

Buck moth *Hemileuca maia* (Drury)¹

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Introduction

The buck moth, *Hemileuca maia* (Drury), is a member of Saturniidae, the giant silkworm family. This primarily tropical family also includes the luna moth, *Actias luna* (Linnaeus); imperial moth, *Eacles imperialis* (Drury); polyphemus moth, *Antheraea polyphemus* (Cramer), regal moth, *Citheronia regalis* (Fabricius); and io moth, *Automeris io* (Fabricius).



Figure 1. Adult buck moth, *Hemileuca maia* (Drury).
Credits: Howell C. Curtis



Figure 2. Adult luna moth, *Actias luna* (Linnaeus). Credits:
Ronald F. Billings, Texas Forest Service, Bugwood.org

All of these species are found within Florida. Moths of this family have a medium to large body size with a wide wingspan. The cecropia moth, *Hyalophora cecropia* (Linnaeus), is the largest North American species of Saturniidae and has a wingspan up to six inches (15 cm). The adults in this family have mouthparts that are either very reduced or absent. They rely on resources that are acquired by the caterpillars (larvae). The caterpillars are robust and can exceed four inches (10 cm) in North America.

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Figure 3. Adult polyphemus moth, *Antheraea polyphemus* (Cramer). Credits: Lacy L. Hyché, Auburn University, Bugwood.org



Figure 4. Adult cecropia moth, *Hyalophora cecropia* (Linnaeus). Credits: Pennsylvania Department of Conservation and Natural Resources - Forestry Archive, Bugwood.org



Figure 5. A caterpillar of the polyphemus moth, *Antheraea polyphemus* (Cramer), showing how large giant silkworm caterpillars can become. Credits: David J. Moorhead, University of Georgia, Bugwood.org

The buck moth is in the subfamily Hemileucinae, the buck and day moths. The individuals within this subfamily are found only in the Western Hemisphere. The majority of the species occur in the Neotropics, the region of the Western Hemisphere that occurs south of the Tropic of Cancer

and includes southern Mexico, Central and South America, and the West Indies (Scoble 1995). Caterpillars in this subfamily have numerous multi-branched spines on their bodies, which are used defensively, delivering a sting when touched (Wagner 2005). The range caterpillar, *Hemileuca olivae* Cockerell, occurs in Mexico and in parts of the U.S. states of Colorado, Kansas, New Mexico, Oklahoma and Texas. This caterpillar is found on grasses and can be problematic for livestock in infested pastures (Opler et al. 2009b). The adult females of a Neotropical genus, *Hylesia*, also possess urticating (stinging) hairs on their abdomen. These hairs are used both as defense for the adult and to defend their eggs (Scoble 1995). The larvae of this genus possess stinging spines as well.

Synonymy

Phalaena Attacus maia Drury 1773

Bombyx proserpina Fabricius 1775

Hemileuca maia ab. lintneri Cockerell in Packard 1914

Distribution

The buck moth is found in the eastern United States from Maine to Florida. However, it has been found as far west as Wisconsin, Kansas, and Texas (Covell 1984).

Description

Adults: The adult buck moths have a wingspan that ranges from five to 7.5 cm (2-3 inches). Both their forewings and hindwings are mainly black with a narrow white band running through the center of the wing. Specimens collected in Florida have a reduction of the white band in the forewing more commonly than in other states (Ferguson 1971). The forewing of the buck moth also contains a black-bordered reniform (kidney-shaped) spot that touches the outer edge of the black patch that is closest to the moth's body. A reniform spot is a type of spot that occurs on the outer part of the forewings of moths (Covell 1984). The hindwings of the buck moth have a black edged discal spot that occurs within the white band. All three segments of the

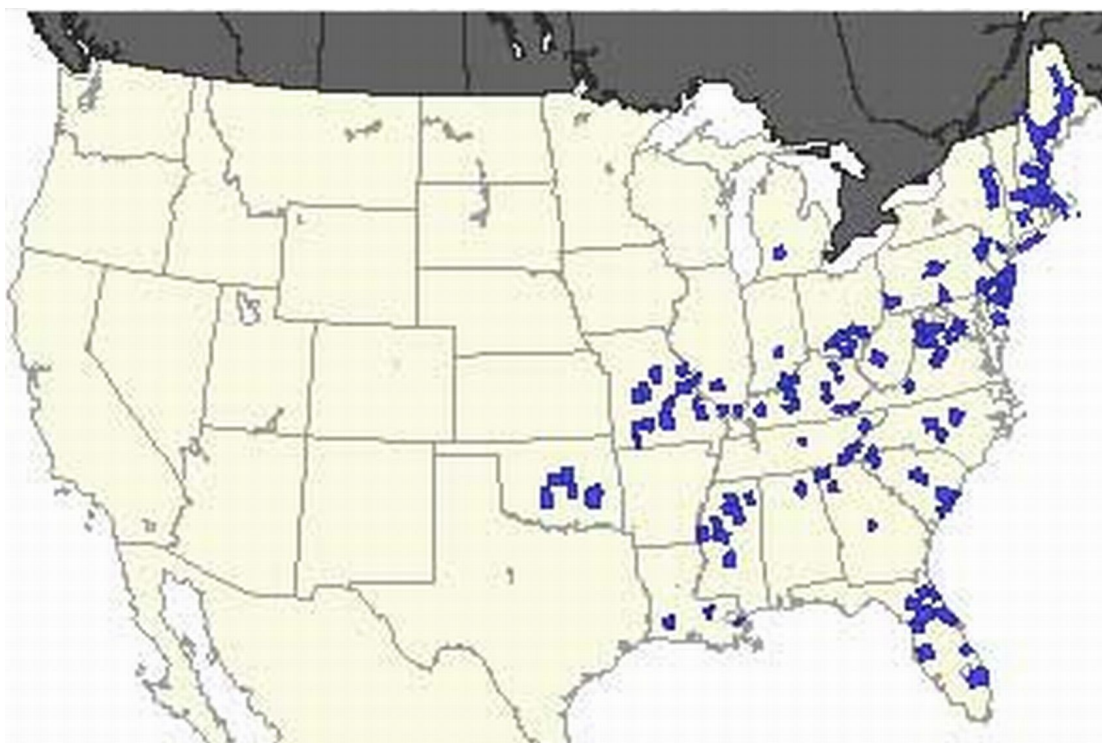


Figure 6. The buck moth is found in the eastern United States from Maine to Florida. However, it has been found as far west as Wisconsin, Kansas, and Texas (Covell 1984). Credits:

female's body (head, thorax, and abdomen) are black. The body of the male is also black except for the tip of the abdomen, which is red. Also, the females generally have larger bodies and wingspans than the males.



Figure 7. Adult male buck moth, *Hemileuca maia* (Drury). Credits: Gerald J. Lenhard, Bugwood.org

Larvae: According to Wagner (2005), the background color of the buck moth larvae is generally black; however, it can be almost white. The thorax (first three segments behind the head) and abdomen (segments behind the thorax) are heavily covered with white spots. The spiracles (openings to the respiratory system) have a pale brown color and

are edged with black. The spines that the larva uses to defend itself are multi-branched and occur in multiple rows on the body. The spines found in the rows on the top of the body are longer and have more branches. The larvae can reach a length of 6.5 cm (2.5 inches) when they are fully grown.



Figure 8. The dark form of the buck moth larva, *Hemileuca maia* (Drury). Credits: Susan Ellis, Bugwood.org



Figure 9. The light form of the buck moth larva, *Hemileuca maia* (Drury). This larva is almost fully-grown. Credits: Lacy L. Hyche, Auburn University, Bugwood.org

Buck moth caterpillars that have a light background color can be confused with both the Nevada buck moth, *Hemileuca nevadensis* Stretch, and the New England buck moth, *Hemileuca lucina* Henry Edwards. The larvae of these three species can best be distinguished based on the preferred host plants (Wagner 2005). The caterpillars of the Nevada buck moth feed principally on willow, while those of the New England buck moth feed on meadowsweet, *Spiraea* spp. In addition, the spines of the buck moth are longer than those of the other two species (Ferguson 2005).

Life Cycle

A single generation of buck moths occurs each year. The adult buck moths have a flight period that occurs between October and November. However, there are records of them flying as early as September in Northern states and as late as December in Florida (Ferguson 1971). The adults are active during the day and are very quick fliers, and can be found flying most commonly between noon and 2:00 pm in oak forests during sunny weather (Covell 1984). After mating, the female oviposits in a ring around a branch of the host plant. The eggs overwinter on the host plant. The larvae hatch in the spring when new plant growth appears (Ferguson 1971).

Like other members of their subfamily, buck moth larvae are gregarious (group together) for their first three larval instars (Wagner 2005). After the third instar, the larvae separate from each other and wander onto other plants where they feed until ready to pupate. The caterpillars pupate in debris that is



Figure 10. The eggs of the buck moth, *Hemileuca maia* (Drury), are laid in a ring around a twig of the host plant. Credits: Gerald J. Lenhard, Bugwood.org

either near to or on the ground, and if they spin a cocoon, it is not very large (Ferguson 1971). Buck moths may not emerge from their pupae for up to two years. Because the adults have no functional mouthparts they do not feed. Their main purpose is to mate and lay eggs.



Figure 11. Larvae of the buck moth, *Hemileuca maia* (Drury), feeding gregariously. Credits: James Castner, University of Florida



Figure 12. The shed, final instar skin (left) of the buck moth, *Hemileuca maia* (Drury), with the pupae (right). Credits: Lacy L. Hyche, Auburn University, Bugwood.org



Figure 13. Adult buck moths, *Hemileuca maia* (Drury), mating. Credits: Howell C. Curtis

Hosts

The larvae of the buck moth feed on oaks, *Quercus* spp., and when it is present they preferentially feed on the scrub oak, *Quercus ilicifolia* (Covell 1984, Wagner 2005). Smith (1974) successfully reared the larvae on willow, *Salix* spp.

Medical Importance

The larvae of this subfamily possess multi-branched urticating spines, which deliver a sting when touched. The severity of stings depends upon the species, and ranges from inducing

immediate pain, severe itching, swelling, and redness (Diaz 2005), to causing death through hemorrhaging (when stung by caterpillars of the Neotropical genus *Lonomia*) (Carrijo-Carvalho and Chudzinski-Tavassi 2007). Death from contact with *Lonomia* caterpillars often results from multiple venom exposures due to their gregarious feeding behaviour (Diaz 2005). The caterpillar of the io moth, which occurs in Florida, also defends itself with urticating spines.

The spines in the buck moth occur on raised, sclerotized (hardened) portions of the larva's cuticle that are known as tubercles and scoli. The spines found on these structures are associated with venom glands that occur within the caterpillar's body. According to Diaz (2005), the sting of the buck moth is similar to that of the saddleback caterpillar, *Achardia stimulea* (Clemens). The sting produces pain immediately, which then spreads to nearby lymphatic nodes. The caterpillar's sting then causes swelling and redness to occur. These symptoms can last for as little as a day to over a week. Wagner (2005) reported that the stings he received from a buck moth caterpillar were still present after ten days and the venom of the caterpillar caused a small hemorrhage where each spine had stung him. According to Diaz (2005), severe reactions to the venom of the buck moth (such as anaphylaxis) are rare. He recommends treating stings from these caterpillars by washing the site immediately in order to remove any loose spines that might be present. The site should be allowed to dry without the use of a towel. Any remaining spines should then be removed with an adhesive such as duct tape. Finally you can apply ice packs to the site to relieve some of the pain. Not handling caterpillars that have spines is one of the best ways to avoid receiving stings.

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Figure 14. Close up, dorsal view of the stinging spines of a buck moth, *Hemileuca maia* (Drury), larva. Credits: James Castner, University of Florida

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