







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)

day (most butterflies) and night (most moths)

LIFESPAN

ACTIVITY

ENVIRONMENTS

Less than a week to many

tropical forests to savannahs, coasts to mountains

BEHAVIOR

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



months

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

2. History

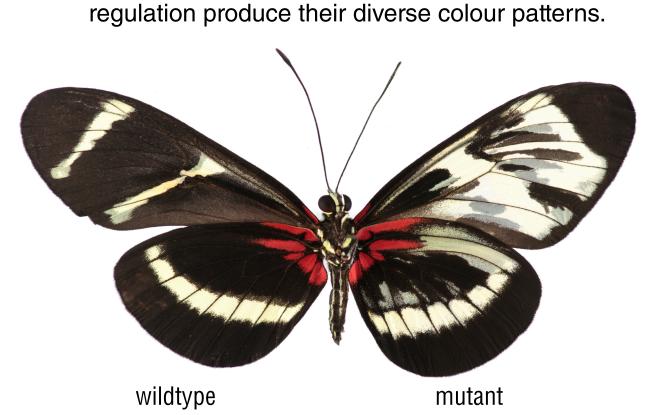
Because they are so abundant, diverse, and easily observed in the wild, Lepidoptera have played a historically important role in modern biology. Indeed, some of the first examples of Darwinian evolution were based on studies of tropical butterflies by Victorian Naturalists in the 19th century.



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



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



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

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



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