



# Why study butterflies?

A large, international community of biologists specialize on studying butterflies. These insects are used to investigate a huge range of questions from ecosystem dynamics, to the genetic and developmental regulation of diversity, or the effects of climate change and habitat destruction on biodiversity. Many butterflies are extremely beautiful and easily capture the attention of the public, but why are they subject to such intensive research?

## 1. Evolution and Diversity

For biologists interested in the evolution and maintenance of diversity

Lepidoptera provide a huge range of material!

DIVERSITY

200,000

species described  
(butterflies and moths)

ACTIVITY



day (most butterflies) and  
night (most moths)

ENVIRONMENTS



tropical forests to savannahs,  
coasts to mountains

LIFESPAN



Less than a week to many  
months

BEHAVIOR



May be socially complex,  
including attracting mates  
through smell, visual displays  
or tactile manipulation

DIET



fruit, feces, leaves,  
reptile tears,  
decomposing animals,  
blood and others

## 2. History

Because they are so abundant, diverse, and easily observed in the wild,

Lepidoptera have played a historically important role in modern biology.

Indeed, some of the first examples of Darwinian evolution were based on

studies of tropical butterflies by Victorian Naturalists in the 19th century.



This historical importance means we have hundreds of years of

information about the biology and distribution of many species. These

data form the foundation of many on-going studies and provide important

comparisons with modern population data.

## 3. Tractability

Several butterflies have become well studied due to the ease with which they can be bred in captivity and studied

in the wild. For example, *Heliconius* research includes field studies of their behavior and ecology, as well as

insectary-based experiments and, more recently, sequencing and analysis of their genomes. This has allowed biologists to study how populations diverge through time, and to understand how changes in gene regulation produce their diverse colour patterns.



wildtype

mutant

Researchers blocked a gene involved in color production in *Heliconius pacheus* to learn to learn what its role in the formation of wing patterning is.



*Anartia jathropae* is one of the most common butterflies in disturbed areas in Central America, it feeds from grasses such as *Blechnum*.

## 4. Ecosystem Importance

Lepidoptera are important 'indicator species'. They can give

biologists clues about how healthy an ecosystem is. This is because many butterflies have specific needs, for example

they may be specialized on one type of hostplant, or a

particular micro-habitat. Lepidoptera are also important

pollinators of some plants, and important prey for many

birds, bats and other insectivorous animals. An ecosystem

that supports a diverse community of butterflies is therefore

a healthy one, as butterfly diversity can reflect the

abundance of different plants and animals.

## 5. Butterfly Conservation

Human activity is changing our climate and

environment through pollution and habitat

destruction. We have a responsibility, and need,

to protect natural ecosystems and the wildlife that depends on them. Doing so is a huge challenge.

One way to tackle the problem is to focus on key

indicator species. By protecting and managing

the environment in a way that supports diverse

butterfly communities, we will preserve habitats

that are rich and abundant in many other species.



Every year researchers survey monarch butterflies in Mexico to assess the effects of climate change and predict the future of insect populations.