

ORDER: COLEOPTERA

Coleo = sheath, pteron= wing
Includes Beetles and weevils



- **largest order in class insecta and Animalia** with **about 330,000** Species
- **Frons and vertex** are prolonged in to **snout** as in weevils
- Ventral floor of head is represented by **Gular sclerite** except in all weevils
- The mandibles attain their greatest length in the males of **the stag beetles (Lycanidae)**
- Forewings are **horny or leathery elytra** which always meet to form a straight mid dorsal suture
- Hind wings membranous and are **highly reduced in weevils and few beetles**
- **First tergum membranous** and one or more of the sterna from the first to third are aborted
- Last abdominal segments are **refractile and tubular, function as ovipositor** (eg: cerambycidae)
- The larvae are known as **grubs**
- Adults possess stridulatory organs on **Mandibles and maxillae in Scarabidae** and **on prothorax mesonotum in Cerambycidae**
- **Pygidial glands** open near anus which are **defensive** in function
- Malphigian tubules are **cryptonephric** in condition



Coccinellidae: Lady bird beetle

- **Convex dorsally and horizontal ventrally**, brightly coloured or spotted
- **Head partly concealed under pronotum**
- Tarsal formula is **4:4:4**
- Grubs covered with minute tubercles or spines known as **setose or rugose**
- Elytra covers the abdomen completely
- Both adults and grubs are **highly predacious feeding on aphids, coccids, mites, psyllids**
- Genus epilachna are phytophagous

Eg. Predator on aphids – *Menochilus sexomaculata*

Predator on cottony cushion scale-*Rodalia cardinalis*

Lady bird beetle on brinjal -*Henosepilachna vigintioctopunctata*



Bruchidae: Pulse beetles or seed beetles

- The head is produced anteriorly in to a **short and broad snout**
- Antennae **serrate or pectinate**
- Elytra shortened, **never cover the tip of abdomen**
- Tarsal formula is **5:5:5**
- Larvae usually undergo **hypermetamorphosis**
- First instar with **well developed legs and toothed thoracic plates** to aid in entering into seeds
- After first moult it becomes **partially / wholly apodous**

Eg. Pulse beetles: *Callosobruchus chinensis*

Callosobruchus maculatus



Scarabaeidae: horn beetles, dung rollers, chaffer beetles

- Head often slender, recurved, sometimes toothed or **bilobed frontal horn**
- Antennae **lamellate type**
- Prothorax large simple or with **horny structure**
- Elytra not usually completely covering the abdomen
- Grubs typically **scaraboid and feed on roots known as root grubs**
- Tarsal formula **5:5:5**, the hind tibiae more or less dilated with the outer edge toothed
- Adults usually feed on **dung and on palm trees** or **organic matter** living in manure pits

Eg. *Oryctes rhinoceros* – Rhinoceros beetle



Chrysomelidae: Flea beetles, leaf beetles

- Upper surface bare and shining, frequently with **metallic colouration**
- Tarsal formula is **5:5:5**
- Adults generally feed on leaves causing **numerous holes** and also on flowers
- Some grubs feed on foliage, some act as leaf miners and some feed on roots and stems

Eg: Sweet potato tortoise beetle - *Metriona circumdata*

Rice hispa - *Dicladispa armigera*

Pumpkin beetles - *Raphidopalpa foveicollis*



Lachnaia sexpunctata
9 - 13 mm



Cryptocephalus sericus
7 - 8 mm



Crioceris duodecimpunctata
5 - 6,5 mm



Cheilotoma musciformes
3 - 5 mm



Chrysomela vigintipunctata
6,5 - 8,5 mm



Donacia crassipes
9 - 13 mm

Cerambycidae: Long horned beetles

- antennae 2/3 of the body inserted on **prominent tubercles**, capable of **flexing backwards**
- Prothorax is spined or tuberculate
- Tarsal formula is **5:5:5**
- Most of the grubs are **tree borers**
- Few are confined to **roots with powerful mandibles boring** into deep and hardwood
- Most of the adults feed on flowers and some produce squeaking sound when picked up

Eg. Mango stem borer - *Batocera rufomaculata*

Grapevine stem gridler - *Sthenias grisator*

Longicorn beetles on cucurbits - *Apomycina pertigera*



Curculionidae Weevils, snout beetles

- Head prolonged to form a pronounced **snout or rostrum** of variable length and shape
- Head exhibits **sexual dimorphism** being **better developed in females** for boring eggs
- Antennae **geniculate** arising about the middle of the snout
- Mouth parts small and **arranged at the end of the snout**
- **Elytra are attached together**
- Adults and larvae are phytophagous and **stored grain pests**
- Larvae usually **apodous**

Eg: **Red palm weevil - *Rhynchophorus ferrugineus***

Rice weevil - *Sitophilus oryzae*

Apionidae

- Antennae clavate, rarely geniculate

Eg. **Sweet potato weevil – *Cylas formicarius***

