

# MOTHS











**moth - мотылек**

[mɒθ]



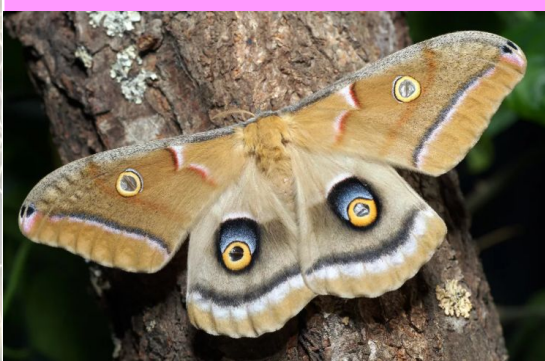
**Hercules moth -  
бабочка Сатурния  
Геркулес**

['hɜ:kjʊli:z mɒθ]



**White witch moth -  
Совка**

[waɪt wɪtʃ mɒθ]



**Atlas moth - бабочка**  
**Павлиноглазка атлас**

[ 'ætɫəs mɒθ ]



**Madagascan sunset  
moth - Урания**  
**Мадагаскарская**

[ mædə 'gæskən 'sʌnset  
mɒθ ]



**Death's-head  
hawkmoth - Бражник**  
**мертвая голова**

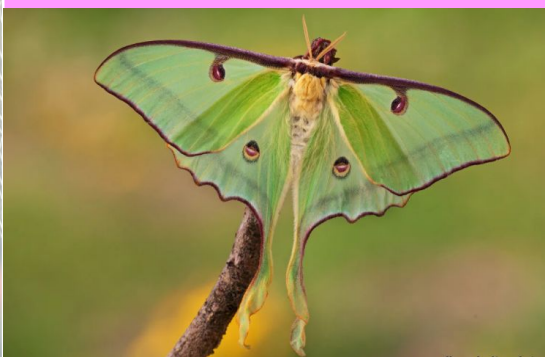
[ deθ 'es-hed hawkmɒθ ]





**Peppered moth -**  
**Пяденица**

[ˈpepəd mɒθ]



**Luna moth - Сатурния**  
**Луна**

[ˈluːnə mɒθ]



**Grease moth - Огнёвка**  
**ДОМОВАЯ**

[ɡriːs mɒθ]



**Emperor gum moth -**  
**Императорский**  
**камедный мотылёк**

[ˈempərə ɡʌm mʌθ]



**Polyphemus moth -**  
**Сатурния Полифема**

[ˈpɒlɪfi:m mʌθ]



**rattlebox moth -**  
**Медведица**  
**красноточечная**

[ˈrattlebɒks mʌθ]



# Moth



**Moths** are a paraphyletic group of insects that includes all members of the order Lepidoptera that are not butterflies, with moths making up the vast majority of the order. There are thought to be approximately 160,000 species of moth, many of which have yet to be described. Most species of moth are nocturnal, but there are also crepuscular and diurnal species.

While the butterflies form a monophyletic group, the moths, comprising the rest of the Lepidoptera, do not. Many attempts have been made to group the superfamilies of the Lepidoptera into natural groups, most of which fail because one of the two groups is not monophyletic: Microlepidoptera and Macrolepidoptera, Heterocera and Rhopalocera, Jugatae and Frenatae, Monotrysia and Ditrysia.

Although the rules for distinguishing moths from butterflies are not well established, one very good guiding principle is that butterflies have thin antennae and (with the exception of the family Hedyllidae) have small balls or clubs at the end of their antennae. Moth antennae are usually feathery with no ball on the end. The divisions are named by this principle: "club-antennae" (Rhopalocera) or "varied-antennae" (Heterocera). Lepidoptera differs between butterflies and other organisms due to evolving a special characteristic of having the tube-like proboscis in the Middle Triassic which allowed them to acquire nectar from flowering plants.



**Moth larvae, or caterpillars, make cocoons from which they emerge as fully grown moths with wings. Some moth caterpillars dig holes in the ground, where they live until they are ready to turn into adult moths.**

**Moths frequently appear to circle artificial lights, although the reason for this behavior (positive phototaxis) is currently unknown. One hypothesis is called celestial or transverse orientation. By maintaining a constant angular relationship to a bright celestial light, such as the moon, they can fly in a straight line. Celestial objects are so far away that, even after travelling great distances, the change in angle between the moth and the light source is negligible; further, the moon will always be in the upper part of the visual field, or on the horizon. When a moth encounters a much closer artificial light and uses it for navigation, the angle changes noticeably after only a short distance, in addition to being often below the horizon. The moth instinctively attempts to correct by turning toward the light, thereby causing airborne moths to come plummeting downward, and resulting in a spiral flight path that gets closer and closer to the light source.**

**Studies have found that light pollution caused by increasing use of artificial lights has either led to a severe decline in moth population in some parts of the world or has severely disrupted nocturnal pollination.**

## Hercules moth





***Coscinocera hercules***, the **Hercules moth**, is a moth of the family Saturniidae, endemic to New Guinea and northern Australia. The species was first described by William Henry Miskin in 1876.

Adults have a wingspan of about 27 centimetres, making it the largest moth found in Australia, and its wings have the largest documented surface area (300 square centimeters) of any living insect. They are mainly colored golden-brown and white, with transparent spots on each of the four wing sections – the coloring and patterns between sexes is mostly static. However, adult males have longer, slimmer tails on their wings than females do, making it somewhat easy to differentiate them in this way.

Their larvae grow up to 12 cm, and will weigh around 29 grams in their final instar. They are a pale-blue or green color, with red dots along their sides and yellow spines.

As an adult, the Hercules moth does not eat. Their larvae will feed on the leaves of rainforest trees such as *Dysoxylum muelleri*, *Glochidion ferdinandi*, *Timonius rumphii*, and *Timonius singularis*, but prefer to eat the leaves of the Bleeding Heart tree.

## White witch moth





**Thysania agrippina** is a species of moth in the family Erebidae first described by Pieter Cramer in 1776. The most commonly accepted English name is the white witch. Other common names include the ghost moth, great grey witch and great owlet moth. *Thysania agrippina* is of interest as a competitor for title of "largest insect". This may be true by the measure of wingspan – a Brazilian specimen with a wingspan of almost 30 cm appears to hold the record. The Atlas moth and Hercules moth, however, have greater wing areas. The white witch occurs from Uruguay to Mexico, and appears as a stray as far north as Texas in the U.S. Collection dates shows no discernible pattern with respect to location or season.

Given the enormous geographic range of the adult, and observations that date back 300 years, it is striking that the immature life stages of this species have never been documented (notwithstanding the erroneous Merian painting). Long migratory flight is likely, given that the close relatives *Thysania zenobia* (the owl moth) and *Ascalapha odorata* (the black witch) are known for flights that reach far north of the host plant distributions. Based on the larval host plants recorded for the owl moth and black witch, the larval host plants for the white witch are probably also woody members of Fabaceae (subfamily Caesalpinioideae), possibly *Senna* and/or *Cassia*.

White is a project led by the lepidopterist David L. Wagner at the University of Connecticut, seeking to identify the immature stages of the white witch. A key strategy: to obtain a gravid female and attempt rearing on likely hosts. The participants maintain a website, and an active citizen science project on iNaturalist.

## Atlas moth





**Attacus atlas**, the **Atlas moth**, is a large saturniid moth endemic to the forests of Asia. The species was first described by Carl Linnaeus in his 1758 10th edition of *Systema Naturae*.

The Atlas moth is one of the largest lepidopterans, with a wingspan measuring up to 24 cm and a wing surface area of about 160 cm<sup>2</sup>. It is only surpassed in wingspan by the white witch and *Attacus caesar*, and in wing surface area by the Hercules moth. As in most Lepidoptera, females are noticeably larger and heavier than males, while males have broader antennae.

The body is disproportionately small compared to the wings. The upperside of the wings are reddish brown with a pattern of black, white, pink, and purple lines and triangular, scale-less windows bordered in black. The undersides of the wings are paler. Both forewings have a prominent extension at the tip, with markings that resemble the head of a snake, a resemblance which is exaggerated by movements of the wings when the moth is confronted by potential predators.

The Atlas moth has a very short, vestigial proboscis, and they do not eat once they have emerged from the cocoon, relying on fat storage for energy. Every flight takes valuable energy and can take days off their already short lives, as it has a very short life span of only one to two weeks. They conserve energy by flying as little as possible. A female will wait for a male to come along and be fertilised, lay eggs and die.

## Madagascan sunset moth





**Chrysidia rhipheus**, the **Madagascan sunset moth**, is a species of day-flying moth of the family Uraniidae. It is considered one of the most impressive and appealing-looking lepidopterans. Famous worldwide, it is featured in most coffee table books on Lepidoptera and is much sought after by collectors, though many older sources misspell the species name as "rhipheus". It is very colourful, though the iridescent parts of the wings do not have pigment; rather the colours originate from optical interference. Adults have a wingspan of 7-9 cm.

Dru Drury, who described the moth in 1773, placed it in the genus *Papilio*, considering it a butterfly. Jacob Hübner placed it in the moth genus *Chrysidia* in 1823. Later redescriptions led to junior synonyms such as *Chrysidia madagascariensis*.

At first the moth was thought to be from China or Bengal, but was later found to be endemic to Madagascar. It is found throughout the year in most parts of the island, with peak populations between March and August, and smallest numbers between October and December. Females lay about 80 eggs under the leaves of *Omphalea* spp. The caterpillars are whitish yellow with black spots and red feet and are covered in club-ended black setae. Silk spun from the mouth helps the caterpillars hold on to smooth leaves and climb back to the plant when they fall. This silk has also been known to cause a euphoric high to those who consume it. After completing four instars, the caterpillars spin an open network cocoon. The pupal stage lasts from 17 to 23 days.

**Chrysiridia rhipheus** is the sole specialist herbivore of the four species of *Omphalea* in Madagascar. *Omphalea* is toxic: the toxins are sequestered by the feeding caterpillar and retained in the pupal and adult stages. Thousands of these moths migrate between the eastern and western ranges of their host plants.

**Chrysiridia rhipheus** has a wingspan of 7–9 centimetres, and sometimes up to 11 centimetres. Moths from the highlands, 900–1,080 metres, have a median wingspan of 7 cm; moths from lower altitudes, 600 m, have a median wingspan of 9 cm. Like many other uraniine moths, the sunset moth has an uncanny resemblance to swallowtail butterflies, especially in its tails and colourful wings, and can easily be mistaken for a butterfly.

The sunset moth is black with iridescent red, blue and green markings. There is a fringe of white scales on the wing edges, wider on the hindwings. The moth has six tails, very often lost or damaged during its life. Pattern variations are common, and the moth is often partly asymmetrical; one of the factors causing this is temperature shock during the pupal stage.

Drury's specimen was given to him by Captain May of Hammersmith and believed to have come from China. Cramer believed the specimen came from Chandernagore in Bengal, however, giving rise to the French name "page de Chadernagor".



It is now known that *Chrysidia rhipheus* is endemic to Madagascar. Thousands of adult moths seasonally migrate between geographically isolated populations of their host plant *Omphalea* spp. They can be found almost everywhere on the island, except in the south-west and the extreme subdesertic south of the Androy where their host plant is absent. They migrate from the three species in the dry deciduous forest in the west to the eastern rainforest species. The western species are largely in protected areas. The eastern species, on the other hand, is mostly unprotected and dispersed in widely scattered populations threatened by deforestation. Being the only evergreen species, *O. oppositifolia* is probably crucial for the moth's survival. The Jamaican moth *Urania sloanus*, from the same subfamily, most likely became extinct after the loss of one of its host plant species.

The moths migrate in response to changes in the host plants. *Chrysidia* larvae defoliate the whole plant, and even eat the flowers and fruit, and thus have a considerable negative impact on the reproduction and survival of seedlings. The plants probably react by changing their nutrient and secondary compound levels, becoming toxic to the larvae and causing high mortality. *Omphalea* populations that are not damaged by moths for long periods of time have lower toxicity. These factors cause mass increases in local population, followed by sudden crashes. The population crashes might result from increased larval mortality, but are more likely caused by the emigration of the adult moths. Through semiochemicals, the plant may recruit hymenopteran parasitoids as a protection, hence playing a role in the population dynamics of the moth.

## Death's-head hawkmoth





The name **death's-head hawkmoth** refers to any of three moth species of the genus *Acherontia*. The former species is found in Europe and throughout Africa, the latter two are Asian; most uses of the common name refer to the European species. These moths are easily distinguishable by the vaguely human skull-shaped pattern of markings on the thorax. They are large nocturnal moths with brown and yellow or orange coloring, and all three species are fairly similar in size, coloration and life cycle.

The African death's-head hawkmoth is the largest moth in the British Isles, with a wingspan of 13 cm; it is a powerful flier, having sometimes been found on ships far from land. The forewings are a mottled dark brown and pale brown, and the hind wings are orangey-buff with two narrow dark bands parallel with the hind margin. The abdomen is a similar orangey-brown, with a broad, dark dorsal stripe. The most notable feature is a patch of short yellowish hairs on the thorax that gives the impression of depicting a human skull. It is a striking insect, but is seldom seen because it flies late in the night.

The caterpillar of the African death's-head hawkmoth is also sturdy and somewhat variable in colour, being some shade of buff, green or brown, with seven diagonal blue lines. At the rear is a curved, thorn-like horn. It can attain a length of 13 to 15 cm. The other two species of death's-head hawkmoth similarly have three larval color forms: typically, green, brown and yellow. The pupa is stout and reddish-brown, and is formed 20 to 25 cm under the ground in a chamber the size of a large hen's egg.

## Peppered moth





The **peppered moth** is a temperate species of night-flying moth. It is mostly found in the northern hemisphere in places like Asia, Europe and North America. Peppered moth evolution is an example of population genetics and natural selection.

The caterpillars of the peppered moth not only mimic the form but also the colour of a twig. Recent research indicates that the caterpillars can sense the twig's colour with their skin and match their body colour to the background to protect themselves from predators.

The wingspan ranges from 45 mm to 62 mm (median 55 mm). It is relatively stout-bodied, with forewings relatively narrow-elongate. The wings are white, "peppered" with black, and with more-or-less distinct cross lines, also black. These transverse wing lines and "peppered" maculation (spotting) can also, in rare instances, be gray or brown; the spotting pattern, in particularly very rare cases, is sometimes a combination of brown and black/gray. The black speckling varies in amount, in some examples it is almost absent, whilst in others it is so dense that the wings appear to be black sprinkled with white. The antennae of males are strongly bipectinate. Prout (1912-16) gives an account of the forms and congeners.

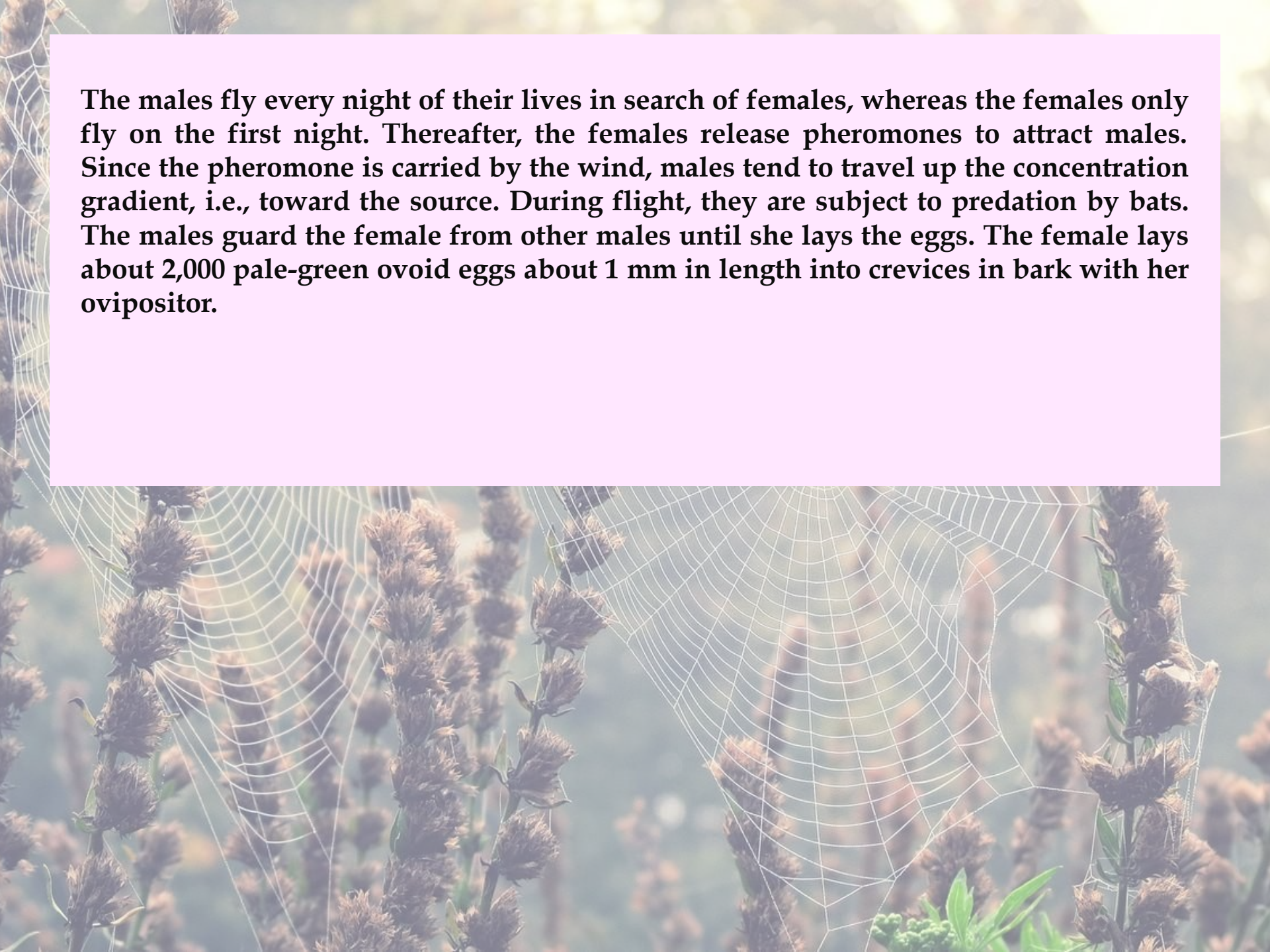
*Biston betularia* is found in China (Heilongjiang, Jilin, Inner Mongolia, Beijing, Hebei, Shanxi, Shandong, Henan, Shaanxi, Ningxia, Gansu, Qinghai, Xinjiang, Fujian, Sichuan, Yunnan, Tibet), Russia, Mongolia, Japan, North Korea, South Korea, Nepal, Kazakhstan, Kyrgyzstan, Turkmenistan, Georgia, Azerbaijan, Armenia, Europe and North America.

In Great Britain and Ireland, the peppered moth is univoltine (i.e., it has one generation per year), whilst in south-eastern North America it is bivoltine (two generations per year). The lepidopteran life cycle consists of four stages: ova (eggs), several larval instars (caterpillars), pupae, which overwinter live in the soil, and imagines (adults). During the day, the moths typically rest on trees, where they are preyed on by birds.

The caterpillar is a twig mimic, varying in colour between green and brown. On a historical note, it was one of the first animals to be identified as being camouflaged with countershading to make it appear flat (shading being the main visual cue that makes things appear solid), in a paper by Edward Bagnall Poulton in 1887. Research indicates that the caterpillars can sense the twig's colour with their skin and match their body colour to the background to protect themselves from predators, an ability to camouflage themselves also found in cephalopods, chameleons and some fish, although this colour change is rather slower in the caterpillars.

It goes into the soil late in the season, where it pupates in order to spend the winter. The imagines emerge from the pupae between late May and August, the males slightly before the females (this is common and expected from sexual selection). They emerge late in the day and dry their wings before flying that night.



The background of the slide features a delicate spider web stretched across the frame. The web is composed of fine, white threads that create a complex, concentric pattern. It is set against a backdrop of a plant with several upright stems, each bearing a series of brown, fuzzy flower heads. The lighting is soft and natural, highlighting the intricate details of the web and the texture of the plant's flowers. The overall scene is a close-up, capturing the fine details of the natural world.

**The males fly every night of their lives in search of females, whereas the females only fly on the first night. Thereafter, the females release pheromones to attract males. Since the pheromone is carried by the wind, males tend to travel up the concentration gradient, i.e., toward the source. During flight, they are subject to predation by bats. The males guard the female from other males until she lays the eggs. The female lays about 2,000 pale-green ovoid eggs about 1 mm in length into crevices in bark with her ovipositor.**

## Luna moth





The **Luna moth** is a Nearctic moth in the family Saturniidae, subfamily Saturniinae, a group commonly known as giant silk moths. It has lime-green colored wings and a white body. The larvae (caterpillars) are also green. Typically, it has a wingspan of roughly 114 mm, but can exceed 178 mm, making it one of the larger moths in North America. Across Canada, it has one generation per year, with the winged adults appearing in late May or early June, whereas farther south it will have two or even three generations per year, the first appearance as early as March in southern parts of the United States.

As defense mechanisms, larvae emit clicks as a warning and can also regurgitate intestinal contents, confirmed as having a deterrent effect on a variety of predators. The elongated tails of the hindwings are thought to confuse the echolocation detection used by predatory bats. A parasitic fly deliberately introduced to North America to be a biological control for the invasive species gypsy moth appears to have had a negative impact on Luna moths and other native moths.

The Luna moth is found in North America, from east of the Great Plains in the United States - Florida to Maine, and from Saskatchewan eastward through central Quebec to Nova Scotia in Canada. Luna moths are also rarely found in Western Europe as vagrants.

Eggs, attached in small groups to undersides of leaves, are mottled white and brown, slightly oval, and roughly 1.5 millimeters in diameter. Larvae are primarily green, with sparse hairs. The first instar, emerging from the egg, reaches a length of 6–8 mm, the second 9–10 mm, the third 12–16 mm and the fourth 23–26 mm. The fifth (final) instar grows to approximately 70–90 mm in length. Small, colorful dots – yellow or magenta – may line the sides of the fourth and fifth instars. The larvae may take on a reddish-brown color just prior to cocooning. Fifth-instar larvae descend to the ground and use silk to bind dead leaves around the cocoon.

The imagoes (winged, sexually mature), often referred to as 'adult moths,' emerge from the pupae with the wings small, crumpled and held close to the body. Over a period of several hours the wings will enlarge to full size. Wingspan is typically 8–11.5 cm, and in rare instances as much as 17.78 cm. Females and males are similar in size and appearance: green wings, eyespots on both forewings and hind wings, and long, sometimes somewhat twisted tails extending from the back edge of the hindwings. Bodies are white and hairy. Adults have vestigial mouthparts and do not feed. Energy is from fat stores created while a caterpillar. The forward edge of the forewing is dark-colored and thick, tapering in thickness from the thorax to the wing tip. Its color can range from maroon to brown. The eyespots, one per wing, are oval in shape on the forewings and round on the hindwings. Each eyespot can have arcs of black, blue, red, yellow, green or white. The eyespots are thought to confuse potential predators.



## Grease moth



***Aglossa cuprina***, the **grease moth**, is a snout moth, family Pyralidae, described by Philipp Christoph Zeller in 1872. The grease moth is closely related to the genus *Pyralis*, and as a result, is usually associated with the meal moth, *Pyralis farinalis*.

*Aglossa cuprina* ingests grease produced by the bacteria that feed on decaying matter.

The egg of *A. cuprina* is an off white rounded oval. During the larval stage, *A. cuprina* has a brownish head and greyish body. The *A. cuprina* larvae also have black mandibles and a black peritreme (part of the integument of an insect which surrounds the spiracles). They can be distinguished from *A. caprealis* larvae by setal differences. The pupae are reddish brown with six curved, hooked setae.

The moth has a wingspan that averages about an inch and a half (38 mm), and exhibits an overall dark, greyish-brown colour. While the forewings are brownish grey with pale yellowish markings (much like those of a tabby cat, hence the lesser-used common name), the top of the head and neck are simply pale yellow. *A. cuprina* is also known for its filiform (thread-like) antennae.



*A. cuprina* has been found in Europe, Asia, Australia, North America and South America. *A. cuprina* is distributed throughout eastern North America and sightings have been recorded in California, Arkansas, Arizona, Connecticut, the District of Columbia, Delaware, Florida, Illinois, Massachusetts, Maryland, Missouri, North Carolina, New Hampshire, New Jersey, New York, Pennsylvania, South Carolina, Texas and Wisconsin. The moth stage is generally found in early summer between the months of May and August.

They tend to inhabit areas around or in human habitation and buildings. When found in homes, they are generally found in the kitchen and more specifically in the pantry where their choice food source is stored. They are also commonly found in areas where dried grain products are stored, for example, warehouses and areas of grain elevators that remain undisturbed.

*Aglossa cuprina* has similar feeding habits to those of the grains moths. The larval stages feed primarily on dried grain based products including corn meal, whole wheat flour, graham flour, granola, and dried oats. The adults feed on butter, suet and grease, and have even been found in excrement. They have been known to feed on dried remains of other insects as well. The adults fly at dusk between June and July. They hide in dark corners during the day and can be found in stables, outhouses, barns, warehouses, and cellars. They are also attracted to light and sugar.

## Emperor gum moth





***Opodiphthera eucalypti***, the **emperor gum moth**, is a species of moth in the family Saturniidae native to Australia. This species was formerly placed in the genus *Antheraea*.

The emperor gum moth may inhabit all states of Australia, however it is scarce in the more southerly states where the climate is less suitable. They are also found as an introduced species on both the North and South Islands of New Zealand.

Caterpillars can usually be found on young adult leaves between October and March (the Australian Spring and Summer). When the caterpillars hatch they are black with short hairs on top of small nodes on their bodies called tubercles. The hairs are not poisonous and will not sting. As the caterpillars mature they change color each time they shed their skin (which totals to five stages in the caterpillar's appearance). The fully grown caterpillars are usually found on the highest branches of the host tree where the leaves are the youngest and easiest to digest. By the final stage before pupation the caterpillars have developed striking coloration, having a yellow/cream stripe down their bright green/blue body and nodes of red and blue. Despite this they are still surprisingly hard to spot. The caterpillar stage in the emperor gum moth's life cycle can last for many weeks, depending on the temperature and weather conditions.

When the caterpillar is fully mature it spins a dark brown silken cocoon on a branch which usually has a leaf to protect it with. When spinning is complete, the caterpillar sheds its final skin and takes the form of its pupal life stage.

Within a day of spinning completion, the cocoon sets to a hard waterproof shell with a rough exterior and a smooth interior wall. Air holes can be seen along the side of the cocoon indicating that the cocoon is probably otherwise airtight. The moth usually emerges from the cocoon the following year (in Spring or early Summer) but depending on weather conditions can stay in the cocoon from anywhere between two and five years. One case has even been recorded of a moth emerging out of the cocoon after 10 years.

When the metamorphosis is complete, the adult moth regurgitates a fluid to soften the tough cocoon and then cuts a hole using sharp hooks on the base of each forewing. The effort to release itself from the cocoon is vital for its wings to expand and dry after emerging. Pupae cut from the cocoon will hatch, but the moths' wings will never expand.

The emperor gum moth does not feed after it emerges from the cocoon, relying solely on the energy it stored as a caterpillar. Their adult life span is limited to a couple of weeks in which they mate, lay eggs and die. The moths, like the caterpillars, are very striking in appearance. The emperor gum moth is a very large moth, having a wingspan of 120 to 150 mm. Females are generally larger than males. The furry wings and body are multi-colored, but are in overall tones of pale reddish/brown. The wings are decorated with four prominent 'eyes' and various other markings in a symmetrical formation. The antennae of the males are feathery, while the females' are thinner and with fewer hairs.



## Polyphemus moth



***Antheraea polyphemus***, the **Polyphemus moth**, is a North American member of the family Saturniidae, the giant silk moths. It is a tan-colored moth, with an average wingspan of 15 cm. The most notable feature of the moth is its large, purplish eyespots on its two hindwings. The eyespots give it its name – from the Greek myth of the cyclops Polyphemus. The species was first described by Pieter Cramer in 1776. The species is widespread in continental North America, with local populations found throughout subarctic Canada and the United States. The caterpillar can eat 86,000 times its weight at emergence in a little less than two months.

The life cycle of the moth is much like that of any other Saturniidae species. It lays flat, light-brown eggs on the leaves of a number of host plants, including: birch, willow, oak, maple, American elm.

When the eggs hatch, small yellow caterpillars emerge. As the caterpillars age, they molt five times (the fifth being into a pupa). Each instar is slightly different, but on their fifth and final instar, they become bright green with silver spots on their sides. They feed heavily on their host plant and can grow up to 3–4 inches long. They then spin cocoons of brown silk, usually wrapped in leaves of the host plant.



Two broods generally hatch each year throughout the United States, one in early spring and one in late summer. The moths eclose and then must pump their wings with fluid (hemolymph) to extend them. The females emit pheromones, which the male can detect through his large, plumose (feathery) antennae. Males can fly for miles to reach a female. After the moths mate, the female spends the majority of the remainder of her life laying eggs, while the male may mate several more times. Adults of this family of moths have vestigial mouths, meaning their mouth parts have been reduced. Because of this, they do not eat and only live as adults for less than one week.

In captivity, this moth is much more difficult to breed than other American saturniids such as *Hyalophora cecropia*, *Callosamia promethea*, or *Actias luna*. Kept in a cage, the male and female tend to ignore each other, unless a food plant (particularly oak leaves) is present.

## Rattlebox moth





***Utetheisa ornatrix***, also called the **bella moth**, **ornate moth** or **rattlebox moth** is a moth of the subfamily Arctiinae. It is aposematically colored ranging from pink, red, orange and yellow to white coloration with black markings arranged in varying patterns on its wings. It has a wingspan of 33–46 mm. Moths reside in temperate midwestern and eastern North America as well as throughout Mexico and other parts of Central America. Unlike most moths, the bella moth is diurnal. Formerly, the bella moth or beautiful utetheisa of temperate eastern North America was separated as *Utetheisa bella*. Now it is united with the bella moth in *Utetheisa ornatrix*.

The larvae usually feed on *Crotalaria* species, which contain poisonous alkaloid compounds that render them unpalatable to most predators. Larvae may prey on other bella moth larvae in order to compensate for any alkaloid deficiency.

The bella moth also demonstrates complex mating strategies and is thus an excellent model to study sexual selection. Females mate multiply and receive spermatophores containing sperm, nutrients and alkaloid compounds from numerous males as nuptial gifts. Females choose males according to the intensity of a courtship hormone, hydroxydanaidal, and carry out a sperm selection process after copulation with various males.

**Utetheisa ornatrix** is found in the southeastern United States, ranging from Connecticut westward to southeastern Nebraska and southward to southern New Mexico and Florida. This species is found to be more common in the southern part of this range, in accordance to the availability of its host plant in more southern regions. It is also found throughout Mexico, South America, and Central America.

The eggs of the *Utetheisa ornatrix* are spherical in shape and range in colour from white to yellow to sometimes brown.

The larvae are orange and brown with irregular black bands on each segment of the body. The anterior and posterior portions of the black binds are also marked with distinct white spots. Full grown larvae reach 30-35mm in length. Although most arctiid larvae have verrucae, *Utetheisa ornatrix* larvae lack these.

The pupae are mostly black marked with irregular orange and brown bands. Usually, the pupae are covered with a loose layer of silk, but not.

These moths are aposematic and use their bright coloration to warn predators of their unpalatability. Their wings range in color from yellow, red, pink, and orange to white. Wings contain white bands containing irregularly spaced black spots. The hind wings can be bright pink with a marginal black band. The adult *Utetheisa ornatrix* has a wingspan of 33-46mm.