

Animal Behavior

Dr. D. K. Paul

Associate Professor & Course Coordinator
M. Sc. Environmental Science & Management
Department of Zoology, Patna University

Introduction

- **Behavior** is the reactions of the organisms with the family and society in the aggregate and in the community.
- Ethology is the study of scientific, biological and specific study of behavior of animals.
- **Ethos** → Greek word → Characters/ Habit/Custom
- The term “Ethology” was coined in 1859 by the French Zoologist **Geoffroy Saint Hilaire**.

➤ **Approaches of study of animal behavior**

(a) Psychological

(b) Physiological

(c) Zoological

➤ **Controlling factors of animal behavior**

(a) Genotype

(b) Nervous System

(c) Endocrine System

(d) Pheromones

Types of animal behavior

Innate Behavior- Inborn/acquired/inherited/inherent/stereotyped

Irritability

Kinesis

- Orientation in response to stimuli without change in direction

Taxis

- Orientation in definite direction

Reflexes

- Spontaneous

Instinct or FAP (Fixed Action Plan)

- Complex behavior, vary from species to species. E.g. Parental Behavior

Motivation - The readiness or urge of an animal for a certain behavior. Internal drive/mood. It may decrease but not due to fatigue or learning e.g, Food for hungry person, sex desire.

Types of animal behavior

Learnt Behavior – Behavior attained by animals during life by experience

Habituation – Gradual decrease to response to stimuli

Imprinting- Learning in early stage of life. e.g. showing regards to elders

Conditional reflex-Exp. Bell & saliva secretion of dogs

Trial and error learning/operant learning

Reasoning (found in apes & man) & Cognitive skills (highest evolved of behavior)

Latent learning – The association of different stimuli or situations without immediate reward or punishment

Insight learning – The ability of animals to solve complex problems demanding something more than trail-error & latent learning. ex. Ability to respond the situation encountered 1st time

Innate Behavior

- In born behaviours [without obvious learning] are considered as innate behaviour.
- In other words “Behaviours that are inherent, without patent learning during lifetime are known as innate behaviour”.
- For the students of behaviour “ Behaviour that develops without obvious influence”.
- It is convenient to say the term innate for behaviour that occur without obvious environmental influence, provided it is recognised that environmental factors influence the development of all behaviours to some extent.

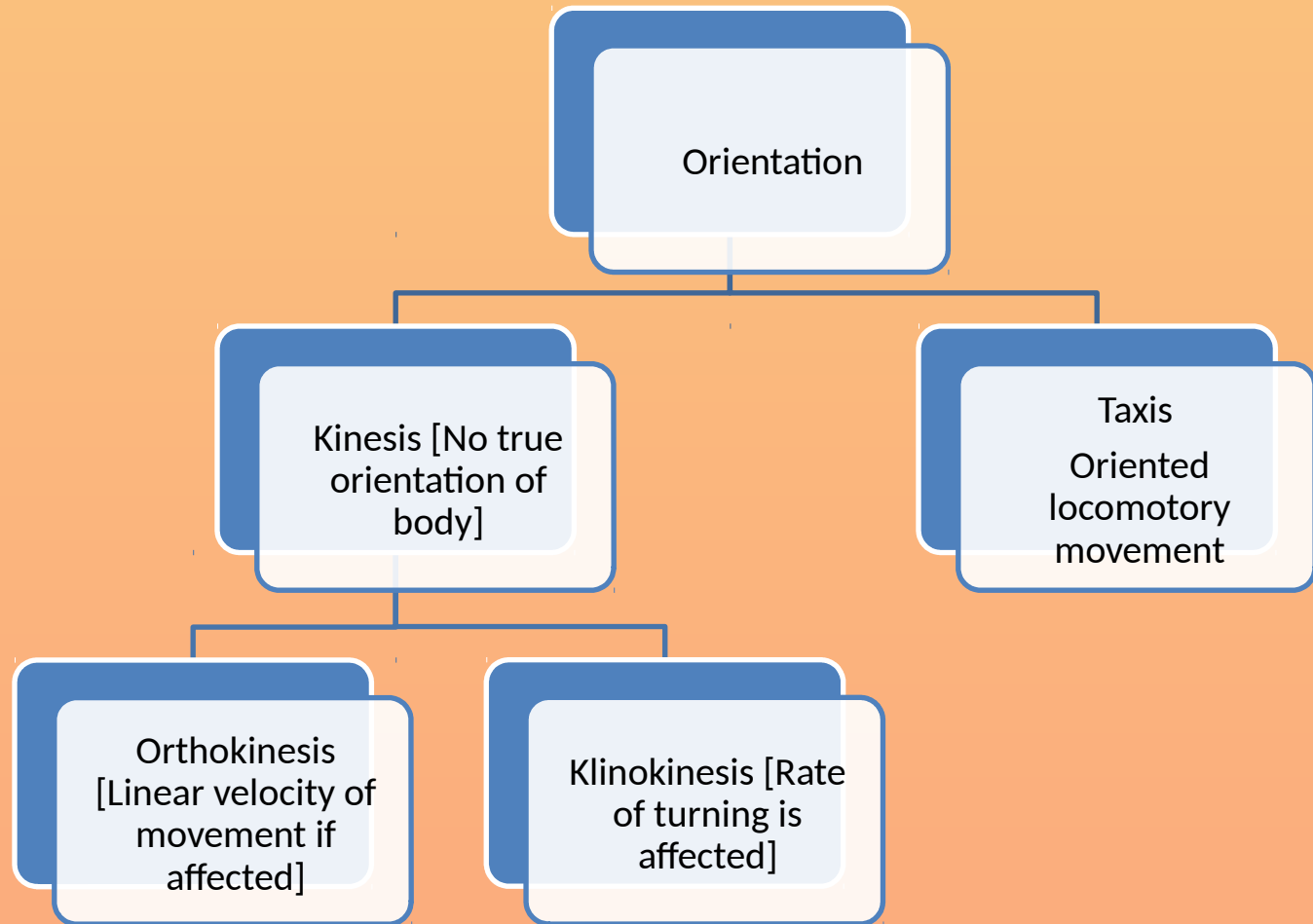
Characteristics of Innate behavior

1. It has always an adaptive value
2. It is heritable, stable under external changes
3. It is species specific. e.g. Parental care
4. Some of the behaviors are completed in seconds/minutes/hours/days/even weeks.
e.g. Migration of birds.
5. It is endogenous, i.e. originated within the animals. e.g. feeding behavior, nest building.
6. These are complex in nature.

Innate is the most controversial term in ethology. It states that certain behavioral traits are basically determined by genes. The idea that genes determine behavior is naïve, since genes cannot possibly contain detailed instructions for particular aspects of behavior. The genes may influence the processes of development in various ways, but these processes are affected also by the environmental factors. As we have seen, the genes can never depict the course of ontogeny without reference to environmental medium in which the development occurs. That's why Mc Farland (1985) defined innate behavior as “behavior that develops without obvious environmental influence”. It may be instinct, motivation, reflex, action, irritability etc.

Kinesis/Taxis

Kinesis and taxis are the part of orientation
Orientation is spatial arrangement of animals in the environment.



Taxis

On basis of direction

Positive

Negative

On basis of direction

Hydrotaxis

Thermotaxis

Phototaxis

Thigmotaxis

Chemotaxis

Galvanotaxis – Electric field

Geotaxis – Gravity of earth

Rheotaxis

Geomagnetictaxis – Earth's magnetic field

On the basis of relationship of stimuli and receptor

Klinotaxis – against successive comparison of stimuli

Tropotaxis – No successive comparison

Telotaxis – Goal directed

Menotaxis – A form of telotaxis, light compass direction, constant angle by negative feedback

Mnemotaxis – Based on memory [Postulated by Kuhn]

On the basis of function[Shone,
1965]

Orientation in space [by sense organ]

Stability of posture and movement by
mechanical sense organ

Object orientation - may be local or distance

Strato orientation movement across the
vertical layer

Zonal orientation the vertical layer level

On the basis of spatial nature of environment

Positional Orientation

Object Orientation

Strato Orientation

Zonal orientation

Topographic (Complex, depends upon distance, direction, landmarks) (animals trace in path)

Geographic - great distance - migration

Special types of orientation

Echolocation in bats, also in dolphins

- Echo sound
- Intensity

Languages of honeybees (Karl von Frisch)

Round Dance or Rund tanz

Tail wagging or Waggle dance or Schwanzzeitanz

Geographic - great distance - migration-

**NURTURE THE NATURE
FOR OUR FUTURE**

Thank you