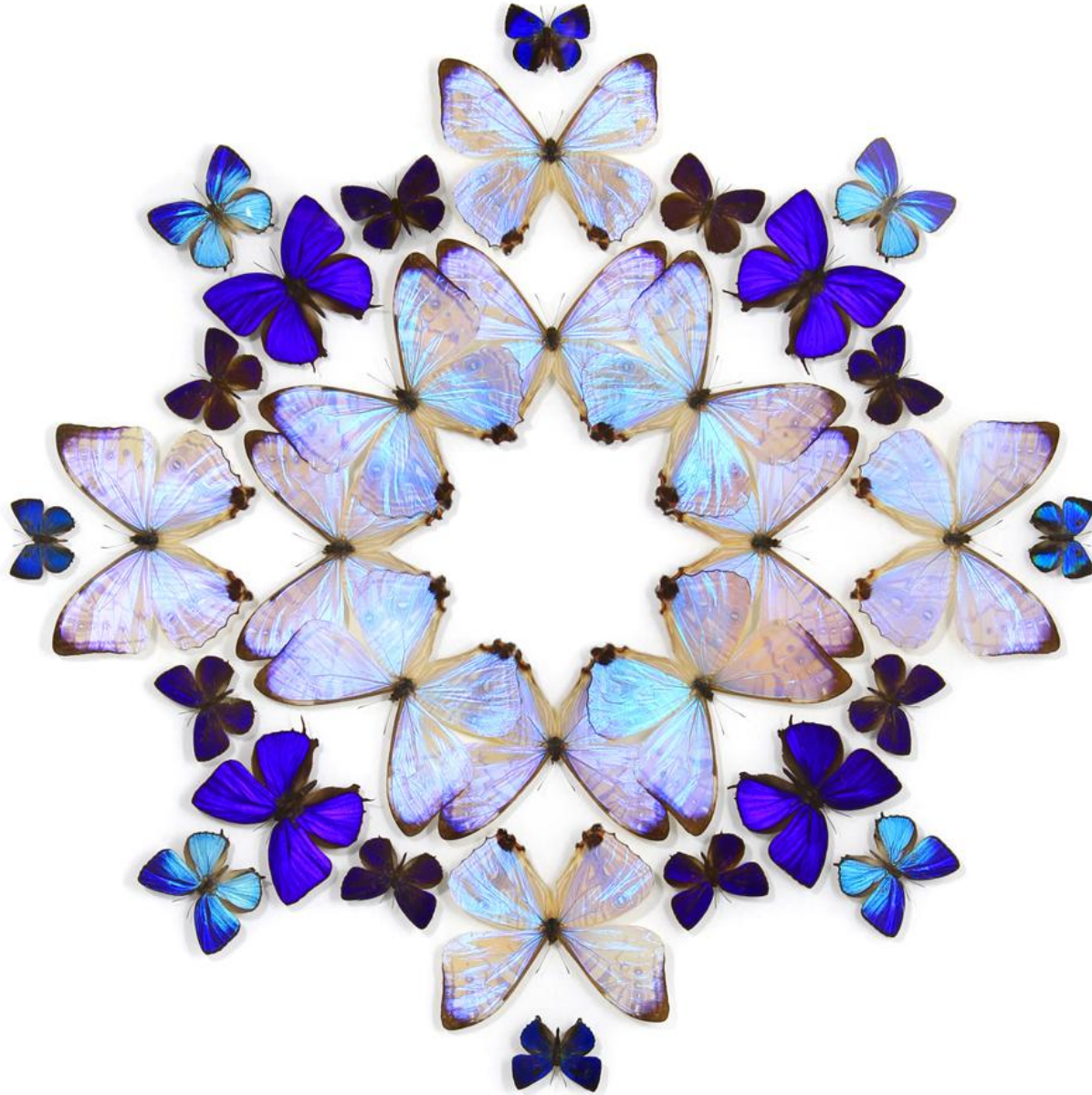


Order Lepidoptera



ORDER: LEPIDOPTERA Lepido = Scales; Pteron = wing

- Includes Butterflies and Moths

Mouthparts **siphoning type** - a long coiled proboscis formed by the **galeae of maxillae**

Mandibles nearly always lacking except in **family micropterygidae**

Wings are **scaly** and Forewings usually large

In males, specialized scales, **androconia** on upper surface of wings serves as outlets for odoriferous glands

Larvae are called **caterpillars** usually **eruciform**

Most of the larval stages are **phytophagous** and are very serious pests of crops

Mouth parts **mandibulate** with well developed mandibles

Labium with a **spinneret**, a median process for spinning silk

Abdominal segment **3 to 6 and 10th** usually bear a pair of **prolegs** which are fleshy and broad bears a number of tiny hooks known as **crochets** at their end

Caterpillars have well developed silk glands and are usually **peripneustic**

Pupae are usually **obtect** and generally enclosed in a cocoon

Butterflies do not Make a cocoon and their pupae are called **chrysalis**

Adults are harmless except **fruit sucking moths**

Natural silk is a product of this order

Differences between moths and butterflies

Character	Moths	Butterflies
Behaviour	Nocturnal	Diurnal
Antennae	Pectinate, plumose	Clavate
Ocelli	Present	Absent
Mandibles	Present	Absent
Frenulum	Present	Absent
Humeral lobe of hindwings	Undeveloped	Greatly developed
Wings at rest	Held roof like over body	Folded vertically upward
Cu ₂ vein of forewing	Present	Absent
Abdomen	Large and stout	Comparatively small and slender
Pupa	Obtect pupa within a cocoon	Obtect pupa without cocoon. It is a naked pupa brightly coloured and supported by silken girdles, called as chrysalis

Family : Noctuidae Noctuid moths, army worms, cutworms etc

- The forewings cryptic and some are **coloured similarly with the surrounding**
- In forewing **M2 arises close to M3 than to M1**
- Cubitus appears **four branched**
- In hind wings Sc and R fuse for very short distance at the **base of the discal cell**
- In the larvae, crochets are generally in a **uniordinal series**
- In some 1st or 1st and 2nd pairs may be aborted and the larvae are **semiloopers**
- Most of them are **highly polyphagous and nocturnal**
- They are called **army worms / cut worms** by their habits
- Adults have a pair of well developed **tympanal organs at the base of abdomen**

Eg: Climbing cutworm of paddy - *Mythimna separata*

Redgram podborer - *Helicoverpa armigera*

Tobacco cutworm- *Spodoptera litura*

Fruit sucking moth of citrus - *Othereis fullonica*



Family: Lymantriidae Tussock moths and gypsy moths

- females of most species having **rudimentary wings** (Notolophus sp) **proboscis is atrophied**
- Antennae **bipectinate** in males and **pectinate or plumose** in females – **sexual dimorphism**
- Sc and R fused to some extent
- Caudal extremity of females has **large tuft of anal hairs** deposited on egg masses
- Caterpillars are **densely hairy**
- **Osmeteria** are present on **6th and 7th abdominal** segments
- Some are provided with **urticating hairs** which cause irritation
- Pupa are characterized by **specific evident setae**

Eg. Yellow hairy caterpillar on Paddy – *Psalis recuris*

Hairy caterpillar on fruit trees, pulses and castor – *Euproctis fraterna* and *E.Scintillans*

Casuarina hairy caterpillar – *Lymantria incerta*



Family: Sphingidae Sphinx or hawk moths or horn worms

- heavy bodied powerful with **spindle shaped body** tapering both anteriorly and posteriorly
- Proboscis is very long and attains its **greatest length** in the family
- Usually the adults produce sound by **forcing air through proboscis**
- Sc and Rs in wings connected by a cross vein near **middle of discal cell**
- Larvae have a horn on dorsum of 8th abdominal segment, longer in 1st instar -**horn worms**
- Eg: Gingly deaths head (robs honey from honey comb) *Acherontia styx*
Sweet potato sphinx - *Herse convolvuli*



Family: Pyralidae Snout moths

- Labial palpi well developed and projected forward appearing as a **snout** in front of the head
- Forewings elongate or triangular with **cubitus appearing four branched**
- Hind wings are usually broad with **SC and R usually close together, fused**
- Generally internal feeders- **Borers**
- Adult females have a **tuft of anal hairs** deposited as a covering on the egg masses

Eg: Paddy stem borer-*Scirpophaga incertulas*

Jowar stem borer-*Chilo partellus*

Brinjal shoot and fruit borer-*Leucinodes orbonalis*



Family: Gelechiidae

1. Labial palpi are long and curved, the terminal segment is long and pointed
2. The venis **R4 and R5** in the forewings are stalked at the base
3. Forewings are **trapezoidal and narrower** than the hind wings
4. Hindwings usually have the curved outer margin and **RS and M1 stalked**

Eg: Angoumois grain moth -*Sitotroga cerealella*,

Cotton pink boll worm - *Pectinophora gossypiella*

Groundnut leafminer – *Aproaerema modicella*



Family: Arctiidae -Tiger moths or wooly bears

- **Sc and Rs in hind wings are usually fused** near or beyond the middle of the discal cell
- Caterpillars are called **wooly bears** since densely hairy and curl into compact mass when disturbed
- Many species are capable of producing sound
- Pupation in cocoons made of **silk and larval body hairs**

Eg: Red hairy caterpillar - *Amsacta albistriga*

Black hairy caterpillar - *Pericallia ricini*

Sunhemp hairy caterpillar - *Utetheisia pulchella*



Family: Papilionidae Swallow tail butterfly

- Have **tail like prolongation** in the hindwings
- Cubitus in the forewings appears **4 branched**
- Larva is smooth with a series of **dorsal tubercles** or a raised prominence on the 4th segment
- Pupa, characteristic in having **two lateral cephalic projections**

Eg: *Papilio demoleus*, *Papilio polytes* -Citrus butterflies

