4.1.4 Natural Selection: Definition, Types and Examples

Natural selection is one of the most important concepts in evolution. It explains how organisms with favorable characteristics survive better and produce more offspring than organisms without those characteristics. Over time, useful traits become common in a population.

1. Definition of Natural Selection

Natural selection is the process by which organisms that are better adapted to their environment survive and reproduce more successfully than others. Charles Darwin explained that natural selection is the main mechanism of evolution.

2. Conditions Necessary for Natural Selection

For natural selection to occur, the following conditions must exist: There must be variation among organisms. Some variations must be inherited. Organisms produce more offspring than can survive. Competition for food, shelter, and mates must occur. Organisms with favorable traits survive better.

3. Types of Natural Selection

There are three major types of natural selection.

A. Directional Selection

Directional selection occurs when one extreme trait is favored over others. **Example:** Giraffes with longer necks survived better because they reached food more easily. **Result:** The population gradually shifts toward one extreme characteristic.

B. Stabilizing Selection

Stabilizing selection favors average individuals and removes extreme characteristics. **Example:** Human babies with average birth weight survive better than babies with very low or very high weight. **Result:** Average traits become more common.

C. Disruptive Selection

Disruptive selection favors both extreme traits but not the average trait. **Example:** In some bird populations, birds with either large or small beaks survive better than birds with medium-sized beaks. **Result:** Two different extreme forms increase in the population.

4. Examples of Natural Selection in Daily Life

Antibiotic resistance: Some bacteria survive antibiotics and reproduce. **Pesticide resistance:** Some insects survive pesticide spraying. **Industrial melanism:** Dark-colored moths survived better in polluted environments.

5. Importance of Natural Selection

Natural selection is important because it: Explains evolution. Helps organisms adapt to their environment. Increases survival of species. Creates biodiversity over long periods of time.

Summary

Natural selection is the process where organisms with useful inherited traits survive and reproduce more successfully. It is the main mechanism of evolution. The major types of natural selection are directional selection, stabilizing selection, and disruptive selection.

Summary Questions and Answers

1. **What is natural selection?**
Natural selection is the process where organisms with favorable traits survive and reproduce more successfully.

2. **Who explained natural selection?**
Charles Darwin explained natural selection.

3. **What is directional selection?**
Directional selection favors one extreme characteristic.

4. **Give one example of stabilizing selection.**

Human babies with average birth weight survive better.

5. **What is disruptive selection?**
Disruptive selection favors both extreme traits over average traits.

6. **How does antibiotic resistance support natural selection?**
Bacteria that survive antibiotics reproduce and pass resistance to offspring.

7. **Why is natural selection important?**
It explains evolution and helps organisms adapt to their environment.