

Taxonomy of Insects

Lecture (8)

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Lecture Topics

- **Order: Lepidoptera**

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Endopterygota (Order: Lepidoptera)

Life history and Ecology

- Lepidoptera (moths and butterflies) is the second largest order in the class Insecta.
- Nearly all lepidopteran larvae are called caterpillars.
- They have a well-developed head with chewing mouthparts. In addition to three pairs of legs on the thorax, they have two to eight pairs of fleshy abdominal prolegs that are structurally different from the thoracic legs. Most lepidopteran larvae are herbivores; some species eat foliage, some burrow into stems or roots, and some are leaf-miners.

Endopterygota (Order: Lepidoptera)

Life history and Ecology

- Adults are distinctive for their large wings (relative to body size) which are covered with minute overlapping scales.
- Lepidopteran wing scales often produce distinctive color patterns that play an important role in courtship and intraspecific recognition.
- In lepidopteran families, the mouthparts are vestigial or form a tubular proboscis that lies coiled like a watch spring beneath the head. It uncoils by hydrostatic pressure and acts as a siphon tube for sipping liquid nutrients, such as nectar, from flowers and other substrates.

Endopterygota (Order: Lepidoptera)

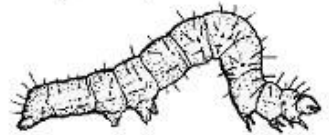
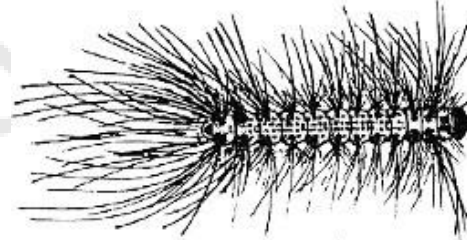
Life history and Ecology

From a taxonomic standpoint, the distinction between moths and butterflies is largely artificial — some moths are more similar to butterflies than to other moths. As a rule, butterflies are diurnal, brightly colored, and have knobs or hooks at the tip of the antennae. At rest, the wings are held vertically over the body. In contrast, most (but not all) moths are nocturnal. They are typically drab in appearance, and have thread-like, spindle-like, or comb-like antennae. At rest, their wings are held horizontally against the substrate, folded flat over the back, or curled around the body.

Endopterygota (Order: Lepidoptera)

Appearance of Immatures

- Eruciform (caterpillar-like)
- Abdomen with up to 5 pairs of prolegs
- Head capsule well-developed, with chewing mouthparts



Appearance of matures

- Mouthparts form a coiled tube (proboscis) beneath the head
- Butterflies Antennal type: knobbed or hooked at tip
- Moths: Antennal type thread-like, spindle-shaped, or comb-like
- Front wings large, triangular; hind wings large, fan-shaped
- Body and wings covered with small, overlapping scales

Endopterygota (Order: Lepidoptera)

Classification

Butterflies

- **Nymphalidae** (Brush-footed butterflies) the largest butterfly family.

- **Danaidae**

Milkweed
Butterflies



Danaidae



Geometridae



Hesperiidae



Lycaenidae

- **Hesperiidae**

Skippers



Nymphalidae



Noctuidae



Papilionidae



Pieridae

- **Papilionidae**

Swallowtail
Butterflies



Riodinidae



Saturniidae



Sphingidae

- **Pieridae**

Whites and Sulfurs

Endopterygota (Order: Lepidoptera)

Classification

- **Arctiidae**

Tiger moths

- **Noctuidae**

Underwing
moths

- **Saturniidae**

Silk moths

- **Sphingidae**

Hawk moths

TYPES OF MOTHS



Hummingbird
Hawk-moth



Rosy Maple Moth



Gypsy Moth



Southern Flannel
Moth



Cecropia Moth



Atlas Moth



Polyphemus
Moth



Venezuelan
Poodle Moth



Garden Tiger
Moth



Indianmeal
Moth



Isabella Tiger
Moth



Peppered Moth



Luna Moth



White Moth



Imperial Moth



Giant Leopard
Moth



American Dagger
Moth



Black Witch
Moth



White-lined
Sphinx Moth



Io Moth



Miller Moth



Codling Moth

Endopterygota (Order: Lepidoptera)

Distribution:

Common worldwide. Third largest order of insects, with approximately 75 families and 11,286 species in North America and 135 families and >112,000 species worldwide.

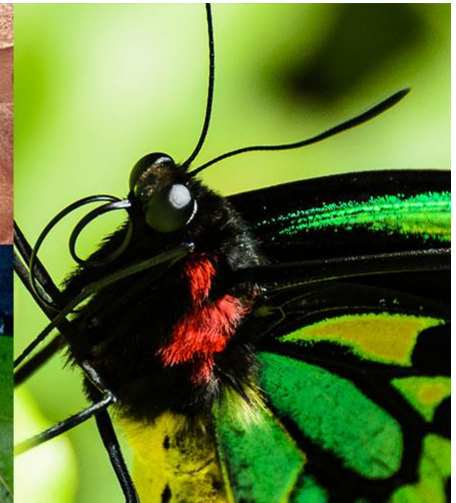
Economic importance

Although many Lepidoptera are valued for their beauty, and a few are useful in commerce (e.g., the silkworm, *Bombyx mori*), the larvae of these insects are probably more destructive to agricultural crops and forest trees than any other group of insects.

Endopterygota (Order: Lepidoptera)

Differences between butterflies and moths

- Butterflies usually rest with their wings closed, while moths rest with their wings open.
- Butterflies are active during the day (diurnal), whereas moths are active at night (nocturnal).
- Butterflies have long, thin antenna, while most moths have shorter feathery antennas.



Endopterygota (Order: Lepidoptera)

- Most moths make a silky cocoon, while butterflies usually make a shiny chrysalis.
- In general, moths tend to be duller and less vibrant in colour, with less intricate and striking patterns.

Although this is a generalised rule, some moths, such as the Madagascan Sunset Moth are incredibly colourful and striking.



Left: a Hercules Moth Cocoon.
Right: a Birdwing Butterfly Pupa



Home work

- Which animal is this (the next image) ?
- Which is the largest moth, and what its size?



Dr. Sanaa

Usfel websites

<https://australianbutterflies.com/8-differences-between-butterflies-and-moths/>

<https://genent.cals.ncsu.edu/insect-identification/order-lepidoptera/>

<https://sciencebob.com/what-is-the-difference-between-a-moth-and-a-butterfly/>

Thanks for listening



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