UNIT -5

Animals

Introduction

- The word animals comes from Latin word ‘animals’ meaning vital breath or soul.

Major characteristics of animals

- ❖ They are multicellular, eukaryotic and heterotrophic mode of nutrition
- ❖ They have no chloroplast and cell wall.
- ❖ They can reproduce either sexually or asexually
- ❖ They exibit locomotion
- ❖ They have nervous system.

Diversity of animal

- Animal are divers in size type and distribution
- Based on the presence and absence of back bone animals can be divided in to two these are.

1. **Invertebrate Animal**
   - Are animal with out back bone
   - Based on number 98% of the species are covered b invertebrate
   - Have small size

   Example flat worms round worms, snails, some insects

2. vertebrate animals

- are animals with have back bone

- only 2% of animal species are covered by vertebrate

- have large size

Example Human, snake, fish, bird etc

- Animals are different in size from very large (elephants) to very small animals (rat) and housefly is smaller than both.
  How are animals distributed?
- Animals live in various environment such as land, sea, air, forest, soil etc.

- **Terrestrial animal:** are animals that live on lands
  example cattle, lion, Human etc
- **Arboreal Animal:** are animal living on the branch of tree in the forest example Monkey
- **Aquatic Animal** are animal which live in water
  example whales, fish etc
- **Aerial animal:** are animal living on air
  example birds and Bats
- **Amphibians:** are animal living both in water and on land
  example frog
- **Reptiles** are animals living on land moved by crawling and with horny scale covered the body
  example snake
- **Mammals:** are animals which the female give birth to live young and can feed them with their own
  Example cow, sheep, human etc

Why are insects are the most diverse group of animal

- Insects are the most diverse group of animal on the planet
- The major reason for insects the most diverse group of animal are:
- They are able to live in different habitat.
- They are able to adapt different physical condition
- They are able to adapt changing condition
- They are able to reproduce rapidly.

Life Histories of Some insects

Insects

- Insects are the most diverse group of animals on the earth
- The word insects comes from Latin word “insectum” meaning cut into section.
- They have segmented body supported by exoskeleton (a hard outer covering made of mostly chitin (chitin us exoskeleton)
- The segmented body are organized in to head, thorax and abdomen

1 Head: consist of Antennae, pair of compound eye, may be simple eye and mouth part.

2. **Thorax:** contain three segments and six segmented leg, two or four wings.

3. **Abdomen :** contain eleven segments

- Contain important structure for digestion, respiratory excretory and reproductive internal part.

Metamorphosis

- Metamorphosis is a fundamental difference insects and other animals, their bodies are completely change their form this process is called metamorphosis
- Metamorphosis is a complete change of body
- There are two types of metamorphosis in insect

1. **Complete metamorphosis:** involves a complete change of form, involving four stages i.e
   Egg → larva → pupa → Adult
2. **Incomplete metamorphosis:** involves a gradual development involving only three stages i.e
   egg → Nymph → Adult

- The nymph closely resembles the adult except it is smaller and wingless

Incomplete metamorphosis

- What are the process takes place in the life cycle of grass hoper?
- The desert locust is a species of grass hoper no lineal stage
- The egg hatch in to nymphs (wing less)
- Nymph shades its outer cover (cuticle)
- The stage between each molt is called instar **molt** is the removal of outer body cover.
- For the first instar, the nymph are called “hoppers” and move by crawling or hopping along the ground since they have “no wings”
- After developing wings the nymph become on adult

Instar: each stage between moults of incomplete metamorphosis in insect life cycle

Nymph: wingless stage hatching out from egg, which is look like, adult except it is small
Hatch keeping warm until young break out of egg
Larvae an active feeding warm like stage of life coming out of egg in insect.
Pupa the in active non- feeding stage of life after larval stage in insect.

Complete metamorphosis

- Is the complete change of forms involving four stage ‘
  Egg → larvae → pupa → adult
  Example Butter flies
  Stage of complete metamorphosis in butter flies

- Butter fly lay its egg
- Egg hatch in to larvae called cater pillar

- The larvae moult its cuticle (outer layer)
- Cater pillar develops in to pupa
- Finally the pupa emerges out the cuticle and become an adult butterfly

Cater pillar: is the larval stage of complete metamorphosis

some economically important insects

- Insects are economically important in both useful and harmful a suspects. Insects such as tsetse fly dark moth and Mazie stock bores moth are economically harmful

Tsetse fly

- Tsetse fly is a harm full pest that affect both cattle and people
- Tsetse fly is a vector of the diseases known as Trypanosomiasis or tryps (sleeping sickness in human and Gendi in cattle)

❖ **Vector** is a carrier of diseases causing organism an agent for transmitting diseases

❖ **Symptom** -fever
- progressive anemia (is a diseases of blood)
- loss of weight

❖ **Habitat** found along the edge of lakes and bank of livers

Methods of controlling tsetse fly

- Spraying insecticides on the shelter area of tsetse fly
- Trapping tsetse fly by traps
- Removing bushes and
- Spraying livestock with insect repellent

❖ **Insecticides** : are chemical substance used to kill insects

Army worms

What is Dark moth (Army worm)

- Army worm are cater pillar that move in mass armies and consumes grass on their way
- Army worm are worms that are capable of flying at larval stage and its larval stage is also known as caterpillar like butterfly
- Caterpillar can be hairy, spiny and have unusual shape

❖ They have large powerful jaws adapted to cut and chew leaves

❖ Caterpillar are very greedy eaters and cause much damage to agricultural crops (Teff, Maize, sorghum rice, wheat, millet etc)

❖ They do not attack vegetables, tea and coffee

Methods to control Army worm

- Use moth trap to protect infestation
- Using cut branches from tree to “brush” the caterpillars

- Driving hard of cattle, sheep and goat a cross the affected area
- Collecting larvae by hands
- Spraying pesticides etc

Maize stalk Borer Moth

- Mazie stalk Borer moth is a species of moth that is also known as the maize stalk borer
- It is also known as “Ageda Korkur” in Amharic
- The adult have pale brown color
- The larvae feed on various grass, sorghum and sugarcane they lay their egg on the stem, under leaf sheath which are hatched for 10 days
- The larvae are called caterpillars
- They cause the shoot of plant may turn to yellow and die. If the plant dies, the caterpillar will move to an other plant.
- They cause more serious damage to plants like maize than sorghum and sugarcane.

Social insects

- Insects that live together in communities or colonies are called social insects. The main groups of social insects are bee, ants and termites
- Social insects live together in larg group or colonies and share out the work needed to sustain the colony between them. Different casts of insects carry out different buties with in the colony.
- All social insects posses the following common characteristics
    - ❖ Large population (colonies)
    - ❖ Elaborate nest
    - ❖ Parental care
    - ❖ Protective device
    - ❖ Swarming
    - ❖ Communication and
    - ❖ Division of work

The Honey Bee

- Honey bees are insects that makes honey
- Some groups bees do not live in group they are solitary
- Most of the bees are social insects which live in groups
- The social honey bee consist of three castes or types
  These are – Queen bee
  - Drone bee and

- Worker bee

i) The Queen Bee

- The queen is fertile female with fully developed a varies and fertile foe her life time.
- she is large than worker but not as longer as drone
- There is only one queen bee per hive
- A queen bee can live for 3-5 years.
- The queen mate with several male bees (drones)

_ She lays up to 2000 eggs per day

- The fertilized egg become female (worker bee) and the unfertilized egg become male (drone bees)
- When she dies or become un reproductive the other bee will “make” a new queen by selecting a young larvae and feeding it a diet of “Royal Jelly”
- For queen bees, it takes 16 days from egg to emergence.

ii Worker Bee

- All worker bees are female, but they are not able to reproduce/ not fertile/ not reproduce.
- They are known as sterile female bees
- They have varied life span with season, i.e they live for long during the winter time (4-9 months) But shorter during summer (only6 week) which is their busy time they litrally work themselves to death
- Nearly all of the worker bees in a hive are worker bee
- A hive consist of 20,000-30,000 bee in the winter and over 60,000-80000 bee in the summer.
- The worker bee sequentially take on a series of a specific tasks during their life time.

❖ **Nurse**: clean out the cell and feed the larvae
❖ **Builder**: build new comb and egg and the larvae
❖ **Solder**: defend of fighting the hive against enemies
❖ **Food gatherer**: collect nectar and pollen from flower

Periods of work activity of worker bees

Period	**worker Activity**
Day 1-3 →	cleaning cell and incubation
Day 3-6 →	feeding older larvae
Day 6-10 →	feeding younger larvae
Day 8-16 →	reliving honey and pollen from field bees
→	

- For worker bees, it takes 21 days from egg to emergence the worker bee has a barbed stinger that results in her death following stinging
- She can only sting once.

iii Drone bee

- The drone bee are the fertile male which are formed from unfertilized egg
- They are shorter, thicker and bulkier than the queen
- They are keept stand in summer to the hive for mating with a virgin queen
- Drone has a boarded sexorgan, mating is followed by death of the drone
- They are only 300-3000 drone in a hive
- The drone does not have a stinger
- They are not found in hive with in winter and they are expelled from the hive in the autumn
- They do not produce honey or wax.

How do Honey bees Communicate?

- A honey bee that discovers a new food source will tell other honey bees about its location through the honey bee dance. When a worker bee return from an
  abundant food source, she will dance inside their nest in circle the dancer waggles her abdomen while crossing the circle made by round dance.