



Natural Selection

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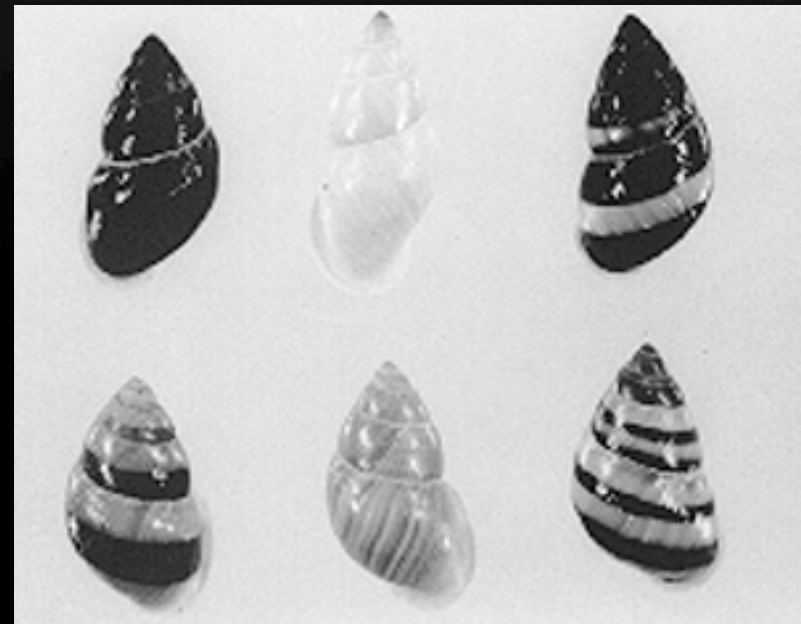
Definition of Natural Selection

- # an organism that is best suited to its environment will survive and pass on its traits to the following generations, whilst those organisms less suited to the environment will be eliminated.
- # The accumulation of beneficial traits leads to speciation.

**Natural Selection is understood
by examining these facts...**



1. There are differences between individuals of the same species.



2. Organisms compete against each other for resources.

- # Food
- # Shelter
- # Water
- # Mates



3. The 'fittest' survive.

- # The creatures that are better at achieving those resources will be healthier and survive longer than creatures that are not good at achieving those resources.
- # The differences in traits is what makes some creatures 'fitter' than others.
- # Their health allows them to reproduce more.

4. Traits are inherited.

- # The characteristics and traits that allow a healthy creature to survive will be passed on to its children.

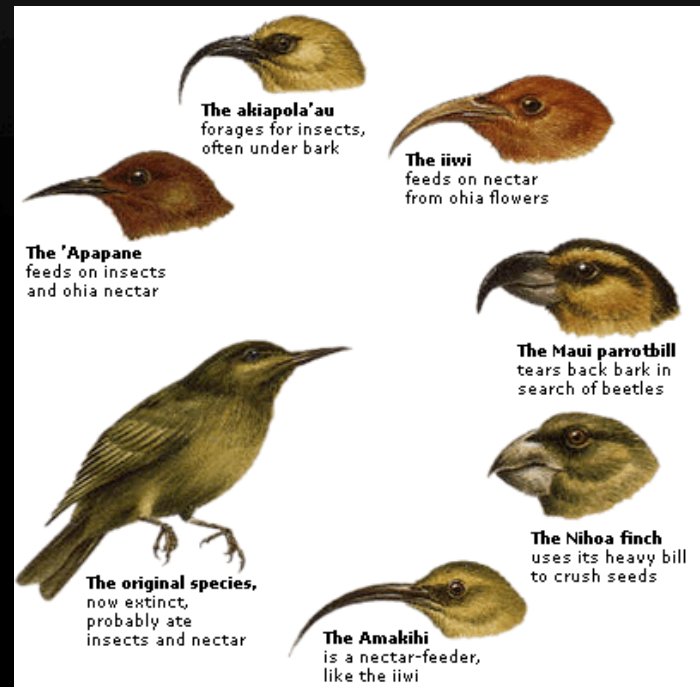


If they mated.



5. Accumulation of traits causes Speciation.

These differences in traits will add up so that creatures will appear different than their ancestors.

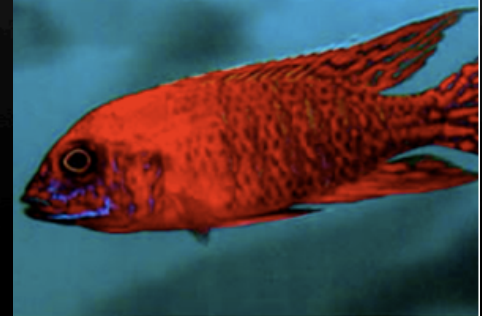


If those populations somehow become separated...

- # New environments will cause new variations to become more successful.
- # Changing environments drive evolutionary change.
- # Less food, less water, pollution, invasive species, climate change, increased population.

Speciation occurs.

This competition allows for new species to be formed through evolution.



Still sound crazy?

We will now examine some of the evidence that supports Natural Selection.



Evolution is supported by:

The Fossil Record

DNA and Genetics

Radiometric Dating Methods



What else provides the back up?

Geology

Paleontology

Anthropology

Astronomy



A Few Examples of Natural Selection

- # Elephant Tusks
- # Beach Mouse Coloration
- # Sand Lizard Coloration
- # Antibiotic-Resistant Bacteria
- # England's Peppered Moth

Elephant Tusk Lengths



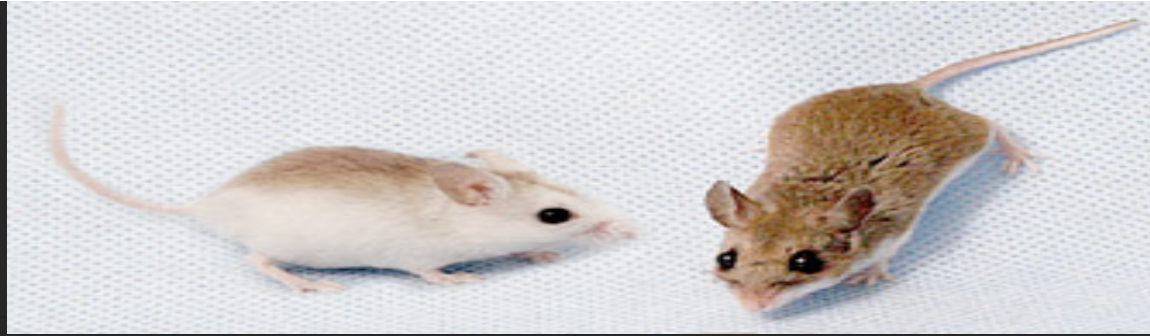
Poaching.

- # Elephants with longer tusks are harvested by poachers.
- # Surviving elephants have genes for smaller tusks in their DNA.
- # Those elephants reproduce and the offspring have smaller tusks.
- # Elephant Tusk Length has decreased measurably within a generation.

Beach Mice and Sand Lizards

- # Mice and Lizards of the same species have slightly different colorations depending on where they live.
- # Lighter colors = sandy areas.
- # Dark colors = areas with soil.
- # Why and How?





- # Mice and Lizards with sandy colorations were preyed upon less in the sandy environment, so sandy-colored coat genes were passed on to offspring.
- # Over enough time, what could happen to these species of mice and lizard?

Peppered Moths of England

- # Similar to the mice and lizards, moths of the same species inhabit an area covering a polluted forest and an unpolluted forest.
- # Moths from the polluted forest survive better if they can blend in with the darker colored surroundings.



Peppered Moths

Speciation will occur over enough time.



Evolution by Natural Selection

Explains the great diversity of life on Earth.

