

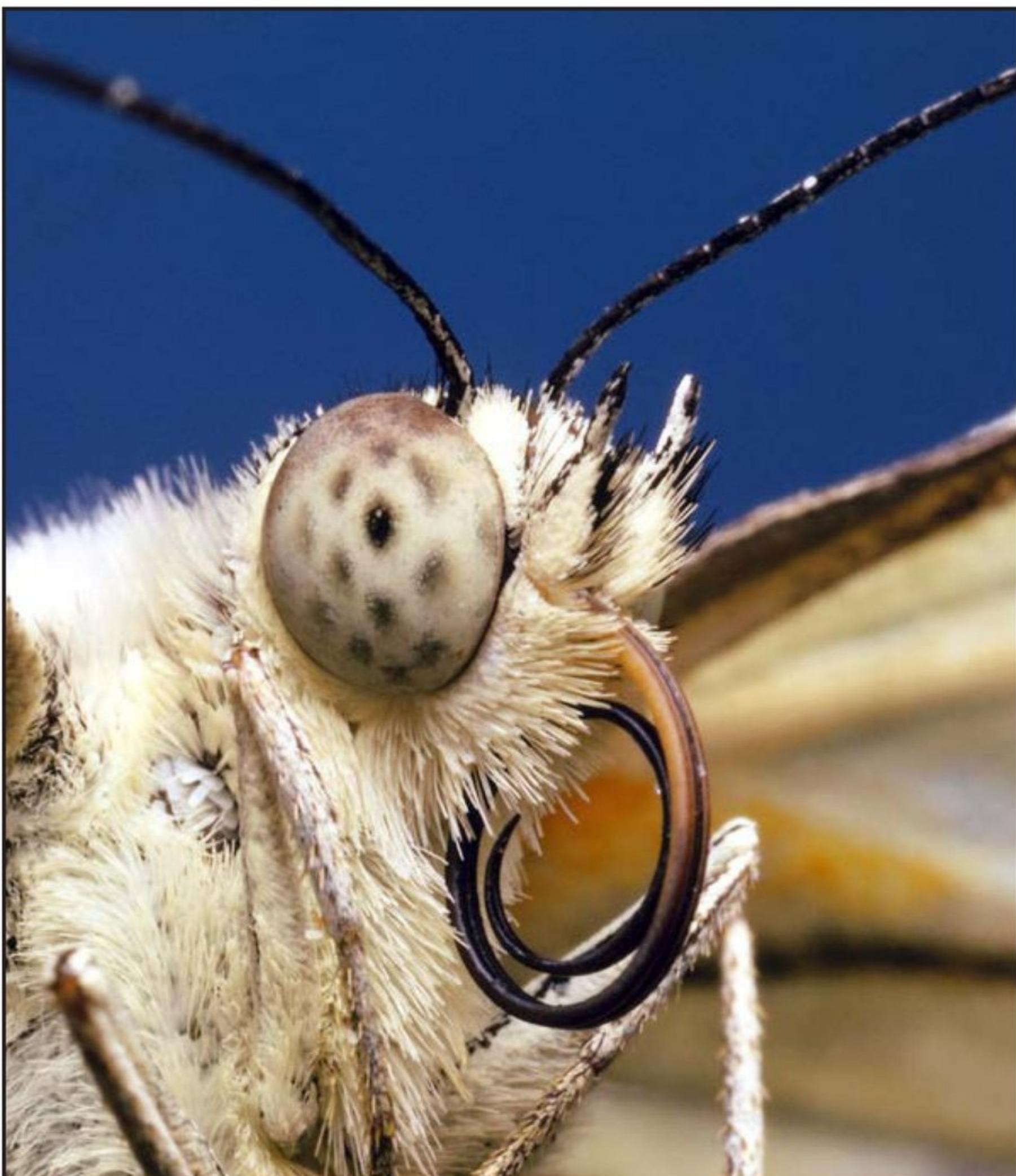
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# Butterflies and Moths

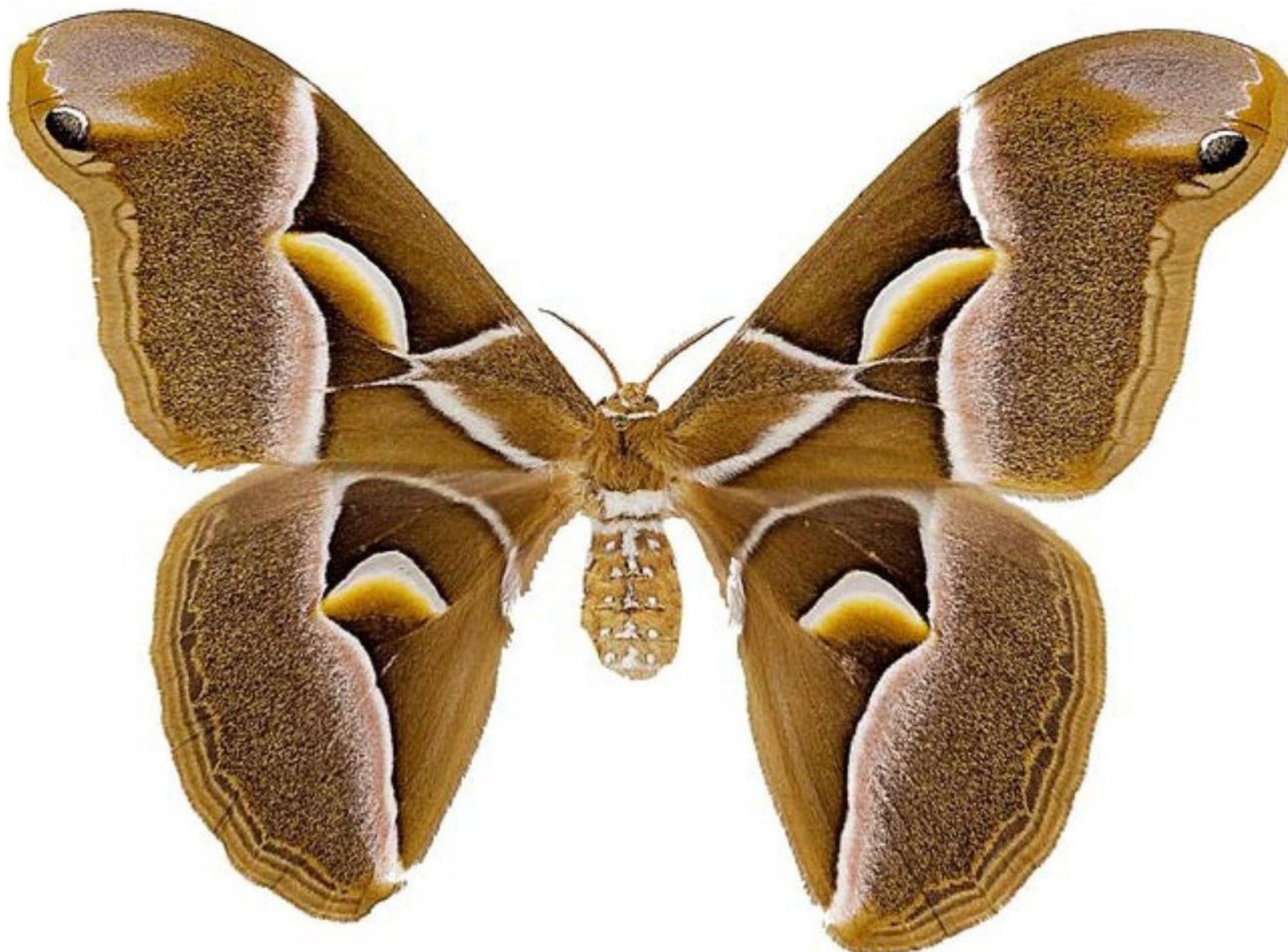


Written by Kira Freed

# *Butterflies and Moths*



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# Introduction

Butterflies and moths can be beautiful to watch. People plant gardens to attract butterflies. Butterflies at zoos and city gardens draw large crowds. However, no one builds a garden to attract moths. Many people think of moths as pests.

So, how are butterflies and moths the same, and how are they different? What makes a butterfly a butterfly? What makes a moth a moth? To answer these questions,

we need to learn about their body parts, life cycle, and behavior.



## Do You Know?

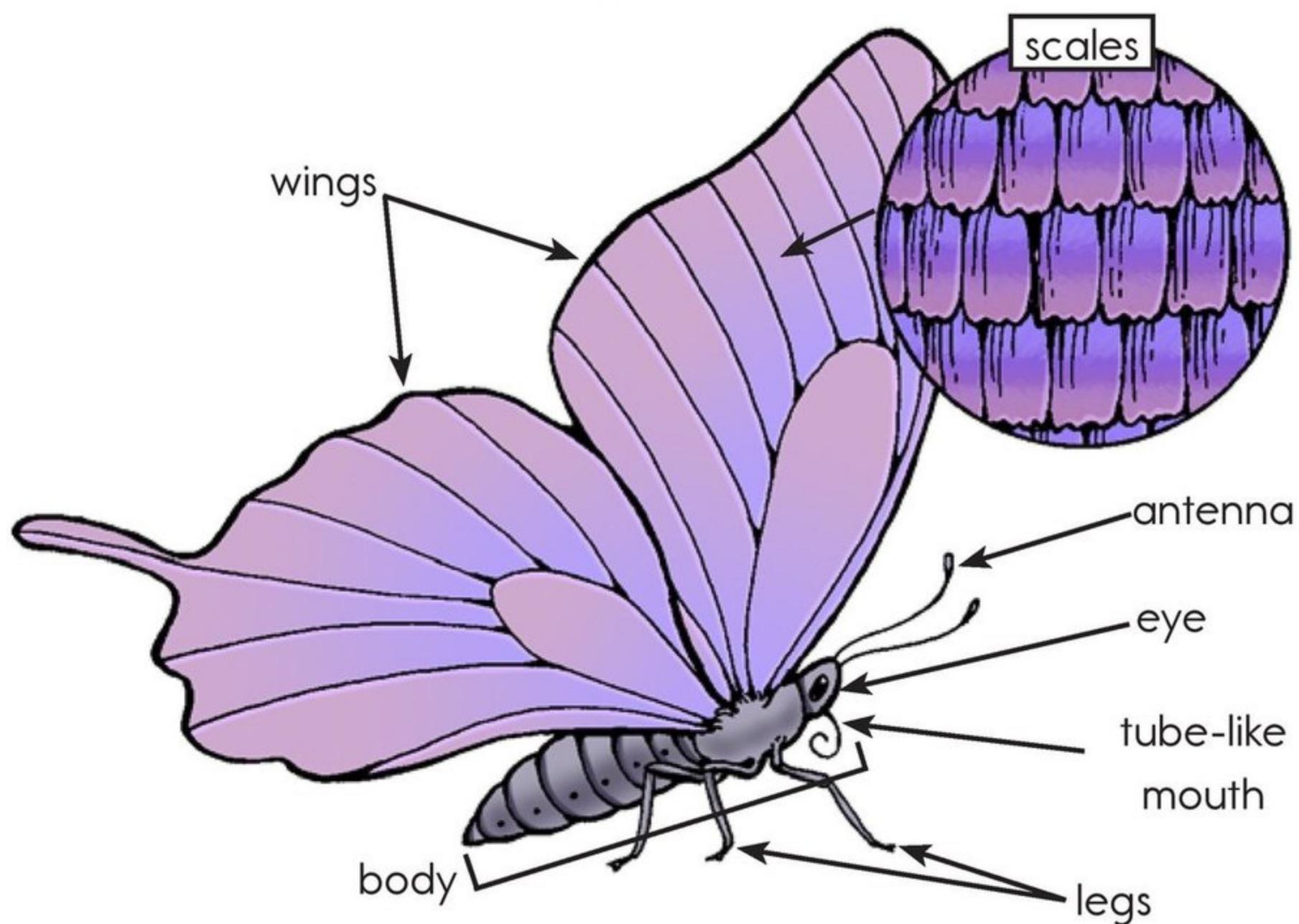
The largest butterfly in the world is the Queen Alexandra's birdwing. From wingtip to wingtip it can be as wide as 30 cm (12 in). It is found in Papua New Guinea.

# What Are Butterflies and Moths?

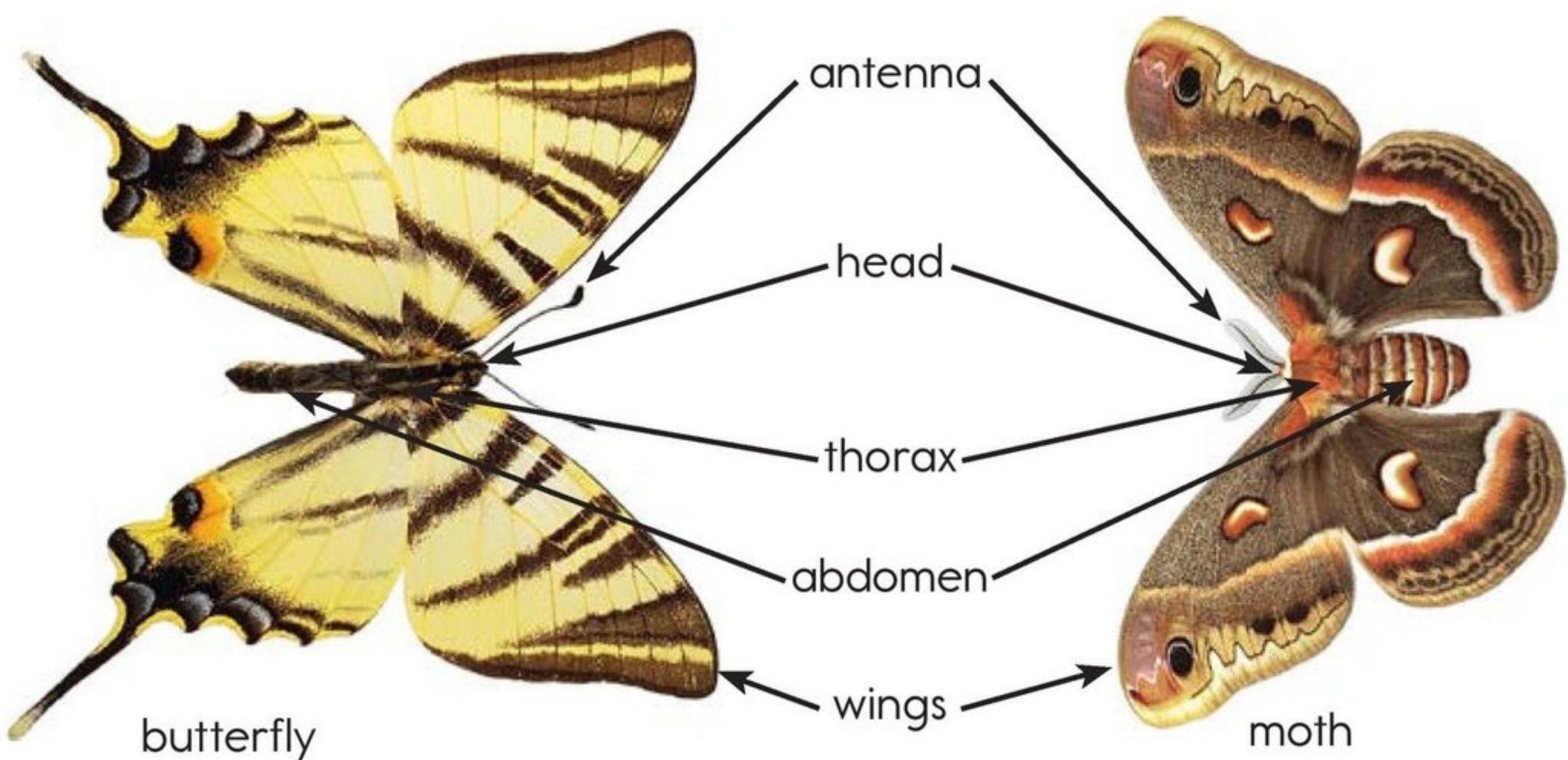
Butterflies and moths are **insects**. Like all insect **species**, they are **invertebrates**, which means they have no backbone. Instead, they have a hard skin, called an **exoskeleton**, that protects their soft insides. They also have six legs, a body divided into three parts, two **antennae**, and two compound eyes.



Their wings are covered with **scales**, which are like fine, flat hairs. These scales protect the wings from getting too wet and help them hold in heat. Butterflies cannot fly if they are too cold. They often sit in the sun to warm up before flying.



Butterflies and moths have many of the same body parts, so it is easy to see why people have trouble telling them apart.



<b>Head</b>	<ul style="list-style-type: none"><li>• Compound eyes made up of many smaller eyes allowing them to see all around them</li><li>• Antennae to smell and to sense movement</li><li>• Mouth is a long tube for sucking nectar</li></ul>
<b>Thorax</b>	<ul style="list-style-type: none"><li>• Two pairs of wings</li><li>• Three pairs of legs</li><li>• Breathing holes</li></ul>
<b>Abdomen</b>	<ul style="list-style-type: none"><li>• Digestive organs</li><li>• Reproductive organs</li><li>• Breathing holes</li></ul>

### Do You Know?

More than 165,000 kinds, or species, of butterflies and moths exist. Most of these are moths. It is believed that another 100,000 species exist that have not been studied or identified.

However, butterflies and moths are also different from each other in many ways. The next time you find a butterfly or moth, use this chart to help you tell which kind of insect you have found.



Butterflies	Moths
Most are active during the day.	Most are active at night.
Most are brightly colored.	Most are dull in color.
Skinny body without “fur”	“Fat, furry” body
Most have antennae with knobs.	Plain or feathery antennae
Most rest with their wings above their body.	Most rest with their wings spread out flat at the sides of their body.
Enlarged lobe on each hind wing that provides overlap	Tiny hook or bristle that links each forewing and hindwing while in flight

## Life Cycle

After a pair of male and female butterflies or moths mate, the female lays her eggs. She lays them on or near leaves, twigs, or flowers so that her young will have something to eat when they hatch.



Lobster moth egg



White butterfly eggs



A swallowtail caterpillar crawls out of its egg.

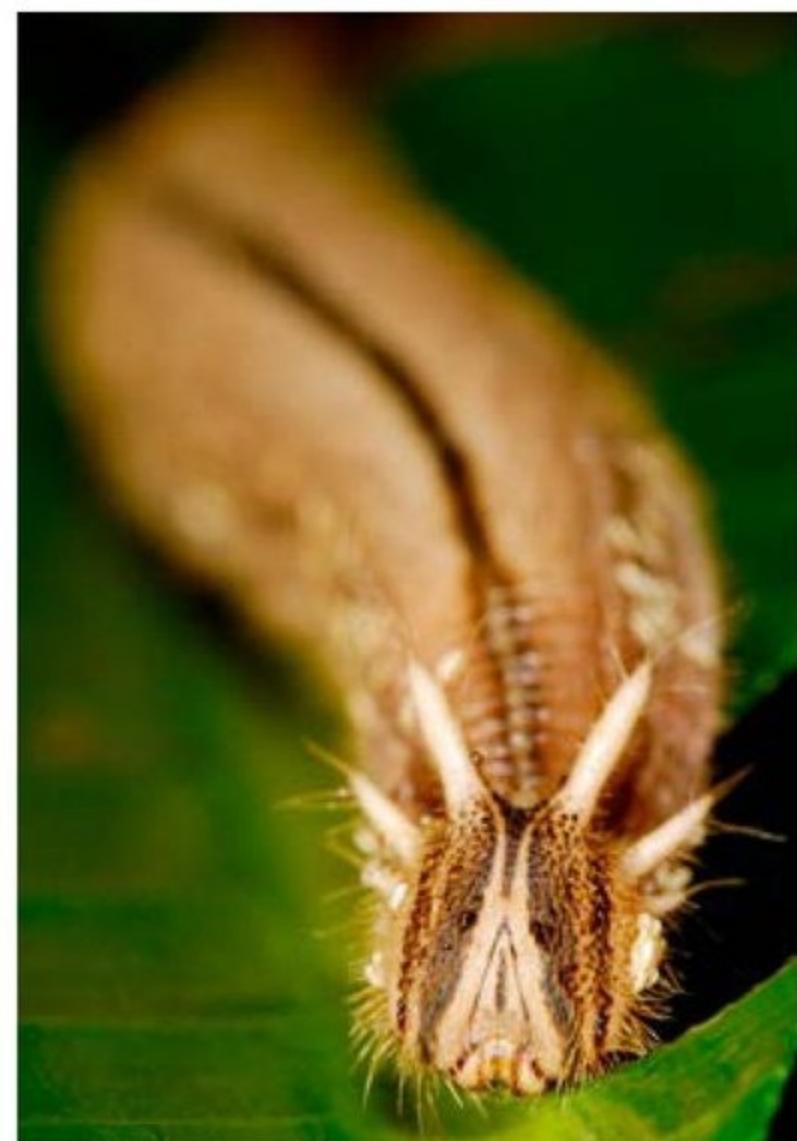
When eggs hatch, **caterpillars** come out. This begins the **larval** stage of the butterfly and moth life cycle. Caterpillars have chewing mouth parts and can eat 27,000 times their body weight during their lifetime. Their egg case is often their first meal, followed by the leaf or flower they're on, and then the rest of the plant.

A caterpillar's job is to eat and grow. As it grows, its skin becomes tight and breaks away. A new skin grows in its place to allow the caterpillar to get bigger. This is called **molting**. A caterpillar molts four or five times during its life. The caterpillar is fully grown after about two weeks.

The life of caterpillars is filled with danger. They are food for many larger animals, such as lizards, birds, bats, and small mammals. Caterpillars have many interesting ways to protect themselves from being eaten.

Some caterpillars have spines and other hairs that make them taste bad to predators. Others have colors or patterns on their bodies that make them appear more dangerous than they are. Caterpillars also can be masters at hiding, blending in with their background, or staying still until night comes, or until the danger goes away.

The swallowtail butterfly caterpillar has red horns that release a strong odor to keep away predators. Many caterpillars feed on plants that make them taste bad to birds and other enemies. These caterpillars often are brightly colored to warn others: *Do not eat me!*



Owl butterfly caterpillar



## Do You Know?

The pupa cannot move to escape predators. Many butterfly chrysalises are well hidden by looking like a dead leaf or piece of bark. Some chrysalises are poisonous and are brightly colored to tell predators that they are not good to eat.

This Puss moth cocoon blends in with tree bark to keep predators from seeing it.

When a caterpillar is fully grown, it enters the **pupal** stage. In this stage, a caterpillar slowly changes into an adult. It appears dead from the outside, but amazing changes are happening inside.

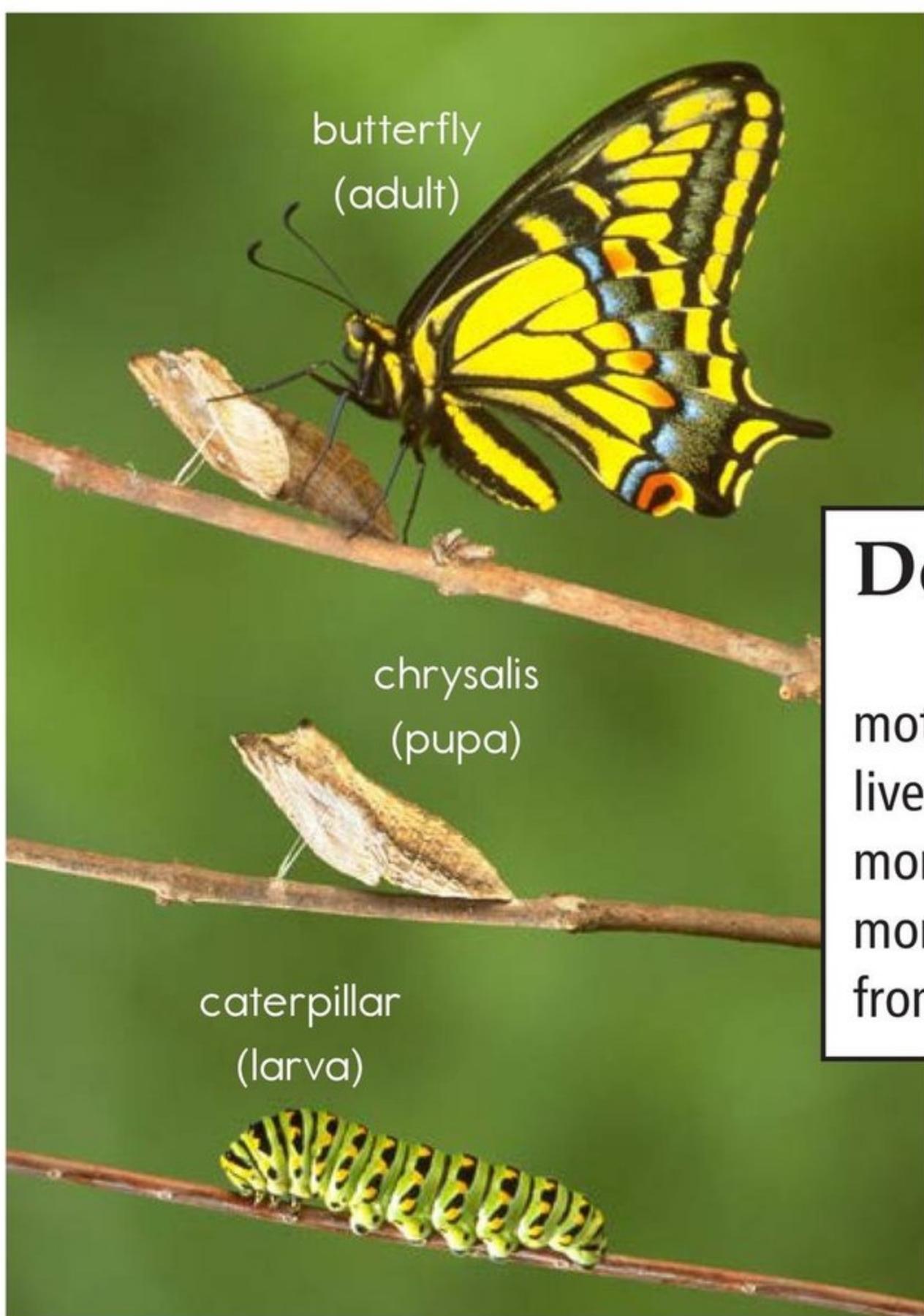


The caterpillars of most butterflies enter this stage by sticking their back end onto a twig, leaf, or other object. The last molt leaves a soft pupal skin that hardens into a case called a **chrysalis**. The caterpillars of many moths go through the pupal stage underground or on the ground. Others spin a **cocoon** to protect themselves.

Just a few hours after the pupal stage begins, different mouth parts, legs, new muscles, and tiny wings begin to form. The change from pupa to adult can take a few weeks. The entire change from egg to larva to pupa, and then to adult, is called **metamorphosis**.

When the adult is fully formed, it breaks out of the case. Its wings, which are damp and crumpled, must expand, dry, and harden before the insect can fly. When the butterfly or moth

comes out of its chrysalis, it is adult in size and will not grow any more.



## Do You Know?

For most butterflies and moths, life is short! Adults live for two weeks to two months, except for the monarch, which can live from nine to twelve months.

This photo shows three stages of metamorphosis.



## Do You Know?

Lantana and butterfly bush are great plants for attracting beautiful butterflies to your garden. If you want to attract moths at night, try smearing mashed banana and honey on a tree trunk. Keep watch with a flashlight.

A monarch feeds on butterfly bush.

## Life as an Adult

Adult butterflies and moths come in many shapes, sizes, and colors. Many butterflies are brightly colored, but others are white or light colored. While many moths have dull colors, some, such as the luna moth, have amazing colors or patterns.

Adult butterflies and moths have many enemies. They need to be as careful as caterpillars not to get eaten. Even though adult butterflies and moths can fly, many animals that hunt them—such as birds and bats—can fly, too.

Adult butterflies and moths, like caterpillars, have many ways to hide to stay safe from predators. Some have patterns on their wings that help them to blend in with nature. Many patterns look exactly like leaves or flowers. Other butterflies and moths have bright patterns on their wings, such as spots that look like eyes, to scare away enemies. Some, such as the monarch butterfly, are brightly colored to warn predators that they taste bad.

## SPOTLIGHT ON: Buckeye Butterfly

*Wingspan:* 4.2 to 7 cm  
(1.7– 2.8 in)

*Range:* North America,  
from southern Canada  
to southern Mexico

*Appearance:* The wings of the buckeye butterfly have large eyespots of black, blue, and yellow. The eyespots look like the eyes of a large animal. A predator may be scared when the buckeye shakes its wings and flashes its eyespots. This may give the butterfly an extra second or two to fly away before being eaten.



## SPOTLIGHT ON: Luna Moth

*Wingspan: 7.5 to 11.3 cm (3– 4.4 in)*

*Range: Eastern and plains areas of United States and Canada*

*Appearance:* The luna moth has beautiful pastel green wings with reddish-brown edges. The unusual shape of its hind wings helps it to hide among leaves when it is resting. This is one of a few moths that never eat as an adult. It eats enough to last a lifetime while it is a caterpillar. It spends its adult life seeking a mate and laying eggs.



Most adult butterflies and moths feed on nectar, a sweet liquid from flowers. They suck up nectar using their mouth parts, which look like a hollow tube and work like

a straw that curls up when not in use.

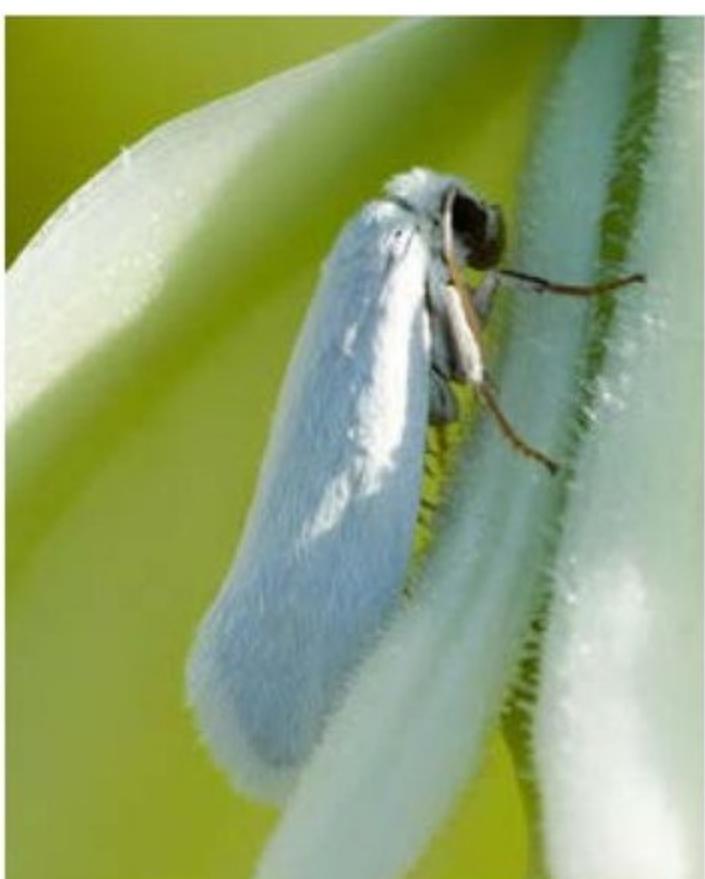
Butterflies and moths do not have jaws or teeth, and they do not eat solid food.



Butterflies have a good sense of sight, but a poor sense of smell. The flowers they eat from are brightly colored. Flowers often grow in groups that provide butterflies with a place to land. Butterflies often walk around flower groups, sucking nectar from each blossom with their mouth parts.



- ▲ Flowers pollinated by butterflies and moths often have very different shapes.



Because most moths are active at night, most of the flowers they eat from are light colored to be seen in moonlight. These flowers often give off a sweet smell to attract them. Because moths often hover rather than land, the flowers' petals are shaped to allow for easy eating.

Butterflies and moths have sense organs in their antennae, mouth parts, legs, feet, and other parts of their bodies. These sense organs help them find food, mates, and plants on which to lay eggs.



(Left) Monarchs resting



(Right) Monarch migration routes

Some butterflies and moths that live in cold places **migrate** to warmer places before winter begins. The best known butterfly that migrates is the monarch butterfly. Monarchs in North America begin their long journey south when it begins to cool off in late summer or fall. Monarchs living west of the Rocky Mountains fly to several places on the California coast. Monarchs living east of the Rockies fly as far as 4,800 kilometers (2,982 mi) to Mexico. When they reach warmer places, millions of them rest in trees through the winter. In spring, they migrate north again in search of plants on which to lay their eggs. No one knows how monarchs find their way.

## Conclusion



Over the years, people have collected butterflies and moths for scientific study and as a hobby. Scientists and others have learned a great deal about these insects from collections. However, millions of these beautiful insects have lost their lives because of collectors.

Watching butterflies and moths while they are alive is much kinder and also more interesting. You can learn a great deal about their similarities and differences just by watching them fly and feed. Take pictures of them or catch them in a net for a closer look (don't touch!) and then let them go. View photos of your favorite species on the Internet or in a book. Build or visit a butterfly garden and keep a journal to record their activities.

### Do You Know?

Do not touch butterflies or moths. The oils on human hands can hurt their wings. No matter how gentle you try to be, you are likely to hurt them by breaking a piece of wing or rubbing off some scales.

However you choose to enjoy butterflies and moths, remember that they are among nature's most amazing insects.

## Glossary

<b>antennae</b>	the feelers on an insect's head that help it feel and smell (p. 5)
<b>caterpillars</b>	the larvae of butterflies and moths (p. 9)
<b>chrysalis</b>	the stiff case around the pupa of a butterfly (p. 11)
<b>cocoon</b>	the case around the pupa of some moths, usually made of silk (p. 11)
<b>exoskeleton</b>	the hard, outer shell of insects and their relatives (p. 5)
<b>insects</b>	small animals that have six jointed legs and a body with three parts; many have wings, too (p. 5)
	
<b>invertebrates</b>	animals that do not have a backbone (p. 5)
<b>larval</b>	a stage in an insect's life cycle just after hatching from its egg (p. 9)
<b>metamorphosis</b>	the process of changing from one form into another (p. 12)
<b>migrate</b>	to move from one place to another, such as from a cold place to a warm place (p. 17)

<b>molting</b>	the process of an animal shedding its whole skin (p. 9)
<b>predators</b>	animals that hunt and eat other animals (p. 10)
<b>pupal</b>	a stage in an insect's life cycle when it is changing from a caterpillar into an adult (p. 11)
<b>species</b>	a group of animals that share many traits (p. 5)

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