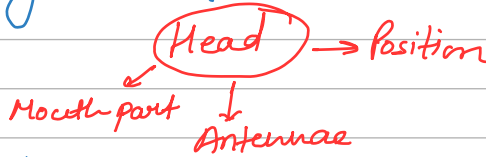


Study plan

1. Introduction
2. Classification / Taxonomy Insects

3. Insect Morphology → Body wall



4. Thorax → Legs
 → Wings

5. Abdomen.

6. Body system -
- ✓ Reproductive system
 - ✓ Respiratory system
 - ✓ Circulatory system
 - ✓ Excretory system
 - ✓ Digestive system
 - ✓ Endocrine system

7. Metamorphosis

8. Pest population concepts

- ✓ DB
- ✓ ETL
- ✓ EIL
- ✓ qEP

9. Types of Pests. ÷

10. Major pests (Insects).

11. IPM

✓ (Integrated Pest Management).

12. Insecticides

13. Stored Grain pests

14. Rodents → Nematodes.

①

Insect

- ✓ Derived from Latin word. (Insectum)
↳ Break Into
- ✓ 1 pair of Antennae
- ✓ 2 pairs of wings
- ✓ 3 pairs of Legs

Pests

- ✓ Pest is a broader term which include ✓ weed
- ✓ Insects ✓ Pathogen ✓ Rodent
- ✓ Nematodes, etc.
- ✓ Any organism which cause economic damage is pests.

All pathogens are pests ✓

All pests are insects. ✗

Keep

→ Kingdom

→

Animalia

Put

→ Phylum

→

Arthropoda - Greek
↳ Jointed Legs

Clear

→ Class

→

Insecta / Hexapoda

otherwise

→ Order

→

—

family

→ Families

→

—

Get

→ Genus

→

—

sick

→ Species

→

—

Lecture . 2. → Classification of Insects.

Q. • who give the first classification of insects??

→ Linnaeus. → divided 7 orders.

Q. widely accepted classification

→ AD Imms. → 29 orders. Insects.

Keep → Kingdom → Animalia

Pot → Phylum → Arthropoda - Greek
→ Jointed Legs

Clear → Class → Insecta / Hexapoda (6 legs.)

otherwise → Order → —

family → Families → —

Get → Genus → —

sick → Species → —

• Phylum → Arthropoda has 7 classes.

1. Onychophora

2. Crustacea

3. Chilopoda

4. Diplopoda

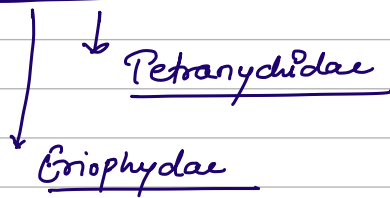
5. Trilobita

✓ 6. Arachnida
✓ 7. Insecta / Hexapoda.] - Important in Agriculture.

✓ Arachnida Class.

↳ order → Acarina.

2 sub class



→ Tetranychidae

- ✓ Phytophagous mite have 4 pairs of legs.
- ✓ Eg. Red spider mite / cucurbitace mite.

→ Eriophyidae . ∴

- ✓ Small size, worm like, microscopic
- ✓ 2 pairs of legs
- Eg. Eriophyid mite (sterility in moraic Arhar).

Sub phylum of Arthropoda.

✓ Uniramia



2 sub classes of class Insecta are :-

! Ptera = wings.

Apterygota.

↳ Absent wings

4 orders.

- P - Protura → Antennae X
- T - Thysanura → Silver fish
- C - Collembola
- D - Diplura

Pterygota.

↳ Present wings

25 orders.

Pterygota

Endopterygota

↳ in wings.

↳ out wings
Exopterygota

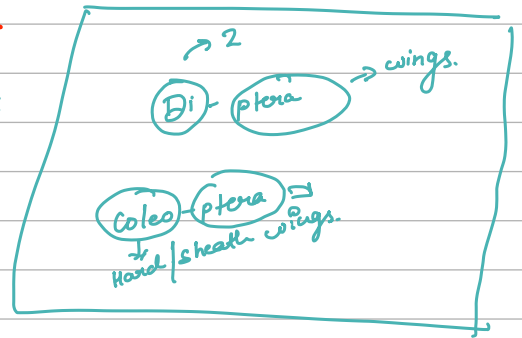
Exopterygota (Order):

- ✓ Isoptera — Termites (Because wings same size).
 - ✓ Zoroptera — Hubbards angel insects
 - ✓ Hemiptera — Bugs, Aphids, whitefly
 - ✓ Thysanoptera — Thrips
 - ✓ Dermaptera — Earwigs
 - ✓ Siphonculata — Lice
 - ✓ Odonata — Dragonfly
 - ✓ Ephemeroptera — Mayflies.
 - ✓ Orthoptera — Grasshopper, locusts
 - ✓ Dictyoptera — Cockroach, Mantis
- ↓
2 sub orders.
- ✓ Blattodea → Cockroach
 - ✓ Mantodea → Mantis

Endopterygota

Examples

- Hymenoptera → Ants, bees & wasps
- Diptera → Flies
- Lepidoptera → Butterfly & moths.
- Longest order → Coleoptera → Beetles & weevils
- Neuroptera → Lacewings.



Hemiptera — 2 sub-orders.

Hemi → half. wings are soft and half strong (hard).

Hemiptera

Homoptera

same wings

- ✓ Aphids, whitefly
- ✓ Jassids, Hoppers

Heteroptera

different wings.

- ✓ Bugs.

Assignments.

Make tables of orders: Examples.