

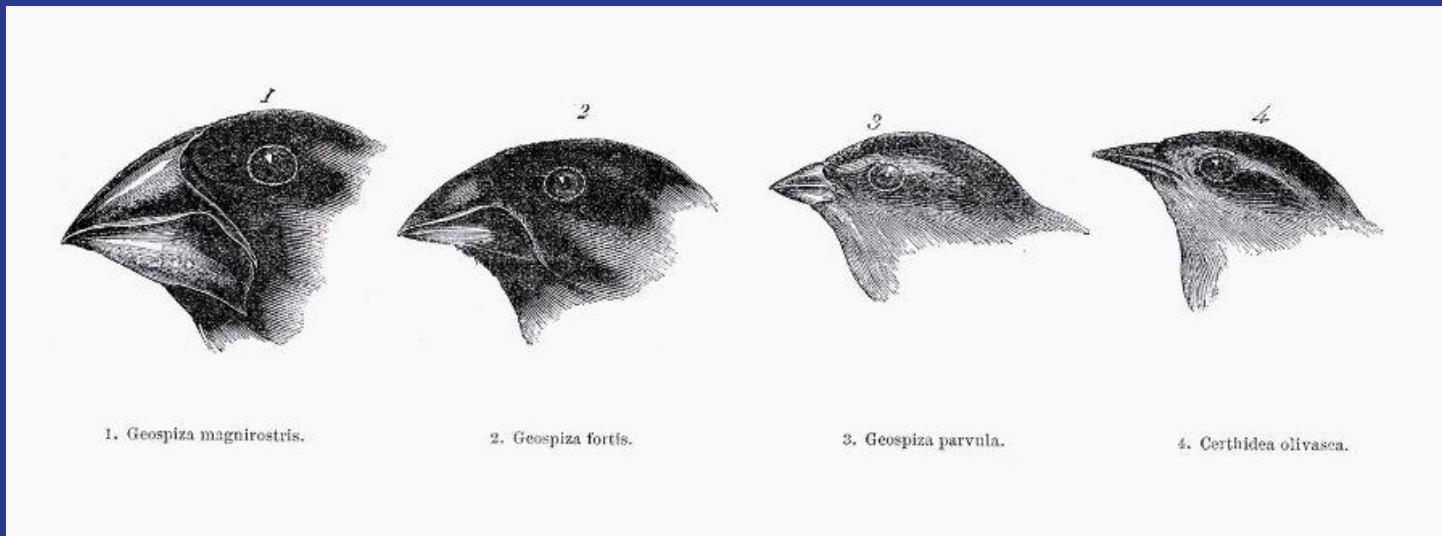
# What is Evolution?

[https://www.youtube.com/watch?v=c\\_1yHp3bmEw](https://www.youtube.com/watch?v=c_1yHp3bmEw)

# On the Origin of Species

Darwinian theory of natural selection and the development of evolutionary theory

<https://www.youtube.com/watch?v=85diEXbJBk&list=PL5270149AB732E0FB>





*Science does not establish absolute truths,  
thus its conclusions are always tentative.*

Evolution is the unifying force in modern  
biology

2 aspects to it.

- 1) the theory that all living species are the modified descendants of earlier species, and that we all share a common ancestor in the distant past. All species are therefore related via a vast tree of life.
- 2) The theories that explain the causes of evolutionary change ( Darwin : Theory of evolution by natural selection.

# Definitions of EVOLUTION:

- 1) A process that results in heritable changes in a population spread over many generations
- 2) Any change in the frequency of alleles within a gene pool from one generation to the next

## *Darwin's observations*

- 1) All species have such great potential fertility that their population size would increase exponentially if all individuals that are born go on to reproduce successfully.
- 2) Populations tend to remain stable in size, except for seasonal fluctuations.

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- 3) Environmental resources for things such as food and shelter are limited.
  - 4) Individuals of a population vary extensively in their characteristics (to the extent that no two individuals are exactly alike) which impacts upon their own ability to survive and reproduce.
  - 5) Much of this variation is genetic and is therefore heritable.

## *Inferences drawn from observations*

- 1) Due to the limited resources, there is a struggle for existence among individuals - often with only a fraction of offspring surviving through each generation to reproduce successfully.

- 2) It is not a random process that determines which individuals will reproduce and which will not. Those individuals whose inherited characteristics best suit them to their environment are likely to have more offspring than those that are not. This, by definition, is natural selection.
- 3) The unequal ability between individuals to survive and reproduce will lead to gradual evolution of the population, with favourable characteristics accumulating over the generations through natural selection.

# Conclusions

- 1) Natural selection is differential success in reproduction.
- 2) Natural selection occurs through an interaction between the environment and the genetic variability among the individual organisms making up a population.
- 3) The product of natural selection is the adaptation of populations of organisms to their environments.