uniqueness of each organism gives different advantages/disadvantages for survival***

Darwin

Theory of Evolution by Natural Selection

- ***organisms with best advantages survive to reproduce, thus passing on their traits***

- ***species change over time (ex. size and form) because of this "natural selection " process***

Darwin cont…

Theory of Evolution by Natural Selection

- ***species alive today descended from species that lived in the past***
- ***all organisms on earth are united into a single tree of life by common descent.***

4). Common Descent –All of these things imply that there is a "**tree of life**" that links all living things on Earth

Lamarck Theory of Use and Disuse

Theory stated- Proposed that selective use or disuse of organs caused organisms to acquire or lose certain traits during their lifetime

Then these could be passed to offspring and over time could lead to a change in species

(Ex. Giraffes long necks)

What is wrong with this idea?

Evidence for Evolution Today

1. The fossil record
2. Geographic distribution of living species
3. Homologous body structures
4. Similarities in early development
5. DNA Analysis

b. Geographic distribution of living species- similar organisms in different locations were product of different lines of evolutionary descent.

Similar ecological conditions- similar pressures of natural selection

d. Vestigial structures- some homologous structures no longer serve important function. Reduced in size ("vestiges")

e. **Similarities in Early development-** similarities suggest an evolutionary relationship

Gill pouches and tails appear during early stages- remnants of structures needed by our aquatic ancestors.

During later stages- profound changes occur.

f. Biochemistry- similarities in DNA and RNA help to determine evolutionary relationships between species

Chimp chromosomes (24 pair)

Human chromosomes (23 pair)

Videostreaming Link

http://www5.unitedstreaming.com/index.cfm