

CHAPTER – 11

ANIMAL BEHAVIOUR

The study of animal behaviour with special importance on the behavioural patterns that occur in the natural environment is called **ethology**.

Animal behaviour is the scientific study of **organized, motive-oriented movement of animals**.

Behaviour is the tool of organisms to get around in the environment, to find suitable resources, to mate and to co-ordinate activities in groups of organisms.

Animal behaviour is broadly classified into two types, namely;

1. Innate behaviour

- a. Taxes
- b. Reflexes
- c. motivation

2. Learned behaviour

- a. Habituation
- b. Imprinting
- c. Conditioned reflexes
- d. Insight learning

1. INNATE BEHAVIOUR:

Innate behaviour is an **inborn** (inborn) **pattern of behaviour**, is controlled by genes. It is also referred as **instinct** or **inherent behaviour**.

Innate behaviour is grouped into the following types; **taxes, reflexes** and **motivation**.

- a. **TAXES:** Taxis is an automatic movement made by an animal towards or away from a stimulus.

Examples:

- i. Migration of an **earthworm** to the surface after a heavy rain.
- ii. Flight of a **moth** toward a light.
- iii. Movement of **Euglena** towards light.

- b. **REFLEXES:** Reflexes are simple, inborn automatic response by a part of the body to a stimulus.

Examples:

- i. **Blink reflex** causes rapid closure of the eyelids when an object is suddenly and rapidly approaches the eyes.
- ii. **Withdrawal reflex** of hands from the flame (painful stimulus).
- iii. Animals ran away from their predator.

- c. **MOTIVATION:** Motivation is the act or process of giving someone a reason for doing something. Behaviours which depend on internal state are said to be motivated. A specific motivation is often called a '**drive**'

Examples:

- i. **Hunger drive** (Hungry), food-deprived dog having a high feeding drive.
- ii. **Thirst**, is kind of drive in which animals show tendency to drink.
- iii. **Sex drive, nest building, brooding of eggs and care of the young.**

2. **LEARNED BEHAVIOUR:** Learned behaviour is **a behaviour that is acquired during one's life time**. They are derived from training, conditioning, punishment, rewards, etc. Learned behaviours are of following types;

- a. **HABITUATION:** Habituation is the gradual decrease in response to continuous stimulation. When the stimulus is given repeatedly, there will be gradual fading of response and animals learn to conserve energy and time by not responding to an irrelevant stimulus. **Example:**

- i. A **turtle** draws its head back into shell, when its shell is touched. After being touched repeatedly, the turtle realizes that it is not in danger and no longer retracts.
- ii. A **bird** or **squirrel** foraging near a side walk, flee the first few times a human walk past, eventually, it habituates to the human presence and ceases to respond.
- iii. A **spray** or **perfume** on your body sprayed in the morning can be smelled. After a short period, you no longer feel the scent but others around you may feel the smell of perfume.

- d. **INSIGHT LEARNING:** Insight learning refers to the sudden realisation of a solution to a problem by thought **without** any real trial or error. It is also known as **reasoning**.

Example: Kohler's Experiment on Chimpanzees

- i. In his first experiment, chimpanzee was caged and a banana was hung from the roof of the cage and a box was placed inside the cage. The chimpanzee tried to reach the banana by jumping, but could not succeed. Suddenly, he got an idea and used the box as a climbing platform and reached the banana.
- ii. In his second experiment, chimpanzee was caged and a banana was hung from the roof of the cage and this time two to three small sized boxes were placed inside the cage. The chimpanzee placed one box over the other and reached the banana.
- iii. In his third experiment, chimpanzee is caged and the banana was placed outside the cage at a distance that it could not be picked up by any one of the sticks and two sticks, one longer than the other were placed inside the cage. One stick has hallowed at one end so that the other stick could be joined into it to form a long stick. The chimpanzee first tried these sticks one after the other but failed. Suddenly, he got a bright idea; he joined the two sticks together and reached the banana.

AUDITORY COMMUNICATIONS IN GRYLLIDS:

1. Auditory communication is **the use of sound to send and receive information**.
2. The animals use sound to communicate **warnings, attract mates, signal** other individual of the same species.
3. Gryllids are **insects** commonly known as **crickets**; they belong to **family Gryllidae**.
4. Crickets sing by **scraping hardened edge of one forewing against a row of cuticular teeth on the underside of the wing**.
5. The sound of gryllids referred as **chirping**; they start chirping in late July when the crickets are old enough to mate.
6. **Male field crickets** produce '**calling song**' that is used for **attracting females for mating** to promote copulation.
7. Only males sing. A sexually receptive female, upon hearing the calling song flies towards the sound source. A behaviour known as **phonotaxis**.
8. Once the male and female come into physical contact the male switches to a distinct signal called '**courtship song**' which is part of multimodal display that **entices** (attract or tempt) the female to mate.
9. Male also sing '**rivalry song**' after winning, aggressive encounters with rivals.

PHEROMONES:

Pheromones are **chemical substances** produced by **an animal** that **influence the behaviour of another animal** of the same species. They are also referred as **external hormones**.

The term ‘**pheromone**’ was coined by **Peter Karlson** and **Martin Luscher** in **1959**.

The pheromone signals can travel for a longer distance, **even** at a lower concentration. Pheromones can be secreted to trigger many types of behaviours; **to alarm** (warning), **to follow a food trail**, **sexual arousal**, **readiness to mate**, **to tell other female insect to lay their eggs**, **to respect a territory**, **to create a bond** (between mother and baby), **to back off**, etc.

PHEROMONES IN INSECTS:

1. All insects use pheromone to **communicate**.
2. **Sex pheromones** are pheromones release by an organism to attract an individual of the opposite se to mate.

Example: Bombykol is the first pheromone was identified in 1953. Bombykol is a ‘**sex pheromone**’ secreted by **female moths of Bombyx** to attract males. Male moth can sense Bombykol and detect the female moth over 10 KM away.

3. **Releaser pheromones** are pheromones that cause an alteration in the behaviour of the recipient.

Example: When the **ants found food**, they secrete ‘**releaser pheromone**’ and they are detected as smell by other ants and reach the food.

4. **Alarm pheromones** are chemical substances produced and released by an organism that warns another of the same species of impending danger.

Example: the social insects like honey bee and termites secrete ‘**alarm pheromone**’ when attacked by predator.

5. **Aggregation pheromone** is an insect pheromone which attracts other members of the same species to a location (to assemble).

Example: attraction of thousands of bark beetles to a suitable tree, within an hour after pioneer beetle have released a pheromone at the site.

6. **Recruitment pheromone** is an insect pheromone used to coordinate the activities of the group.

Example: the worker bees of honey bee releases recruitment pheromone (called Nasonov pheromone) orients returning forager bees back to the colony. It also recruits other workers outside the hive.

7. **Host marking pheromone** is insect pheromone which marks hosts (fruit) where they have already laid eggs. Therefore, other females of the species avoid laying eggs in these marked hosts.
8. **Trail pheromones** are (short lived) chemical substances which mark a trail laid by pioneering an individual towards a source of food or refuge.

Example: ants mark their paths with trail pheromones and other individuals follow it to reach the source.

□□□□□□