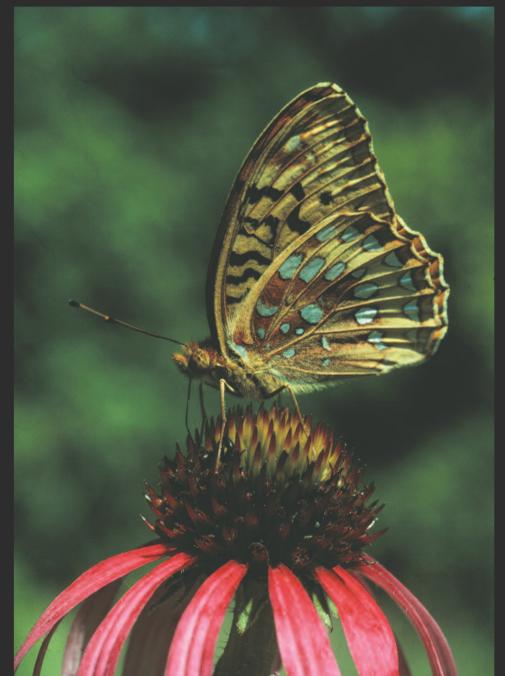


Illinois Moths & Butterflies



Approximately 2,000 species of butterflies and moths, members of the insect Order *Lepidoptera*, are found in Illinois. Of this number, 150 species are butterflies and 1,850 species are moths. The Lepidoptera (from the Latin *lepto* for scale and *ptera* for wing) represent one of the largest groups of insects. It is a very important group economically because of its association with plants. In their *caterpillar* stage butterflies and moths eat plant parts and in their adult stage pollinate flowers. These insects are food resources for many birds, mammals, and other *arthropods*. Numerous species serve as indirect indicators of habitat quality. For example, if the plant species upon which they depend are becoming scarce, these insects may also become fewer in number.

Key Moths and butterflies are not shown in equal proportion to actual size. Photographs by Michael R. Jeffords (1 – 23) and Susan L. Post (24 & 25).

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25			

1. American snout, *Libytheana bacchantis* (Kirtland)
 2. tiger swallowtail, *Pierus glaucus* (Linnaeus)
 3. io moth, *Acontia io* (Linnaeus)
 4. little wood satyr, *Mezitis cymela* (Cramer)
 5. coral hairstreak, *Harpencampus stiva* (Fabricius)
 6. question mark, *Polyommatus interrogationis* (Fabricius)
 7. spicetwist swallowtail, *Pieris troilus* (Linnaeus)
 8. hummingbird clearwing moth, *Henaris thysbe* (Fabricius)
 9. haploa moth, *Haploa sp.*
 10. monarch, *Danaus plexippus* (Linnaeus)
 11. mourning cloak, *Nymphalis antiopa* (Linnaeus)
 12. polyphemus moth, *Aythya polyphemus* (Cramer)
 13. cecropia moth, *Hyalophora cecropia* (Linnaeus)
 14. yellow-collared scape moth, *Cissops fulvicollis* (Hubner)
 15. viceroy, *Basileachia archippus* (Cramer)
 16. American painted lady, *Vanessa cardui* (Linnaeus)
 17. giant leopard moth, *Epanthoria scribneri* (Stoll)
 18. red-spotted purple, *Basileachia arthemus* (Drury)
 19. black swallowtail, *Papilio polyxenes* Fabricius
 20. gray hairstreak, *Strymon melanos* Hubner
 21. buckeye, *Junonia coenia* Hubner
 22. ailanthus webworm moth, *Antena punctella* (Cramer)
 23. pipevine swallowtail, *Battus philenor* (Linnaeus)
 24. luna moth, *Actias luna* (Linnaeus)
 25. great spangled fritillary, *Speyeria cybele* (Fabricius)

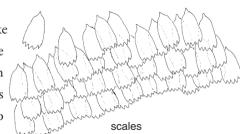
Moth Butterfly [Glossary term](#)

This poster was made possible by:
Illinois Department of Natural Resources
 Division of Education
 Illinois State Museum
 Illinois Department of Transportation
 Text: Everett D. Cashatt, Illinois State Museum
 Michael R. Jeffords, Illinois Natural History Survey

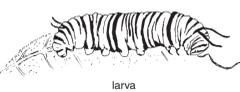
Anatomy

Lepidoptera, like other insects, have three main body parts (head, thorax, abdomen), three pairs of legs, and a pair of antennae. Most have two pairs of wings, which are covered with tiny scales. The scales and their arrangement provide the diversity of color patterns seen in different species. A few species are wingless. In Illinois, females of the bagworm moth (*Thyridopteryx ephemeraeformis*) and females of the white-marked gypsy moth (*Orgyia leucostigma*) are wingless.

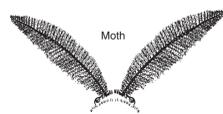
The mouthparts of adults are modified into a tube-like **proboscis** for taking in liquids, like nectar or sap. The proboscis is coiled at the front of the head when not in use. Some species, such as the common Illinois moths cecropia (*Hyalophora cecropia*) and luna (*Actias luna*), do not feed as adults.



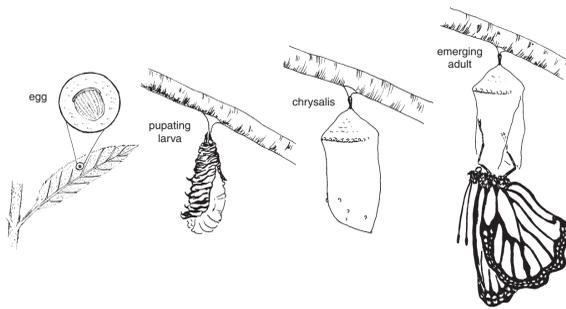
The cylindrical larva, or **caterpillar**, is soft-bodied. It has a hardened head with chewing mouthparts (mandibles), well-developed **maxillary palpi** for food handling, and **spinnerets** for releasing silk. The thorax has one pair of legs on each of its three segments. One pair of **spiracles** (for breathing) is present on the thorax, and spiracles are found on each of the ten abdominal segments. **Prolegs** are also present on abdominal segments three through ten. Prolegs often have small hooks, called crochets, which the caterpillar uses to cling to vegetation. Spines, bumps, or hairlike structures may be present on the body. Coloration ranges from protective camouflage to bright warning. The larvae of some species, such as swallowtails, can produce a disagreeable odor.



Butterflies have threadlike, knob-tipped antennae. Moths have antennae in many shapes (but never with knobs).



Life History



Butterflies and moths undergo a complete metamorphosis, which has four distinct stages: egg, larva, pupa (**chrysalis**), and adult (butterfly or moth). Depending on the species, eggs may be laid singly or in clusters on or near the host plant. Eggs hatch into the larval, or **caterpillar**, stage. Larvae of some species feed on many different kinds of plants; others tend to feed on only one particular species. The larva may **molt** several times before it **pupates**. Although the pupa appears to be inactive, its internal tissues are restructuring to form the adult. Many species of moths and a few species of butterflies pupate within cocoons spun from their silk glands. Others may pupate in a sheltered area, like leaf litter, or in the soil. Most butterflies pupate on or near their host plant. Upon completion of this stage, the pupal skin splits apart, and the soft, newly formed adult pulls itself out through the narrow opening. Most adults live only about two weeks, during which they mate and lay eggs. However, some species overwinter in the egg, larval, or pupal stage, and adult monarchs (*Danaus plexippus*) migrate to Mexico in the fall. When butterflies and moths are ready to mate, the males and females of each species find each other by means of odors secreted by the **pheromone glands** or by looking for others with a specific pattern of markings on the body.

Butterfly & Moth Gardens

Observing butterflies and moths can be a very rewarding activity. While you can seek them out in the wild, you can also bring them to your home or schoolyard with a butterfly and moth garden. All you need to be a butterfly gardener is a sunny space, good soil, a little hard work, and an assortment of nectar-producing flowering plants. A complete butterfly and moth garden contains food plants for the adults and their larvae. While the adults will feed on an assortment of flowers, the young are more choosy about where they dine. When planning your garden, try to find out which butterflies and moths are native to your area and learn about their food preferences, including those of their **caterpillars**.

Plant the garden in a sunny area. Butterflies need sunlight to warm their flight muscles, and when not feeding, they relax in the sun. A few flat stones or boards placed in and around your garden will provide resting sites. Mud puddles, too, are important moisture sources. You can create a mud puddle by sinking a container without drainage holes in the ground, filling it with a sand and soil mixture, and adding water. Or, when making the garden, leave the natural depressions unfilled, allowing the rain to create the puddles.

Attracting moths for observation is more difficult. Aside from favorite host plants, outdoor lighting or bait (like fermenting fruit juices) also draws many species of moths. Another way to attract moths is by planting night-flowering plants, such as hard-shelled gourds.

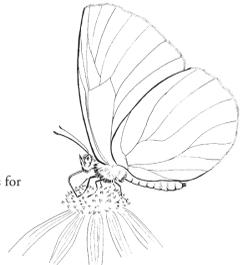
Good Choices for Your Garden

These plants are commonly used by various adult butterflies as nectar sources:

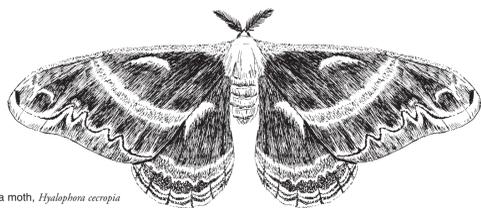
- black-eyed Susan
- blazing star
- boneset
- butterfly weed
- clover
- coneflowers
- dogbane
- goat's beard
- goldenrods
- ironweed
- Joe-Pye weed
- milkweeds
- New England aster
- phlox
- spearmint
- thistles
- verbena
- wild bergamot

These plants are commonly used as both nectar sources for adults and food sources for larvae:

- goldenrods
- milkweeds
- spicebush
- thistles



Conservation



cecropia moth, *Hyalophora cecropia*

Surveys indicate that the populations of some species of **Lepidoptera** have declined in Illinois, especially those associated with prairies and wetlands. It is generally accepted that the primary cause for the reduction is loss of habitat from urbanization, industrialization, and the widespread use of pesticides. To conserve our remaining butterflies and moths, we need to continue to manage our public and private natural areas in ways that protect and maintain Lepidoptera populations. Research to determine what species remain and to better define their habitat requirements should continue to be conducted and, based on our best information, recommendations made for management policies to be adopted by land managers.

There are many ways we can expand our knowledge of Lepidoptera and support the conservation of these insects. Amateur lepidopterists make significant contributions to this science by studying and properly documenting life cycles and host plants of many species. While collections of natural history specimens, such as butterflies, are a necessity for scientists and the focus of many passionate hobbyists, there are other ways to enjoy these wonderful creatures.

- Learn to identify the common Lepidoptera in the field without catching or handling them. Many field guides are available to help you with identification.
- Keep a journal of your butterfly and moth observations including items such as the weather, the habitat type, the insect's behavior, time, and date.
- Photograph butterflies and moths.

Those who are interested in joining other butterfly enthusiasts can participate in butterfly monitoring programs. For more information, contact the North American Butterfly Association, 4 Delaware Road, Morristown, New Jersey 07960 (web site: <http://www.naba.org>).

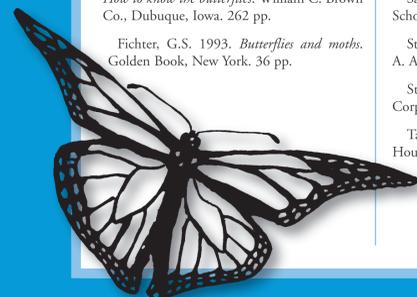
Lepidoptera Facts

- Butterflies are usually active by day and have threadlike, knob-tipped antennae, a small body, and broad wings. Moths generally are active at night, have antennae in many shapes (but never with knobs), a stout body, and narrow wings.
- The monarch butterfly (*Danaus plexippus*) is the official State Insect of Illinois.
- The largest moth in Illinois, the cecropia (*Hyalophora cecropia*), is also the largest moth in North America. It has a wingspread of five to six inches.
- Female moths release chemicals into the air to attract males. In some species, the male can find the female from one to three miles away.
- Several species of Lycaenidae butterflies have **caterpillars** that are tended by ants. The ants protect the larvae from predators in exchange for food in the form of sweet excretions they take from the larvae.
- Clearwing moths of the family Sesiidae fly about in the daytime, unlike most other moths. They are mimics of wasps, which serves to protect them from predators.
- The spicebush swallowtail (*Pterourus troilus*) starts life as a caterpillar that mimics a bird dropping. As it grows bigger, the caterpillar then mimics a rough green snake. As a **chrysalis**, it mimics a dead leaf. As an adult, it mimics another swallowtail, the pipevine (*Battus philenor*), that is distasteful to predators.
- The dog face sulphur butterfly (*Colias cesonia*) has an image that resembles a French poodle on each wing.
- Moths first appeared during the age of the dinosaurs, about 200 million years ago. Butterflies developed about 40 million years ago.
- In the fall, monarch butterflies (*Danaus plexippus*) migrate approximately 80 miles per day to overwinter in the mountains of central Mexico. When they begin their flight back in the spring, they lay eggs along the way.
- Some pyralid moths are aquatic: their eggs are deposited under water, and their larvae develop external gills. One species, *Petrophila bifasciata*, lives in a silken web in fast-flowing streams where it feeds on diatoms and algae that it scrapes from rocks.
- The red-humped caterpillar (*Schizura concinna*) defends itself by spraying an acid up to eight inches from an opening underneath the prothorax.
- Some moths (including some inchworms and snout moths) have ears on the first abdominal segment that they use to detect the high-pitched calls of bats and thus aid their escape from these predators. Other moths have hearing organs on the thorax (including some owl moths, tiger moths, lichen moths, and wasp moths).

Illinois Moths & Butterflies

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Glossary

- arthropod** invertebrate, such as an insect, crustacean, arachnid, or myriapod, with a segmented external covering and jointed limbs
- caterpillar** the larval form of a butterfly or moth
- chrysalis** pupa without a cocoon
- cocoon** a covering of silk or other material spun by the larva as a protection for the pupal stage
- entomology** the study of insects
- Lepidoptera** the order of insects that contains the butterflies and moths; from *lepido* for scale and *ptera* for wing
- maxillary palpi** mouthparts that aid in food handling
- molt** to shed the skin
- pheromone gland** structure that produces chemicals which, when released, influence the behavior of other members of the same species
- proboscis** long, coiled, hollow feeding tube
- proleg** fleshy leg without joints on the abdominal segments of a caterpillar
- pupate** process of leaving the larval stage and entering the pupa stage
- spinneret** opening of the silk gland from which silk is spun
- spiracle** opening through which insects breathe

Agency Resources

More information is available regarding Illinois' butterflies and moths. Scientists at the Illinois Natural History Survey's Center for Economic **Entomology** study butterfly and moth distributions, populations, life histories, and economic impacts and maintain a research collection. They also provide educational materials and programs about insects to students and teachers. Entomologists from the Illinois State Museum conduct studies of butterflies and moths and curate its research collection. Biologists at the Illinois Department of Natural Resources' (IDNR) Division of Forest Resources study **Lepidoptera** in relation to disease identification and control in forests. The IDNR Division of Education offers educational materials about insects for teachers and sponsors the *Schoolyard Habitat Action Grant* program.

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Illustrations by Carie Nixon (Illinois Natural History Survey, IDNR)

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