Natural Selection

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Acarding to CHARLES DARWIN natural selection is the driving force of evolution. Actually it is selective force of ~~evolution~~ which promotes the survival reproduction & evolution of a better adapted gene pool of a given population at a given place in a given time period and eleminates there genes which are less suitable or less adapted to the natural condition.

Natural Selection promotes two phenomena –

① Differential Reproduction :-

More adapted population will reproduce more and more and there by increase their number and vise-versa for the less adaptive population.

② Propogation of beneficial gene :-

Gene that are having more adaptive value will spread more and more and propogate more frequently generation after generation ie gene frequencies of such genes will increase generation after generation.

Types of natural Selection

1. Stabilising Selection
2. Directional Selection
3. Disruptive Selection
4. Cyclic Selection

1. Stabilizing Selection :-

→ When natural selection favours the average & normal phenotypes & eliminates the extreme variants thereby keeping the population more or less genetically constant than this is called as Stabilizing selection.

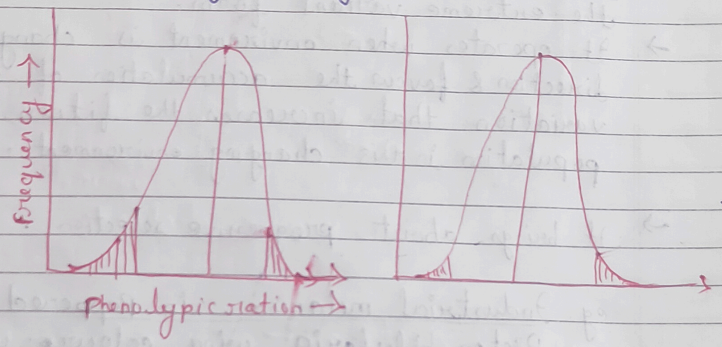
→ It acts in the absence of large scale environmental change.

→ It eliminates the extreme variants in a normal environment since the individual already adapted to the given environment.

→ It is also known as Centripetal selection.

→ It leads to the reduction in the variance of characters there by the population becomes more or less homogenous.

→ It operates very rarely.



Example – In 1899 H C BUMPUS observed that 136 sparrows injured or killed in rhode Islands due to several storm these sparrows have either larger or smaller wings sizes that the normal birds. 12 Sparrow survive having normal wings size.

2. Directional Selection :-

→ when natural selection produces a regular change within a population in on direction i.e towards a particular specific trait there is such type of natural selection is called directional selection.

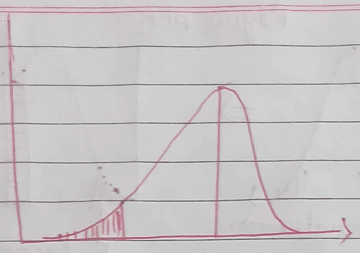
→ It favours a particular type of extreme variation & eliminates the normal one thereby

push the phenotype of the poplation towards the extreme variant form.

→ It operates when environment is changing in our direction & favour the accumulation of those variation that increases the fitness of the population in this changing environment.

→ It brings about progressive selection.

eg. Industrial melanism in Peppered moth.
Biston bilularia wing colours was grey that matches with greenish lichen covered tree trunks. until 1848 only grey colour moths were reported at england. But industrial revolution ~~at that time 99%~~ revolution at that time bring accumution of sheath on tree trunks. In 1848 1st black coloured moth was reported. Upto next 50 yrs from that time 99% of the moths had black coloured wings which was named Biston bilularia carbonaria. this was reported by E.B Ford and H.B.D Kettlewell.



Directional selection

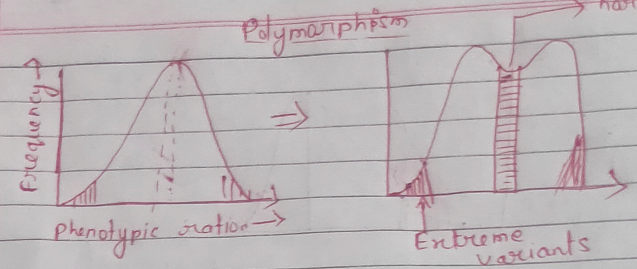
3. Diversifying selection / Disruptive selection :-

→ when natural selection acts to break up a previously homogenous population into several different adaptive form then such type of natural selection is referred to as disruptive selection.

→ It occurs, when a homogenous population is exposed to non homogenous environmental condition in different region of its distribution.

→ Disruptive Selection brings about the increase in amount of variation in the population. In other words it may result it polymorphism.

→ It supports many extreme variation and eliminates normal or average once.



Disruptive Selection

4. Cyclic Selection :-

Example - In swallow tail butterfly (Papilio - ~~gardnu~~) of Africa males have yellow and black wing with tail. Their females are without tail. These females show different types of mimicry. Each mimic is following a different unpalatable butterfly species. All these females occurs in the same area.

5. Cyclic Selection :-

→ If the environmental conditions for a given population is such that the selection operates in one direction in one season or generation followed by the selection operating in just the revers direction during next season or generation.

It leads to the cyclic variation in the phenotypic of the individual of a population.

→ It fixes all the alleles of the gene pool since different gene become benificial in one season and some different genes will be benefical in the next season.

K selection and R selection

K Selection, when the given environmen is more or less saturated with the individual then K selection operater in such population. In k selection increases the ability of ecological intraspecific competition and viability of the individual.

R selection, when the given environment is such that individual of a particular have plenty of resources to increase in number and spread than such of selection is called R selection It operates to increase to fertility and to aquired the adaptation