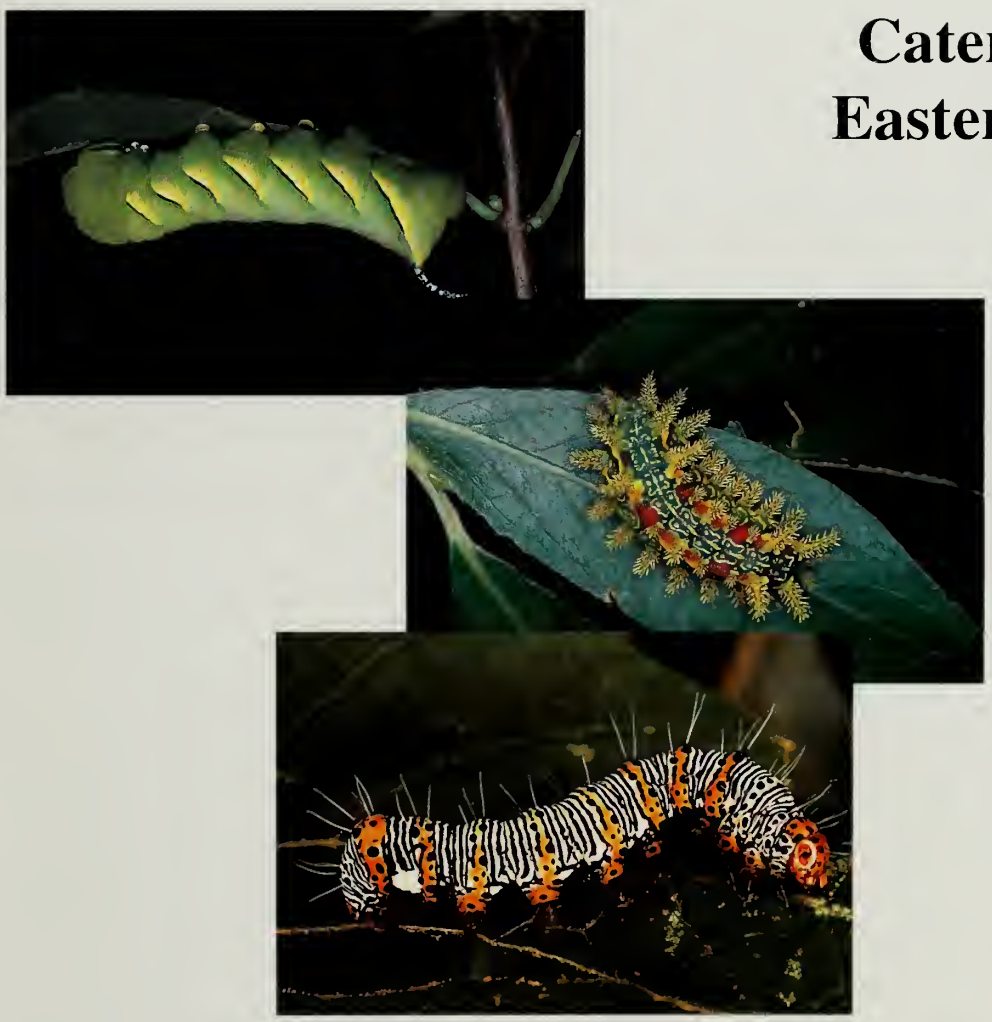
Forest Health Technology Enterprise Team

TECHNOLOGY
TRANSFER

Identification of Caterpillars

Caterpillars of Eastern Forests



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Dedication

To Tom and Polly, for the life and love they shared — DLW

Contents

Caterpillars of Eastern Forests

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Introduction

For better and for worse, caterpillars are integral to the health of our forests. Populations of more than 20 species of eastern forest Lepidoptera may reach densities that result in the defoliation of hundreds or thousands of acres. Tannins, alkaloids, mineral spirits, latexes, spices, and many pharmaceuticals are manufactured by plants, at least in part, to deter hungry caterpillars. Caterpillars are the dietary staple of many forest mammals and birds, and without them there would be fewer songbirds to welcome each spring. Some caterpillars ingest fallen leaves, thereby hastening decomposition and soil formation.

Despite these and many other roles that caterpillars play in forest ecosystems, there is but modest literature for their identification. Moreover, much of what is written is technical in nature, out of print, or focused on a single family.

Our intent in preparing this guide is to enable forest managers, extension entomologists, and nonspecialists to identify many of the eastern region's most frequently encountered species. It is also our wish that this guide will promote a greater appreciation for the remarkable caterpillar biodiversity of eastern forest and woodland ecosystems.

Life Cycle

Butterflies and moths pass through four developmental stages: egg, larva, pupa, and adult. The larval or caterpillar stage has many vernacular names: inchworm, looper, cutworm, fruitworm, hornworm, silkworm, and even woolly bear. It is the growth stage for Lepidoptera, and thus the daily agenda is simple: eat, eat, avoid being eaten, and eat! The monarch increases its mass by 30,000 times as a caterpillar. In order to accommodate this growth, the larva must molt, or shed, its skin multiple times. The larval stages between molts are called instars. The first instar

develops within the egg and lasts until the first molt. In some families there are as few as 3 larval molts, in others more than 15. Most of the species appearing here have 5 larval instars, although in some species (for example, the gypsy moth) it is common for the female caterpillars to go through an extra instar. Presumably this enables females to put on more mass for reproduction and ensures that males will be on the wing before females emerge.

Significant differences in larval behavior, morphology, and coloration may occur between successive instars. Young gypsy moth larvae remain in the canopy both day and night. Beginning in the fourth instar, the caterpillars descend to the boles of trees by day and move back into the canopy at night to feed. Yet even this seemingly stereotyped behavior is modified under high densities, so that late instar larvae may remain in the canopy foliage and feed both night and day. Some dagger moths undergo striking color changes. The cherry dagger (page 28) is green and red with a reddish head capsule in the fourth instar, but then molts into a stunning black and scarlet caterpillar in its last larval instar. Early instars of spicebush swallowtail (page 92), mottled with black and white, closely resemble a bird dropping. Radical changes accompany the molt to the fourth instar when the species takes on a snakelike appearance. Unlike the early instars that lay exposed on leaves, these older larvae use silk to fashion a leaf shelter in which they rest. In general, we have tried to illustrate common color forms of late instar larvae.

Morphology

Although we have tried to minimize the usage of specialized terms, the introduction of some entomological nomenclature is unavoidable. A brief review of the basic terminology for caterpillar anatomy (figure 1) follows.

The head (figure 2) bears 6 lateral eyes (the **stemmata**) that are usually arranged in a crude circle—other insect larvae resembling caterpillars have only a single lateral eye. Short **antennae** are positioned between the mouthparts and the lateral eyes. The **labrum**, or upper lip, may be cleft, with the notch engaging the leaf while the larva is feeding. A second diagnostic feature shared by all true caterpillars is an inverted Y that runs down the middle of the face (figure 2). The lower arms of the Y delimit the frons, or **frontal triangle**; the upper portion extends back to the thorax. The 3 thoracic segments each bear a pair of segmented (true) legs with a terminal claw, the **thoracic legs**. On the dorsal, or upper side, of the first thoracic segment, there is commonly a hardened plate called the **prothoracic shield.** The abdomen is composed of 10 segments. Most caterpillars possess 4 pairs of fleshy, unsegmented **midabdominal prolegs** on their third, fourth, fifth, and sixth segments and a pair of **anal prolegs** on the last segment. Because exceptions are numerous, the number and relative size of the prolegs is often important in the recognition of families. The prolegs bear a series of hooks, called **crochets**, that are used by the caterpillar to engage the substrate and maintain their purchase (figures 3 and 4). The number, size, and arrangement of the crochets are often useful in identification. Sawfly immatures are caterpillarlike, but differ in the possession of more than 4 pairs of midabdominal prolegs, none of which bear crochets.

The lateral **spiracles**—the external openings to the caterpillar's respiratory system—can serve as reliable landmarks. All caterpillars have 9 pairs. There is 1 pair on the first thoracic segment; the remaining pairs are located on the first 8 abdominal segments. The thoracic and last abdominal spiracles are often twice the size of those in between. As a matter of course, we use the term **stripe** for those markings that run along the body axis and **band** (broad markings) or **ring** (narrow markings) for those that run around individual segments. The **integument**, or skin, bears variously modified **setae**. These may be short or long, stiff or downy, sharpened apically or paddlelike; some resemble hairs, others are peglike, scalelike, or spinelike. In a few silkworm, slug, and puss caterpillars, the larvae may inflict a painful sting with specialized poison-filled setae. Below we illustrate many of the features mentioned in the species accounts. We also include a glossary for specialized terminology (page 99).

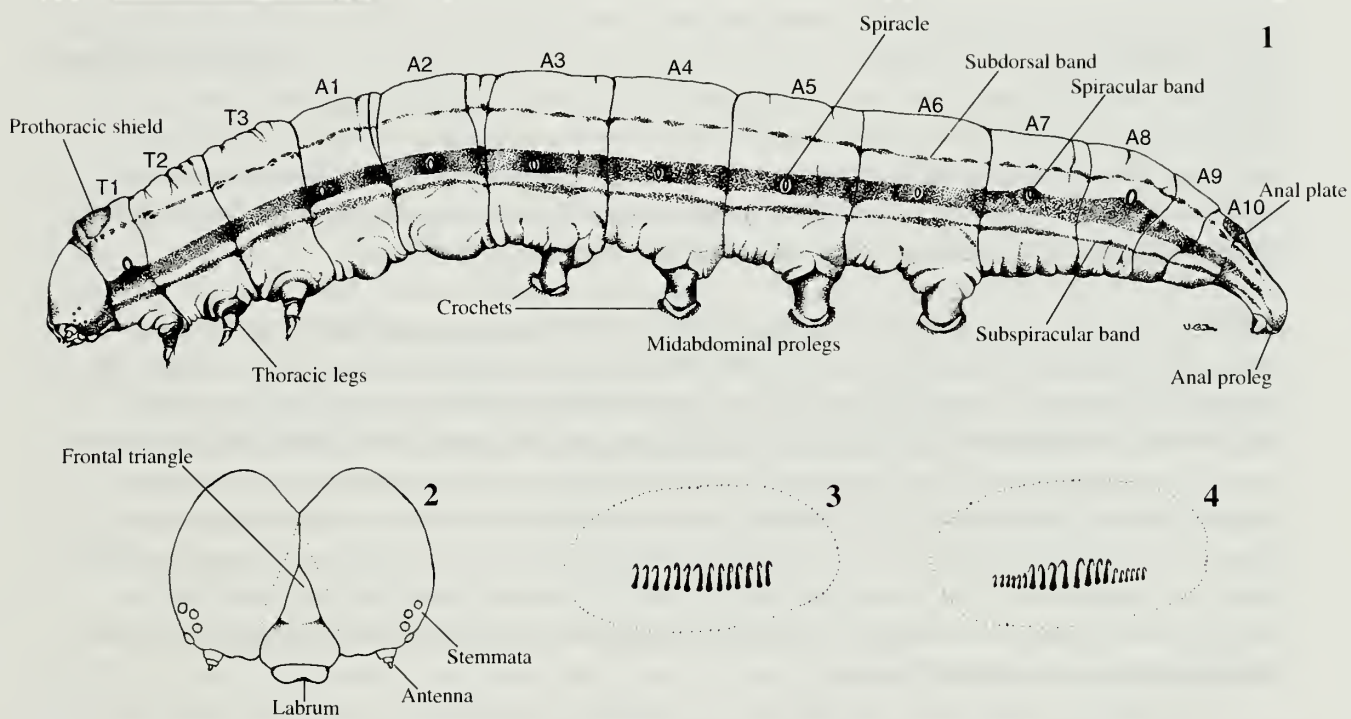


Figure 1—*Diagrammatic sketch of a caterpillar.* **Figure 2**—*Frontal view of caterpillar head.* **Figure 3**—*Crochet arrangement on midabdominal proleg of a noctuid.* **Figure 4**—*Crochet arrangement on midabdominal proleg of an arctiid.*

Collecting Caterpillars

Forest caterpillars can always be found by searching foliage, particularly of abundant forest trees like oak, hickory, and pine. They may feed exposed or they may fashion shelters in which to hide or feed. By day many retreat from the foliage and seek out fissures and other hiding places on twigs, branches, or the bole. Some even descend to the forest floor by day, then return to the leaves to feed by cover of night. And of course, exceptions abound. Many are borers in meristems, fruits, flowers, and especially wood (Solomon 1995); others feed on lichens, mosses, fungi, and ferns; still others prefer decomposing leaf litter of the forest floor.

Species with physical or chemical defenses tend to be highly conspicuous, advertising their unpalatability with bright colors—reds, oranges, and yellows offset with black and white. They also tend to be "messy eaters" that leave a telltale path of damaged foliage and excreta or frass, which further facilitates their discovery. Often they feed by day, seemingly unconcerned about the legions of insectivorous birds that share the forest with them. Palatable species, on the other hand, tend to be far less conspicuous in both habit and design—more often than not they are cryptically rendered in greens and browns. Many feed only at night. As a group they are "neat feeders" and may be quick to move off damaged leaves. Sphinx and underwing caterpillars are especially tidy, "covering up their tracks" by clipping away leaves upon which they have fed. After finishing with a leaf, they chew through the petiole and drop incriminating foliage to the forest floor, leaving birds with little that would reveal their whereabouts.

An accumulation of frass pellets or damaged leaves are always good clues—the fresher the signs the more likely that the caterpillar can be located nearby. Many cryptic species play a shell game with their avian predators, moving off damaged leaves onto intact leaves several times each day. Thus any hint of browning or other signs of leaf necrosis often indicate that the perpetrator is long gone. Searches are usually best focused on young foliage, saplings, isolated plants, and plants growing along a forest edge. Because many species feed at night, nighttime walks with a flashlight can be very productive and rewarding for locating caterpillars.

"Beating" is perhaps the most time-efficient method for securing caterpillars from trees or shrubs. The idea is to abruptly jar caterpillars from their resting or feeding sites and collect the dislodged individuals from sheets or drop clothes held below. The sheet can be a hand-held construction (available through biological supply houses) or simply a bed sheet spread over the ground. A short baseball bat or a stout stick rapped against a series of branches will almost always dislodge a few caterpillars. Working only 1 plant species during a collecting episode allows host plant associations to be noted and recorded accurately. In fields and other habitats where the vegetation is low, sweep nets can be used to dislodge caterpillars in an analogous fashion. Collections made during the night will often yield a different set of species than those obtained during daytime collections.

Burlap bands stapled to tree trunks can be used to sample forest lepidopterans that descend from the forest canopy to shelter during the day. A strip of burlap about 8 to 10 inches in width is wrapped about the trunk once or twice, stapled along the top edge, and then slit vertically so that flaps can be lifted and the bark beneath inspected for resting caterpillars. Diversity and abundance of caterpillars peaks in late spring when there is an abundance of young, tender foliage. Except for gypsy moth and other outbreak species, expect no more than 2 to 4 caterpillars for every 10 bands examined. Groups that may be especially well represented under burlap include tussock moths, tent caterpillars, underwing noctuids and their kin, and lithosiine arctiids.

An effort should be made to collect and rear several individuals of each species because many are likely to fall victim to parasitoids and pathogens. Such collections should be cross-labeled so that an adult emergence can be tied to any photographs, preserved specimens, and reared parasitoids. Field-collected larvae that yield natural enemies provide important data on host ranges and hence efforts should be made to preserve and label issuing parasitoids and cadavers killed by pathogens. There is an immediate need to know the host ranges (and impacts) of several introduced parasitoids on our native butterfly and moth fauna. One gypsy moth dipteran parasitoid—*Compsilura concinnata* (Family Tachinidae)—that was still being imported into the United States as recently as 1975 as a classic biological control agent has been reared from more than 200 species of native Lepidoptera.

Collecting Eggs

Often the simplest way to obtain caterpillar "livestock" is to capture mated females and hold them for eggs. Many species will readily deposit eggs if simply confined to a vial or bag for 1 or 2 days. Other species will not lay eggs unless cuttings from a larval food plant are placed into the container. Because some females require a substrate of a certain texture before they will release eggs, adding bark or toweling to the holding container can be helpful. Females can be maintained for longer periods by providing them with a honey or sugar water solution (add about 1.25 ounces of honey or sugar to 1 cup water). The solution can be offered in a saturated cotton ball—it is often helpful to uncoil the female's tongue and place its end in contact with the solution. Assuming the female is identified, this method has the advantage of yielding numerous individuals of a single, known entity. Well-preserved vouchers from such rearings have great scientific value.

Most species hatch 10 to 20 days after the eggs are laid. Others may overwinter in this stage—the first instars of the eastern tent caterpillar spend as many as 8 or 9 months entombed in their eggs. Eggs often darken just before hatching, and the caterpillar may be visible through the eggshell a day or 2 before hatch. Foliage and other plant materials left with eggs should be monitored, because molds may develop that can destroy the eggs. If there is doubt about an appropriate food, offer the young larvae a salad of plant species. The greater the uncertainty, the broader the selection you might offer. We suggest you start with black cherry and oak; birch, blueberry, and willow also are accepted by many species. If the species' identity is known, consult Covell (1984) or other references cited in the back of this guide for hosts occurring in your area. Younger leaves are preferred by many species—fully mature, hardened foliage can be lethal to many spring-feeding taxa. Conversely, mid-summer and late summer species often show a preference for older leaves.

Verifying Identification

The pictures and descriptions presented in this guide will assist you in making correct identifications for many common moth and butterfly species. Nevertheless, we cannot overstate the importance of documenting your observations or collections. In many cases you will want to rear the caterpillar to the adult stage in order to verify the identification. There are many field guides and illustrated works on adults, and, not surprisingly, there are many entomologists who can identify adult Lepidoptera. Photographs or other image-capture techniques can be used to record details of pattern and coloration—these can be essential should your caterpillar succumb to natural enemies or handling errors before it can emerge as an adult. If positive identification is needed and multiple examples are available, we recommend preserving 1 or 2 voucher specimens that can be sent to specialists and/or deposited in a public institution.

Rearing Caterpillars

A combination of common sense and reasonable vigilance will ensure considerable rearing success:

- Provide a constant supply of fresh food
- Remove bad foliage and excreta before molds develop
- Avoid saturated atmospheres, as high moisture levels promote infection and disease
- Avoid overcrowding, as it facilitates the transmission of disease and results in some stunting
- Do not disturb the larvae while they are in the process of molting or metamorphosis
- Leave cocoons and pupation chambers intact
- Rear individuals separately, if you have one of the few cannibalistic species

Closed containers such as vials and plastic bags will keep the foliage fresh over longer periods, but they tend to have high humidities that promote the growth of molds. Sprigs of foliage in miniature vases or water picks can be utilized to good measure. In this way it is possible to keep the foliage fresh for days even in open containers. "Sleaving" is a low-maintenance rearing method whereby eggs or larvae are placed in fine meshed bags and secured over a shoot or limb with generous foliage. If enough leaves are sleaved, larvae will complete their development with minimal disturbance. This technique frequently produces a high yield of full-sized adults.

Many species pupate in litter or below ground, so we suggest that you provide a 1-inch layer of slightly moistened sphagnum or peat moss (processed sphagnum) in each rearing container. Sphagnum tends to discourage the growth of molds and releases moisture slowly—this can be especially helpful to those species that spend many months in the prepupal or pupal stage. For

example, many of the moths that specialize on spring foliage as caterpillars may spend 10 months on or below the ground. A few dagger and forester moths require a denser pupation medium, as they normally fashion their pupal chambers in rotten wood. A small chunk of pulpy or punky wood added to the rearing container can greatly increase rearing success with such species.

An extended period of near-freezing temperatures is usually necessary to ensure emergence of species overwintering as larvae or pupae. We have had success holding larvae in a refrigerator at 2 to 5 °C (36 to 41 °F) for several months; a garage or woodshed that does not drop below –4 °C (25 °F) will also serve well. Addition of moisture (simulated rain) will help keep livestock from desiccating over the winter months. Should you decide to bury your collections or cover them with leaves, take precautions to exclude mice and other insectivorous mammals active over the winter months. Many helpful suggestions for collecting and rearing caterpillars can be found in Covell (1984) and Villiard (1969).

Preserving Specimens

Properly preserved specimens provide the most definitive vouchers for identification and taxonomic study. The authoritative descriptions found in monographs and other comprehensive works virtually depend on the availability of preserved material. **Immature stages for about 10% of the moths in Covell's (1984) Peterson *Field Guide to Eastern Moths* are still unknown, and hence by recording life history information, preserving, and photographing immature stages, even the casual observer or backyard naturalist has the opportunity to make important entomological contributions.**

Preferred larval fixatives based on alcohol, formaldehyde, and glacial acetic acid are discussed in Stehr (1987). As an alternative, placing larvae into water that has been brought to a rolling boil and removed from the heat will yield excellent specimens. Once the larva is fully distended (after a few seconds to a minute in hot water) it should be transferred to a vial of 70% ethanol. Caterpillars killed simply by immersion in 70% ethanol frequently turn dark, presumably because microbial activity in the gut continues for some period of time. Regardless of the fluid method chosen, the gut contents often leak out over the first few days—it is often desirable to change the ethanol prior to archival storage. Some success may be obtained by placing caterpillars in a self-defrosting freezer for several months. Although much of the color may be preserved in this way, the specimens end up shrunken and inflexible and are not especially useful as study specimens for taxonomic study.

Many caterpillar pigments are lost in fluids. Greens seem to be especially ephemeral in preserved material. The almost immediate color losses that accompany the fluid preservation of loopers can be most disconcerting. Photographs or other types of image-capturing techniques provide the best means of documenting the coloration of living individuals. Preserved collections should be labeled in full with locality, date of collection, and host and cross referenced to any photographs or reared material.

Photographing Caterpillars

Because many caterpillars have unique coloration and morphology, it is often possible to make accurate identifications from color images, particularly if data on host, date, and other information have been retained with the slide, print, or image file. The best single image is usually a dorsolateral view in which both the head and abdomen are in the plane of focus. A dorsal shot and a close up of the head can be helpful for the identification of many species. In certain groups such as the underwing moths, the coloration of the venter and nature of the subventral fringe may be necessary to determine identity.

Relative to their winged parents, caterpillars are easy subjects for photography. There are few requirements other than a camera with a macro lens. A set of extension tubes or diopters will be needed for full-sized images of smaller instars and species. Although natural light images are often superior to those obtained by flash, we have embraced the latter technique because it allows us to routinely use hand-held exposures at higher F-stops and slower, more fine-grained films.

The images included in this guide were obtained with a variety of systems including Minolta®, Olympus®, and Nikkon® bodies; manual and automatic focusing systems; ring, single, and double-flash units; Ektachrome®, Fujichrome®, and Kodachrome® films, etc. Although we have our decided preferences, it is more important to emphasize that nearly all of today's camera systems have superb optics that will yield excellent images with but minimal experimentation.

A few of our images were obtained in the field, but most were taken in the laboratory. Generally we work sitting down with our arms resting on a counter top, which allows us to rock back and forth through the plane of focus many times before taking a picture. Indoors it is also a simple matter to add supplemental lighting to better illuminate small or dark caterpillars. We can readily change the background to highlight white or black setae or other features that are important in identification.

As noted earlier, the life histories of many North American Lepidoptera are still unknown or poorly described. Diagnostic photographs of the immature stages are lacking for a large number of forest-dwelling moths. **Little caterpillar behavior has been captured on film—in our forests there are lifetimes of rewarding opportunities for even the part-time nature photographer.**

Species Descriptions

There are more than 5,000 species of Lepidoptera found east of the 100th meridian, and it will be decades before we know the life histories for many. This guide can be used to identify 245 species; all but 35 are depicted with a color photograph. We emphasize common, economically important, or otherwise significant species. With but 2 exceptions, we illustrate only macrolepidopteran families, that is, those that contain larger butterflies and moths. The 2 microlepidopteran families include the striking-looking slug caterpillars (Family: Limacodidae) and puss caterpillars (Family: Megalopygidae). Our selection is biased in favor of tree-feeders, especially if oak is commonly used as a food plant. An index with both common and scientific names is provided to help locate each mention of a species, genus, or family.

In this guide, family order follows Covell (1984); within families, similar-appearing caterpillars are grouped together. Each family is introduced with a synopsis that includes a diagnosis. To facilitate field identification, our descriptions emphasize macroscopic characteristics, although a hand lens is helpful when examining arrangements of the crochets on the abdominal prolegs and other minute features. Many families of Lepidoptera are characterized most readily by the arrangement of their setae ("chaetotaxy"), but we did not attempt a discussion of such because our effort would have fallen well short of what is already available in Stehr (1987). For heterogeneous groups like the owlet moths (Family Noctuidae), our family description is valid for many species, but recognize that exceptions are legion. In genera in which 2 or more species are depicted, general features or characteristics of the genus are discussed in the first species account.

For each species, both a common and scientific name are provided. When a different common name exists for the larval and adult stages of the same insect, we list the name for the larva, and include the name for the adult in brackets after the scientific name. For those few instances where a common name was not available, we created one that seemed appropriate given the species' larval morphology or habit. Species accounts include a telegraphic description of diagnostic characters that are present in the last larval instar. Descriptions are based on our slide images and literature cited in the back of this book—forms of highly variable species may not be identifiable. Many identifications in this guide are based on wild larvae that did not complete their development and yield an adult—we use question marks where some uncertainty remains about a species' identity.

Following the diagnosis, we often make mention of species that are likely to be mistaken for the one we describe. Occasionally we include comments on a species' natural history, especially if this information might be useful in identification. Food or host plant associations are extracted from the literature that we list in the back of this guide. We are less inclined to make mention of particular host genera and species for general feeders that are known to accept many food plant species. Detailed information on the number of yearly generations is lacking for many species, and hence our accounts are approximate.

Hornworms (Family Sphingidae)

Hornworms, the larvae of sphinx or hawk moths, are among the largest and most familiar caterpillars. Almost all have a dorsal horn on the eighth abdominal segment, and hence their common name. Each segment is annulated with 6 to 8 shallow creases. Body setae are absent or inconspicuous except in the vicinity of the prolegs. The anal prolegs are flattened and form a triangle below the anal plate. Crochets of 2 lengths are arranged in a series parallel to the body axis. The large frass of hornworms often reveals their presence in a tree or garden. They are commonly encountered as they wander over the ground in search of pupation sites. Upon handling, they may thrash violently from side to side as well as regurgitate over their would-be captors. Food plant associations can be helpful in identification.

Great ash sphinx
(Sphinx chersis)

Pale blue-green or pinkish, white granulose spotting, especially evident on thorax and below spiracles. Head with yellow band from antenna to vertex. Seven pairs of oblique lateral stripes, anterior end extending to above proleg of preceding segment. Anal plate flat above; anal plate and anal prolegs without conspicuous black spotting. Similar to waved sphinx. Food: especially ashes, lilacs, and privets (Oleaceae family). Caterpillar: June through November; 2 generations in South, 1 in North.

Northern apple sphinx
(Sphinx poecila)

Green or blue-green, with indistinct black circlets on thoracic segments and below spiracles on abdominal segments. Head dark green with greenish lateral bands not meeting over top of head. Thoracic segments evenly green. Abdomen with 7 oblique white stripes, edged anteriorly with magenta or lavender, each limited to single segment. Horn blackened, at least laterally. Food: many shrubs and trees, including some softwoods. Caterpillar: April through September; 1 generation.

Laurel sphinx
(*Sphinx kalmiae)*

Stunning, yellow-green with smooth body. Head with dark bands, edged with yellow, well separate at top of head. Thoracic segments evenly green. Abdomen sometimes paler above spiracles, with 7 oblique white stripes edged with black anteriorly and yellow posteriorly, each limited to single segment. Prolegs each with black crescent above base. Horn black with blue mottling. Food: laurels, ashes, lilacs, privets; also reported from poplars. Caterpillar: June through August; 2 generations in South, 1 in North.

Wild cherry sphinx
(*Sphinx drupiferarum*)

Very attractive, yellow-green, smooth. Head with lateral purplish bands that nearly meet over vertex. Thoracic segments evenly green. Abdomen paler above spiracles with 7 oblique yellow or white stripes, edged anteriorly with purple, each limited to single segment. Horn red to purple, yellow at base. Food: especially cherry, plum, and apple species (Rosaceae); also reported from lilacs and hackberries. Caterpillar: June through August; 1 generation.

Pawpaw sphinx
(*Dolba hyloeus*)

Pale green, smooth. Head green without bands. Thoracic legs black with yellow band at base. Abdomen with 6 oblique white stripes, lower end continued forward onto preceding segment, sometimes with dark dorsal edging. Spiracles small, black with white outer ring. Horn attenuate, blue. Food: hollies and related plants, pawpaws, and sweetfern. Caterpillar: June to November; 2 generations in South, 1 in North.

Catalpa sphinx
(*Ceratomia catalpae*)

Markings extremely variable but always some combination of yellow and black. Black dorsum often interrupted with yellow stripes. Sides yellow with short vertical bands, mostly above spiracles; usually with dark line running length of body above legs. Younger caterpillars have less black. Caterpillars are gregarious, occasionally becoming pests. Food: restricted to catalpas. Caterpillar: May through November; 2 generations in South.

Waved sphinx
(*Ceratomia undulosa*)

Greenish (usually) or reddish with 7 pairs of oblique lateral stripes. Head with pink or yellow band running from eyes to crown. Horn pinkish. Similar to great ash sphinx, but lower end of stripes extending only to intersegmental area and lacking white granulose spotting. Additionally, anal plate convex above; anal plate and anal prolegs bear conspicuous black spotting in waved sphinx. Food: ashes preferred, but also lilacs, privets, hawthorns, oaks, and other trees. Caterpillar: April through October; 2 generations in South, 1 in North.

Northern pine sphinx
(*Lapara bombycoides*)

Green with 6 prominent stripes; those below spiracles broader, whiter, and occasionally interrupted. Dorsum, spiracular areas, and prolegs may be marked with wine red patches. Head triangular, front often rusty, and with yellow line running from antenna to crown. Horn absent. Caterpillars of more-southerly **pine sphinx** (*L. coniferarum*) closely similar. Food: pines. Caterpillar: August to September; 1 generation.

Twin-spotted sphinx
(*Smerinthus jamaicensis*)

Pale, yellow or blue-green with cream and occasionally wine red markings, granulose. Thorax with very faint subdorsal line. Head triangular, light green with creamy band running to vertex. Horn attenuate, nearly straight, usually extending beyond rump, often bluish or black dorsally. In **one-eyed sphinx** (*S. cerisyi*), subdorsal stripe well defined and running length of body. Food: many forest trees, especially partial to willows and poplars. Caterpillar: June to November; 2 generations in South, 1 in North.

Blinded sphinx
(*Paonias excaecatus*)

Green or yellow-green, heavily granulose, with markings often obscure; occasionally with wine red spots subdorsally, about spiracles, and prolegs. Thorax usually with faint subdorsal stripe. Head triangular with line of whitened granulose spots running to vertex. Horn somewhat arched below, extending to end of body; granulose, greenish or yellowish apically, often longer than that of small-eyed sphinx. Food: many forest trees. Caterpillar: May to November; 2 generations in South, 1 in North.

Small-eyed sphinx
(*Paonias myops*)

Green, granulose, marked with yellow; often with wine red markings subdorsally, about spiracle and above prolegs. Subdorsal line on thorax absent. Head triangular, green, with or without faint band running to vertex. Horn nearly straight, sometimes shortened, very granulose, usually green and unmarked. Food: many forest trees, especially cherries. Caterpillar: June to November; evidently just 1 generation.

Four-horned sphinx
(*Ceratomia amyntor*) [elm sphinx]

Superb, unmistakable green or brown caterpillar with 4 spinulose thoracic horns. Body covered with white-tipped granules. Dorsal abdominal midline produced as scalelike ridge. Food: elms and basswoods, also reported from birches and cherries. Caterpillar: June through October; 2 generations in South; 1 in North.

Walnut sphinx
(*Cressonia juglandis*)

Green (usually) or red with numerous, minute, raised white granules. Body with 7 pairs of oblique lateral yellow lines, often bearing reddish blotch at dorsal end. Anal horn tinted red. Markings, especially red ones, highly variable. Head pointed with lateral yellow line running from eyes to crown. Caterpillars of *Paonias* are similar but body is less granular and head not as pointed. May produce whistlelike hiss when handled. Food: walnuts, hickories, beeches, and chestnuts are preferred. Caterpillar: May to October; 2 generations in South, 1 in North.

Big poplar sphinx
(*Pachysphinx modesta*)

Pale green, rarely brown or orangish; white granulose spots arranged in rings around body. Head flattened, triangle pinkish, bounded laterally by pale band from eyes to vertex. Three to 6 midabdominal oblique yellow stripes, most conspicuous on second, third, and fourth segments; each stripe continued back onto adjoining segment. Broader oblique pale stripe extending from prolegs on sixth segment onto shortened horn. Food: poplars. Caterpillar: July through November; 2 generations in South, 1 in North.

Hummingbird sphinx
(*Hemaris thysbe*)

Bright lime green or reddish, finely granulose, with yellow subdorsal stripe. Head green or pink, granulose. First thoracic segment raised with yellow or reddish anterior rim framing top of head. Often with yellow to pale orange-red and black bands above each thoracic and abdominal leg. Spiracles red with white at either end. Horn pale lavender-blue or reddish with black granules. Food: various trees and shrubs in honeysuckle and rose families. Caterpillar: May to November; 2 generations in South, 1 in North.

Hog sphinx
(*Darapsa myron*)

Green or brown, with 7 broad oblique stripes fusing into subdorsal stripe that runs to horn. Head with pale medial and lateral bands. Last thoracic and first abdominal segments greatly swollen, and orange spiracles marked with white at either end. Closely similar to **azalea sphinx** *(D. pholus).* Food: grapes, Virginia creeper, and viburnums. Caterpillar: April to November; 2 or more generations in South, 1 in North.

Azalea sphinx
(*Darapsa pholus*)

Green or reddish brown and marked as in hog sphinx. In our collections, less development of oblique lines resulting in less-apparent subdorsal stripe. Horn straight and thornlike (horn of hog sphinx longer, more slender and decidedly curved). Food: azaleas and viburnums. Caterpillar: June to October; 2 generations in South, 1 in North.

Nessus sphinx
(*Amphion floridensis*)

Rather undistinguished, brownish with 8 to 10 oblique brown lines. Head angulate, dark medially and paler green laterally. Dorsum of thorax with black subdorsal stripes. Oblique lateral stripes edged below with paler tans and browns. Top of midabdominal prolegs with dark band. Horn smallish, uniformly dark. Anal plate long and triangular, extending beyond prolegs. May hide at base of plant by day. Food: grape family and peppers. Caterpillar: April to November; 2 generations in South, 1 in North.

Pandora sphinx
(*Eumorpha pandorus*)

Bright green or red-brown with swollen third thorax segment into which head and first 2 thoracic segments can be drawn. Abdomen with small white to yellow spot on segment 2 and large oval spots around spiracle on third to seventh segments. Whiplike horn of early instars replaced with button in last stage. Thorax and anterior abdominal segments with dorsal, black spotting. **Achemon sphinx** (*E. achemon*) brown, orange-brown or yellow-brown, with larger lateral spots divided into 3 compartments. Food: grape family. Caterpillar: June to November; 2 generations in South, 1 in North.

Abbot's sphinx
(*Sphecodina abbottii*)

Two very different forms: form pictured here unmistakable; other form brown, streaked with white and black, and oblique lines that run through spiracles. Head with broad dark band to either side of triangle, edged outwardly with pale band. Caudal horn replaced by eyelike bump. Food: grape family. Caterpillar: May through September; presumably 2 generations in Deep South, 1 generation in North.

Silkworms and Royal Moths (Family Saturniidae)

The silkworm and royal moth family includes many of the largest eastern forest insects. The caterpillars are frequently brought into classrooms and nature centers. They possess long setae, horns, armored knobs, and in 1 subfamily (Hemileucinae) stinging spines. The anal plate is frequently spinulose or heavily armored; the side of the anal proleg often bears a hardened triangular plate. There are often numerous short setae above the prolegs. The crochets of 2 lengths are arranged in a linear series that runs parallel to the body axis. Pest species are often gregarious in early instars. Like hornworms, the large frass pellets of late instars often reveal the caterpillar's whereabouts. Silkworms are so named because they spin generous cocoons of silk, although of lower quality than those of the related **Chinese silkworm** (*Bombyx mori*), grown commercially for silk.

Polyphemus moth
(*Antheraea polyphemus*)

Bright green, with red and silvery spots below setae and steeply oblique yellow lines running through spiracles on abdomen. Darkened rim of anal plate continued onto ninth abdominal segment. Caterpillar of luna moth superficially similar but readily distinguished by characteristics given below. Food: oaks, birches, maples, and many other hardwoods. Caterpillar: March to November; 2 or more generations in South, 1 in North.

Luna moth
(*Actias luna*)

Body bright green with pink or black spotting and numerous short, pale setae. First 8 abdominal segments with yellow spiracular stripe. Spiracles pink or red. Intersegmental areas yellow especially dorsally. Last segment with oblique yellow line above proleg. Food: many forest trees. Caterpillar: all months in South, where there are as many as 3 generations; June and July in North.

Promethea moth
(*Callosamia promethea*)

Chalky green, without hair. Dorsum of second and third thoracic segments with paired red knobs, these black at base. Eighth abdominal segment with unpaired dorsal yellow knob. Sides of body with black spots rimmed with blue. Anal proleg with blackened C-shaped marking. Anal plate decidedly yellow-green. Food: cherries, magnolias, sassafras, spicebush, tulip-tree, buttonbush, ashes, lilacs, and others. Caterpillar: May to September; 2 generations in South, 1 in North.

Sweetbay silkmoth
(*Callosamia securifera*)

Similar to promethea moth but "waxier" appearing. Second and third thoracic segments with orange-red knobs, these yellow and black at base. Faint subspiracular stripe on abdominal segments. Sides of body with smaller black spots not rimmed with blue. Anal plate similar in color to rest of abdomen. Caterpillars of **tulip-tree silkmoth** (*C. angulifera*) often indistinguishable, but exclusively on tulip-tree. Food: sweet bay. Caterpillar: May to October; 2 or 3 generations.

Cecropia moth
(*Hyalophora cecropia*)

Very large, sea green, with prominent dorsal knobs: thoracic knobs orange, abdominal ones yellow. Sides of body with pale blue knobs. **Columbia silkmoth** (*H. columbia*) very similar, but thoracic knobs red, abdominal knobs yellow-pink, and exclusively on larch. Food: maples and cherries preferred, and many other broad-leaved trees and shrubs, including larch. Caterpillar: May to October; 2 or 3 generations in South, 1 in North.

Imperial moth
(*Eacles imperialis*)

Very large, bright green, charcoal and brown, or pinkish with long, white hairlike setae. Dorsum of second and third thoracic segments with prominent spinulose horns. Spiracles white, rimmed with black or blue. Food: pines, oaks, maples, sweet gum, sassafras, and many others. Caterpillar: July to September; 1 generation.

Hickory horned devil
(*Citheronia regalis*) [regal or royal walnut moth]

Largest and most formidable appearing eastern forest insect. Heavily armored with long stout orange and black dorsal horns on thoracic segments. Abdomen with shorter black spines. Despite appearance, harmless to touch (presumably stout spines make it difficult, perhaps even dangerous for birds to swallow). Food: often hickories, walnuts, persimmons, sumacs, sweet gum, and other forest trees. Caterpillar: July to October; 1 generation.

Green-striped mapleworm
(*Dryocampa rubicunda*) [rosy maple moth]

Pale green with longitudinal stripes and often red lateral patch on seventh and eighth abdominal segments. Head reddish brown. Second thoracic segment with black, spinulose horns. Black spines along sides of body below spiracles. Gregarious through third instar. Occasionally a pest. Food: maples, but also oaks and other plants growing with maples. Caterpillar: March to November; up to 3 generations in South; 1 generation in North.

Orange-striped oakworm
(*Anisota senatoria*)

Charcoal black with orange-yellow stripes that fade appreciably in prepupal individuals. Head black. Second thoracic segment with long, black spinulose horns. Abdominal spines relatively small. Gregarious in early instars, then solitary. Occasionally reaches outbreak densities. One related species occurs in southern Ontario, and another in Florida and Georgia. Food: oaks and chestnuts. Caterpillar: August to October; 1 generation.

Spiny oakworm
(*Anisota stigma*)

Highly variable, red, pink, or brown, heavily speckled with white. Head orange-brown. Second thoracic segment with long, black spinulose horns. Dorsal abdominal spines much longer than those of other oakworms described in this guide. Often with indistinct blackish spiracular stripe. Gregarious in early instars, then solitary. Related species, **large-eyed oakworm** (*A. fuscosa*), occurs in Louisiana and Texas. Food: oaks and hazelnuts preferred. Caterpillar: August to November; 1 generation.

Pink-striped oakworm
(*Anisota virginiensis*)

Similar to spiny oakworm but with broad subdorsal and subspiracular pink to red stripes, finely speckled with white. Head orange-brown. Second thoracic segment with long, black spinulose horns. Abdominal spines shorter than those of spiny oakworm. Gregarious in early instars, then solitary. Two other oakworm species with similar caterpillars occur in the South. Food: various hardwoods but strongly favors oaks, especially red and black oaks. Caterpillar: April to October; up to 3 generations in Florida, 1 in North.

New England buck moth
(*Hemileuca lucina*)

Blackish, dappled with few to many yellowish flecks, often with diffuse spiracular stripe. Body densely covered by prominent tufts of branched spines, which tend to be shorter than those of buck moth. Gregarious in early instars then becoming solitary. Spines inflict painful sting followed by swelling. Food: early instars on meadowsweet, but by fourth instar wanders onto oaks, willows, and many other shrubs and trees. Caterpillar: May to July; 1 generation.

Buck moth
(*Hemileuca maia*)

Variable from nearly black to mostly cream, dappled with few to many yellowish flecks, occasionally with diffuse, whitish spiracular stripe. Body densely covered by prominent tufts of branched spines. Gregarious in early instars. Spines inflict painful sting followed by swelling. Occasionally a pest in southern forests and parks. Food: oaks, but wandering late instars on many other shrubs and trees. Caterpillar: April to July; 1 generation.

Io moth
(*Automeris io*)

Pale green with tufts of greenish stinging spines over body. Abdominal segments with conspicuous red spiracular stripe, bordered below by white. Gregarious in early instars, then solitary. Spines inflict painful sting followed by swelling. Food: wide range of hardwoods, even corn and other grasses. Caterpillar: all months; up to 4 generations in southern Florida and Texas, 1 in North.

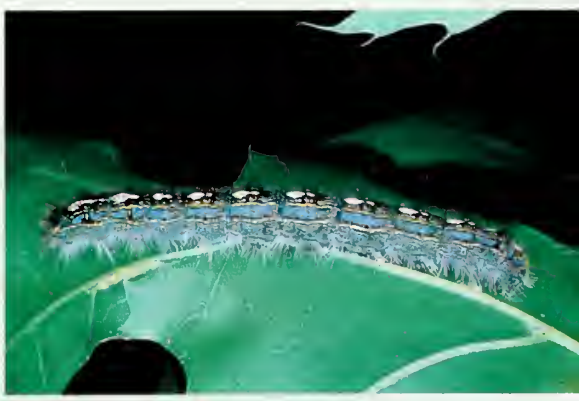
Tent Caterpillars (Family Lasiocampidae)

Tent caterpillars are densely hairy and often brightly colored. The long, downy setae of varying lengths are not clustered into compact tufts or tussocks. The crochets are of 2 lengths in an incomplete ellipse whose axis runs parallel to the body axis. Early instars are gregarious. Caterpillars of the eastern tent caterpillar form communal silken nests. These are the white "tents" seen in the spring, wedged in crotches of trees and shrubs. Tent caterpillars are widely polyphagous eating many forest shrubs and trees.

Eastern tent caterpillar
(Malacosoma americanum)

Orange to black with continuous, yellow-white, middorsal stripe. Bluish spots above spiracles. Setae orange-yellow. Head black. Young caterpillars fashion tent of white silk into which they retreat when not feeding; as caterpillars mature, tent gradually enlarged. Larvae wander considerable distances before spinning yellowish white, powdery cocoons, and affixing them to sides of houses, mailboxes, and other unwelcome sites. Food: cherries and related plants, especially in early instars; later wandering onto other deciduous trees and shrubs. Caterpillar: April to June; 1 generation.

Forest tent caterpillar
(Malacosoma disstria)



Body bluish with middorsal stripe broken into keyholelike spots. Thin subdorsal and lateral orange stripes. Setae fine, whitish at tips. Head bluish mottled with black. Although gregarious through fourth instar, this tent caterpillar does not fashion tent. Occasionally a pest. Food: aspens, gums, maples, oaks, and many other forest and orchard trees. Caterpillar: April to June; 1 generation.

Lappet moth
(*Phyllodesma americana*)

Handsome caterpillar with blue, black, white, and orange dorsum and fleshy, densely hairy lobes (lappets) along sides of body. Dorsum of eighth abdominal segment with unpaired hump. When alarmed, exposes bright orange band across dorsum of second and third thoracic segments. Rests on branches and trunks by day. Food: numerous broadleaf trees and shrubs. Caterpillar: June to August; 1 generation.

Velleda lappet moth
(*Tolype velleda*) [large tolype]

Superbly camouflaged for resting on bark. Grayish body vested with long setae on lateral fleshy lappets. Dorsum of third thorax segment with enlarged set of brown or red-orange knobs; when alarmed exposes dorsal black band from fold behind warts. **Larch tolype** (*T. laricis*) similar but smaller, with enlarged knobs on fifth abdominal segment, and on conifers. Food: wide range of broadleaf trees and shrubs. Caterpillar: June to August; 1 generation.

Apatelodid Moths (Family Apatelodidae)

This small tropical family has only 5 species in North America, 2 of which are widely distributed in the East. The caterpillars are densely hairy, with long prolegs that extend laterally. Eastern species bear middorsal tufts, which are absent in tent caterpillars. The crochets are of 2 alternating lengths (most hairy caterpillars have crochets of a single length or with smaller crochets found only at either end of a series).

Spotted apatelodes
(*Apatelodes torrefacta*)

Body clothed with long yellow or white or gray setae; long black, or orange and black, medial lashes on dorsum of second and third thoracic and eighth abdominal segments. Black chevrons above spiracles. Ends of prolegs red. Food: wide range of trees and shrubs. Caterpillar: June to September; 2 generations.

Tiger Moths (Family Arctiidae)

The tiger moths include many of the familiar caterpillars found wandering about gardens and over roads in the fall. These densely hairy caterpillars tend to be conspicuous in both coloration and habit. The hairlike setae typically bear numerous minute barbs (visible with a hand lens) and may be grouped into lashes or fascicles. Dense body hair may be absent in the algae and lichen-feeding species and *Utetheisa*—the former possess stout barbed spines and an anal comb that is used to flick frass away from the feeding site. Most tiger moth caterpillars have crochets arranged in a linear series with the outermost ones reduced in size (figure 4). The thoracic claws may possess subtending spatulate setae. Most forest species are broadly polyphagous, consuming leaves of a wide range of trees, shrubs, and low growing plants.

Scarlet-winged lichen moth
(*Hypoprepia ?miniata*)

Body dark, dappled with yellow; sparsely covered with stout black, barbed setae. These arising from shiny black warts that bear 1 or 2 setae (3 on some thoracic warts). **Painted lichen moth** (*H. fucosa*) smaller, marked with less yellow, and less distinct middorsal line. Depicted individual has 7 mites feeding upon it. Lichen moth caterpillars can be collected using burlap bands. Food: terrestrial algae and lichens, especially on boles of trees. Caterpillar: overwinters, maturing April to June; 1 generation.

Fall webworm
(*Hyphantria cunea*)

Highly variable from green to smoky black, with abundance of long, silky pale setae. Most setal clusters with at least 1 very long seta twice length of others. Sides usually lighter with yellow, orange, and black pattern. Setae frequently borne from raised yellow, orange, or black bumps. Spiracles white. Tents envelop branch tips while those of eastern tent caterpillar confined to crotches. Food: over 100 forest hardwoods. Caterpillar: May to October in South where it has 2 or more generations, August to October in North.

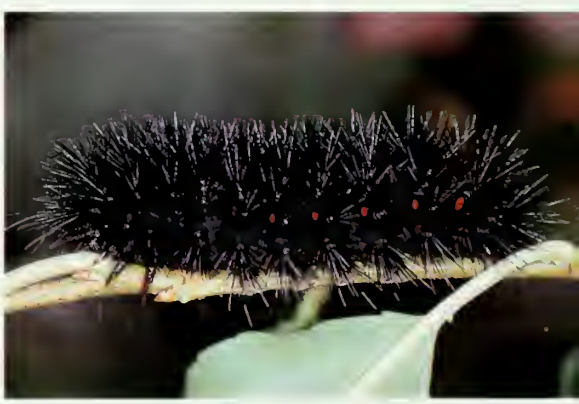
Yellow bear
(*Spilosoma virginica*) [Virginian tiger moth]

Highly variable, ranging from yellow to orange, less commonly reddish brown or black. Densely hairy with warts bearing often more than 30 long, soft setae of varying lengths. Most setal clusters with at least 1 very long fine seta nearly twice length of others in tuft. Spiracles white. Food: broadly polyphagous on low growing plants and shrubs. Caterpillar: May to November; 3 or more generations in South, 1 or 2 in North.

Woolly bear
(*Pyrrharctia isabella*) [Isabella tiger moth]

Familiar, densely hairy black and red-orange caterpillar often seen crossing roads. Setae stiff and roughly of 1 length. Coloration as well as widths of orange and black bands vary considerably, with black portions giving way to orange as caterpillar matures. Food: grasses and forbs. Caterpillar: overwinters, September to May, and again in summer; 2 generations.

Giant leopard moth
(*Ecpantheria scribonia*)



Large caterpillar densely covered with black coarse setae of 1 length. Like woolly bear, rolls up with head held to rear when disturbed. In this posture, red intersegmental rings conspicuous. Spiracles orange or red. Food: polyphagous on low-growing plants, and many forest trees and shrubs. Caterpillar: overwinters, August to May; 1 generation in North.

Pale tussock moth
(*Halysidota tessellaris*) [banded tussock moth]

Gray, dirty tan to yellow-brown with long paired white and black lashes on second and third thoracic segments. Those of second thoracic segment projecting forward beyond head. Eighth abdominal segment with third set of lashes. Dark medial dorsal tufts often forming dorsal line. **Harris' tussock moth** (*H. harrisii*) pale yellow, middorsal tufts only slightly darkened, and without black lashes; evidently restricted to sycamore. Food: oaks, willows, poplars, hickories, and many other forest and shade trees. Caterpillar: July to October; 1 generation.

Hickory tussock moth
(*Lophocampa caryae*)

Distinctive white and black caterpillar. Dorsum of first 8 abdominal segments with short medial black tufts and conspicuous subdorsal black lashes on first and seventh abdominal segments. Gregarious until last instar. Hair allergenic to some people. Food: prefers hickories, walnuts, and related plants but accepting most any shrub or tree. Caterpillar: July to September; 1 generation.

Spotted tussock moth
(*Lophocampa maculata*)

Black at either end with 4 or 5 orange abdominal segments. Numerous thin white lashes arise from black segments—these distinguish it from woolly bear, which it superficially resembles. Orange abdominal band broken by red or black middorsal tufts. Food: prefers willows and poplars but will consume most any shrub or tree. Caterpillar: July to September; 1 generation.

Cutworms or Owlet Moths (Family Noctuidae)

Noctuids are the largest family of Lepidoptera, accounting for more than one-quarter of all described species of butterflies and moths. Owlet moth caterpillars are diverse in both habit and form, and no single character can be used to diagnose the family. Most are rather stout, nearly smooth with inconspicuous setae, rendered in cryptic shades brown and green. Others bear abundant secondary (unbarbed) setae and resemble tiger moth caterpillars. Their crochets are usually of a single length, arranged in a linear series (figure 3). In arctiids the outermost crochets are reduced in size (figure 4), and the hairs are commonly barbed. Species described in this guide include foliage, flower, lichen, and litter feeders, as well as a handful that attack and consume other caterpillars.

Cherry dagger moth
(*Acronicta hasta*)

More than 50 species of dagger moths occur in the East. Although adults of this genus might be described as monotonously white, gray, and black, their caterpillars are delightfully varied. Middle and late instar caterpillars often differ strikingly in coloration. In cherry dagger moth, middle instars bright green with broad yellow and red dorsal stripe; head with red band over vertex forking to either side of triangle, commonly with triangle and cheeks greenish. Last instar charcoal black with stunning red dorsal line; head black, sometimes reddish at top. Both forms sparsely set with soft hairlike setae. Food: cherry species. Caterpillar: June to October; 1 or 2 generations in North.

Ochre dagger moth
(*Acronicta morula*)

Brown, black, and white with raised warts on dorsum of first, fourth, and eighth abdominal segments. Top of head red; triangle with broad black band to either side; sides of head mottled. Warts arranged as transverse line over dorsum of first and second abdominal segments, but form square on eighth segment. White hairs on dorsum short and bladelike; those on side long and downy. Food: especially elms, but also apples, basswoods, and others. Caterpillar: May to October; 2 or more generations.

Lobelia dagger moth
(*Acronicta lobeliae*)

Grayish to charcoal with tan to yellow middorsal and sometimes faint subdorsal stripes. Top of head, frontal triangle, and jaws black or pale and mottled; red patches over vertex; and area around triangle often grayed or whitened, without dark pigmentation. Thoracic hair tufts each with 1 very long black seta that extends forward about head. Dorsum with tannish or orangish patches on first 7 abdominal segments; eighth segment with square of raised warts, anterior pair often darkened. Long, soft white setae along sides. Food: cherries and especially oaks. Caterpillar: May to October; 2 or more generations.

Splendid dagger moth
(*Acronicta superans*)

Bright green with brown-black dorsum edged with yellow, strongly humped eighth segment. Dorsal and subdorsal coloration continued onto head; cheeks pale. Setae above spiracles long, shiny black, and sparse, those on dorsum thickened. Subventral setae, shorter, pale, and more numerous. Food: apples, birches, cherries, mountain ashes, and others. Caterpillar: June to October; 1 or 2 or generations in North.

Smartweed caterpillar
(*Acronicta oblinita*) [smeared dagger moth]

Pattern highly variable but always handsomely marked: generally dark, with dark or reddish dorsal warts bearing tuft of short bristly setae. Head black, shiny. Dorsum with or without abundant white speckling. Yellow, inverted V-shaped blotches separate white spiracles. Four fine setae extend out from others at either end of body. Food: many forbs, shrubs, and trees. Caterpillar: May to October; 2 or more generations in South, 1 or 2 in North.

Afflicted dagger moth
(*Acronicta afflicta*)

Light red-brown, brown, tan, or occasionally green with black spatulate seta to either side of darkened middorsal stripe. Setae along sides of body white, soft, and relatively long. Head same color as body. Spiracles pale ringed with black. Food: oaks and walnuts. Caterpillar: May to October; 1 or 2 generations in North.

Hesitant dagger moth complex
(*Acronicta haesitata* complex)

Green-, yellow-, orange-, or pink-brown with white setae along sides of body. Head pinkish tan, mottled. Dorsum of last thoracic and anterior abdominal segments with irregular white blotches and interrupted middorsal stripe. Rear segments with yellowish subdorsal splotches. Rests with head against side of abdomen in leaf shelter. Several closely related dagger moths—*A. albarufa, A. inclara, A. increta, A. modica,* and *A. ovata*—also on oaks with similarly marked caterpillars. Food: oaks. Caterpillar: June to October; 1 generation in North.

Frosted dagger caterpillar
(*Acronicta hastulifera*)

Moderately large, handsomely outfitted with rusty orange setae, each frosted at tip. Head black. Dorsal setae mostly of 1 length with orange and or mostly black shafts. Low unpaired, dorsal tufts on first, third, and eighth abdominal segments. Shafts of lateral setae without black. Spiracles white. A few fine setae extend out from others at either end of body. Food: alders, birches, poplars, willows, and other hardwoods. Caterpillar: June to October; 1 generation in North.

Long-winged dagger moth
(Acronicta longa)

Generally dark above and becoming more mottled with red to venter. Dorsum of thorax and first abdominal segment with raised reddish warts, those of abdomen set with mostly stiff black setae. Pink to creamy dorsal patches on second to eighth abdominal segments; warts on these segments pale above spiracles and red below—both giving rise to mostly white setae. Red subspiracular stripe runs length of abdomen. Food: alders, birches, cherries, oaks, and others. Caterpillar: May to October; 1 generation in North.

Impressed dagger moth
(Acronicta impressa)

Dorsum blackish above and sides either orange or black with orange spot below and anterior to each white spiracle. Raised setal warts on first and eighth abdominal segments. Dorsal tufts orange on second and third thoracic and first abdominal segments; tufts of abdomen and sides white; and dorsum of eighth abdominal segment with numerous darker setae. Long pale hairs extend from either end of body. Food: alders, birches, poplars, willows, and many other broadleaf shrubs and trees. Caterpillar: May to October; 2 or more generations in South, 1 in North.

American dagger moth
(*Acronicta americana*)

Moderately large, densely clothed in long white or yellowish setae of variable length; long, paired black lashes on first and third abdominal segments and unpaired medial lash on eighth segment. Head black. Food: maples and many other forest hardwoods. Caterpillar: June to October; 2 generations in South, 1 in North.

Yellow-haired dagger moth
(*Acronicta impleta*)

Conspicuously vested with prominent darkened tufts on dorsum of first abdominal segment, these offset on all sides by white or cinnamon tufts. Dorsum of eighth abdominal segment with elongate paired tufts bordered laterally by paler shortened pair. Lateral setae long, soft, and pale, except for few very long black setae at either end of body. Subdorsal stripe broadest at seventh abdominal segment; subspiracular stripe red. Spiracles white. Food: oaks and many other forest trees. Caterpillar: May to October; 2 or more generations in South, 1 or 2 in North.

Harris's three-spot
(*Harrisimemna trisignata*)

Outstandingly distinct both in form and behavior. Shiny black with streaky white abdominal saddle, thus resembling fresh bird dropping. Thoracic setae long, directed forward about head. Dorsum of eighth abdominal segment grossly enlarged. Shed head capsules may accumulate over body. Rapidly rocking from side to side when disturbed. Food: broadleaf trees and shrubs. Caterpillar: June to October; 2 generations in North.

Tufted white pine caterpillar
(*Panthea pallescens* = *P. furcilla*)
[eastern panthea]

Red, brown, or black, patterning variable. Hairy caterpillar distinctively beset with black (sometimes white) lashes on first 2 thoracic, as well as first and eighth abdominal segments. Longer setae in lashes broadening to tips. Other setae in white, rusty, or black tufts borne on low warts. Whitish abdominal spiracles often in charcoal patches bordered below by broad, oblique creamy spots that may form wavy subspiracular band. **Black zigzag** (*P. acronyctoides*) with more white, lacking long pencils on thorax, and without apically broadened setae; firs, hemlocks, and other conifers. Food: pines, larches, and spruces. Caterpillar: May to October; 2 generations in North.

The laugher
(*Charadra deridens*)

Body pale or black with distinctive vesture of long, silky white setae. Head black with yellow band between eyes (usually) or white with darkened band across the front. Rests in silken nest fashioned between 2 or more leaves. Food: beeches, birches, elms, oaks, and other broadleaf trees. Caterpillar: June to October; 2 or more generations in South, 1 or 2 in North.

Yellow-marked caterpillar
(*Raphia frater*) [the brother]

Stocky, bright green with 3 narrow yellow dorsal saddles on first, fifth, and eighth abdominal segments—these sometimes edged anteriorly with red and black spots. Dorsum of second thoracic segment with closely set red tubercles. Handsomely dappled with yellow spots; red spotting may surround spiracles. **Abrupt brother** (*R. abrupta*), co-occurs with *R. frater* but tends to be far less common. Food: especially poplars but also alders, birches, and willows. Caterpillar: June to September; apparently 1 generation.

Grapevine epimenis
(*Psychomorpha epimenis*)

Lacking much orange thoracic and abdominal banding of related agaristine noctuids—orange color most pronounced on head, thoracic shield, and eighth abdominal segment. Usually 4 black bands per segment. Diffuse orange patch above prolegs with circular black spot. Caterpillar feeds from within shelter fashioned by drawing up edges of leaf. Food: grapes. Caterpillar: late April to June; 1 generation.

Eight-spotted forester
(*Alypia octomaculata*)

Distinguished from other common eastern agaristine noctuids by its long white setae. Thoracic shield orange with black spotting; orange banding absent from second and third thoracic segments. Black addorsal setal bases raised on first, second, and eighth abdominal segments. Seven or 8 black rings per segment, although ring that runs through orange band often incomplete. Conspicuous creamy lateral patch extends across seventh abdominal segment and on to eighth. Other closely related *Alypia* species found in Florida and across the northern United States. Food: grapes and Virginia creeper. Caterpillar: May to September; 2 generations in South, 1 in North.

Pearly wood-nymph
(*Eudryas unio*)

Thoracic shield pale with black spotting. Six or 7 black rings per segment of more or less uniform width. Setal lengths scarcely longer than blackened setal bases from which they arise. Midabdominal orange bands often cut off from orange of prolegs by black shading. Orange patch on prolegs with 2 distinct black spots. Caterpillar of **beautiful wood-nymph** (*E. grata*) larger, with orange on shield, and 1 black spot on each proleg; grape family, buttonbush, and hops. Food: grape family, evening primrose, and willow-herb. Caterpillar: June to September; 2 generations in South, 1 in North.

Confused meganola
(*Meganola minuscula*)

Light brown, mottled, with tufts of setae borne on wartlike protuberances. Dorsum with middorsal dark stripe. Thoracic shield dark laterally, usually with white spot along back margin. Dorsum of second and third thoracic, and third, seventh, and eighth abdominal segments often darkened, contrasting with hoary adjacent segments. Lateral setal tufts with 1 very long black hair. There are no prolegs on third abdominal segment in *Meganola* and related (noliine) noctuids. Food: oaks. Caterpillar: May to September; at least 2 generations.

Variegated midget
(*Elaphria versicolor*)

Highly variable, brown or black with irregular, pale dorsal saddle and humped eighth abdominal segment. Third thoracic segment somewhat swollen forming hump; first and eighth abdominal segments also humped. Head brown with curving black band to either side, or entirely black. Dorsal saddle confined to abdomen, reaching almost to spiracle on fourth segment. Black spiracular stripe on abdomen broadening to rear. Eighth abdominal segment with whitish spot above spiracle. Food: evidently grazing algal layers off of tree bark. Caterpillar: June to October; 2 or more generations in South, 1 in North.

Copper underwing
(*Amphipyra pyramidoides*)

Handsome, sea green, with numerous creamy yellow spots and humped eighth abdominal segment. Yellow and white spiracular line extending length of body, often interrupted on third thoracic and first abdominal segments. Food: general feeder on trees and shrubs. Caterpillar: May to June; 1 generation.

Olive angle shades
(*Phlogophora iris*)

Chunky, green to pink cutworm. Prothoracic shield pale without line. Dorsum often with thin interrupted middorsal line and vague markings that form chevrons over abdomen. Ill-defined spiracular stripe that tends to weaken anteriorly. Spiracles relatively large. Similar to sloping sallow. Food: generally low growing plants but occasionally shrubs and trees. Caterpillar: May to June; 1 generation.

Sloping sallow
(*Epiglaea decliva*)

Brown with vague tan, pinkish, and black mottling, and swollen rounded rump. Head shiny reddish brown, darkened to either side of midline. Thoracic shield with thin middorsal stripe and often vague subdorsal stripes. Back of first thoracic and first 8 abdominal segments often with pale, elongate, middorsal spot which may be broken into 2 parts. Diffuse pale stripe running just above spiracles. May be confused with **angle shades** (*Phlogophora* species). Food: cherries and oaks and perhaps other trees. Caterpillar: May to June; 1 generation.

Silky sallow
(*Chaetoglaea sericea*)

Pink, red, or orange-brown with indistinct reticulate mottling and pale setal bases. Head shiny reddish brown with snowflake spotting. Shield on first thoracic segment with vague dorsal and subdorsal stripes. Broad white spiracular stripe running under first and last spiracles to anal proleg; lower edge less defined. Venter rather unpigmented with greenish or pinkish tint. Similar to other sallows not depicted in this guide. Food: oaks; can be reared on cherries. Caterpillar: April to June; 1 generation.

Red-winged sallow
(*Xystopeplus rufago*)

Reddish to maroon brown with shiny black thoracic plate with conspicuous yellow subdorsal stripes. Dorsal and subdorsal lines thin, broken. Setal bases pale; fainter spotting over rest of body. Light brown spiracular stripe running below first thoracic and last abdominal spiracles. Rump bearing dark shiny plate. Food: cherries, oaks, and willows. Caterpillar: April to June; 1 generation.

Fawn sallow
(*Copipanolis styracis*)

Red or green-brown to nearly black, splattered with irregular pale spots. Head deep chestnut or red brown, darkened to either side of triangle. Shield on first thoracic segment shiny black, often with transverse yellowish line. Ground color lightened between segments. Rump with shiny dark plate. Food: oaks. Caterpillar: March to June; 1 generation.

Fringe-tree sallow
(*Adita chionanthi*)

Characteristically striped caterpillar with somewhat humped eighth abdominal segment. Head rough textured; lateral striping continued onto head. Middorsal line broad, lightened over thorax, broken into spots on anterior of abdomen, and then whitened on seventh and eighth segments. Abdomen usually with black subdorsal stripe, ending on seventh segment. Brown spiracular stripe edged with whitened stripe to either side. Food: ashes, feverwort, and fringe-tree. Caterpillar: May to June; 1 generation.

Green fruitworm
(*Lithophane antennata*)

Green with continuous yellowish dorsal, broken subdorsal and supraspiracular, and broad spiracular stripes. Setae arise from whitish spots; each segment with 2 white dots to either side of middorsal stripe (green fruitworms in *Orthosia* and related genera have 1 or no clearly defined dorsal spots). Head green, shiny with creamy upper lip. One of many species referred to as "green fruitworm." Food: cherries, oaks, and probably other trees and shrubs. Caterpillar: May and June; 1 generation.

Nameless pinion
(*Lithophane innominata*)

Brown or gray with herringbone pattern along dorsum and indistinct brownish middorsal and subdorsal stripes. Head brownish with mottling especially dense to either side of triangle. First thoracic segment with shield dark above and tan to either side. Spiracular stripe pale to brown, edged with dark above. Setal bases white. ***L. bethunei***, ***L. hemina***, and other pinions have similar caterpillars—rearing to adult should be attempted to confirm identifications. Food: many deciduous trees and shrubs, conifers, and even other caterpillars. Caterpillar: April to June; 1 generation.

Shivering pinion
(*Lithophane querquera*)

Handsome caterpillar with waxy body and bright yellow bands and patches. Head, thoracic shield, and rear abdominal segments unpigmented; stemmata undifferentiated. Dorsal yellow patches across both anterior and posterior of second and third thoracic segments; on abdomen only posterior patches present. Broad yellow spiracular stripe dodging around pale spiracular areas. Subventer unpigmented. Food: many deciduous trees and shrubs, as well as other caterpillars. Caterpillar: April to June; 1 generation.

Mustard sallow
(*Pyreferra ?hesperidago*)

Waxy white with broad lemon yellow banding. Head very pale with slightly differentiated snowflakelike spots; some stemmata black. First thoracic segment without yellow. Above level of spiracles: front two-thirds of each segment yellowed back to seventh abdominal segment; uniformly yellow from spiracles to above prolegs. Setae fine, inconspicuous. Caterpillar figured here may be that of the closely related **pale mustard sallow,** *(P. citromba).* Food: witchhazels. Caterpillar: May to June; 1 generation.

Jocose sallow
(*Feralia jocosa*)

Deep green, stunningly marked with red, white, and yellow. Head pale green, unmarked. White dorsal stripe continuous; subdorsal and spiracular stripes broken into oval spots; spiracular stripe divided into red-black, red, and white portions, more convex below. Subventral stripe broken, of yellowish spots. Two other *Feralia* co-occur over much of range with similar patterning. Food: firs, hemlocks, pines, spruces, and other conifers. Caterpillar: May to July; 1 generation.

Mottled gray cutworm
(*Abagrotis alternata*) [greater red dart]

Brown and tan checkered body with faint dorsal stripe and pale subdorsal and spiracular stripes; spiracular stripe dodging below spiracles and edged with dark brown above. Head brown with black netlike mottling and 2 solid black bands to either side of midline. Dorsum somewhat checkered with alternating dark and pale patches. Food: oaks, cherries, hickories, and other forest trees. Caterpillar: May to June; 1 generation.

Speckled green fruitworm
(*Orthosia hibisci*)

Glaucous to (rarely) blackish green with creamy stripes and spots. Eighth abdominal segment slightly swollen and humped as in other *Orthosia* species. Middorsal stripe continuous, subdorsal interrupted. Spiracular stripe somewhat thickened, passing below first and last, but above all other spiracles. Head evenly green, or less commonly, with some reticulation. Food: many shrubs and trees, including softwoods. Caterpillar: May to June; 1 generation.

Subdued quaker
(*Orthosia revicta*)

Red- to purple-brown with thin, interrupted middorsal, subdorsal, and supraspiracular stripes that may be obscure in some individuals. Head orange-brown and mottled; patterning absent along sides where band would be continued onto head. Spiracles on first and last segment along edge of broad creamy spiracular stripe, others positioned within stripe. Food: many forest shrubs and trees. Caterpillar: May to June; 1 generation.

Ruby quaker
(*Orthosia rubescens*)

Dark brown to violet gray above and pale green-white below, with broad white stripe running through spiracles. Head brown with snowflake-like lighter areas and dark stripes to either side of midline. Dorsal and subdorsal stripes broken into white spots; dorsum often with single white spot to either side of midline. Lateral stripe interrupted by dark patches about spiracles. Food: many hardwoods and softwoods, even cattails. Caterpillar: May to June; 1 generation.

Intractable quaker
(*Himella intractata*)

Pale green with 3 or 4 (usually) wavy yellowish stripes running down each side of body. Head sea green, shiny. Dorsum darker green with interrupted middorsal stripe with single white spot to either side. Subdorsal stripe broad, white, sometimes fusing with and obscuring uppermost lateral pinstripe. Spiracles yellowish. Food: many broadleaf trees and shrubs. Caterpillar: May to July; 1 generation in North.

Distinct quaker
(*Achatia distincta*)

Green with thin white or yellow stripes and numerous minute white spots. Head sea green, shiny. Middorsal stripe thin, with white spot to either side; subdorsal thickened, white; supraspiracular very faint and broken; and spiracular and subspiracular thin, creamy. Food: many broadleaf trees and shrubs. Caterpillar: April to June; 1 generation.

Confused woodgrain
(*Morrisonia confusa*)

Whitish, vinaceous, or yellowish green spangled with small white spots; sides with prominent maroon to brown spot above each spiracle; as shown here. Last instar more green-brown with less conspicuous spotting. Head shiny orange-brown. Middorsal line thin, white; subdorsal, spiracular and subspiracular lines somewhat thicker, wavy. Paler green beneath subspiracular stripe. Resting within leaf shelter by day. Food: many broadleaf trees and shrubs. Caterpillar: May to July; 1 generation.

Girlfriend underwing
(*Catocala amica*)

The underwing genus *Catocala* includes more than 60 eastern species. Their caterpillars possess elongate bodies, reduced prolegs on third abdominal segment, a subventral fringe of short thickened hairs (setae), and dark spots along venter. Girlfriend underwing gray, vaguely striped with pronounced orange warts on eighth abdominal segment. Top of head often with white and orange spot to each side. Setal bases black on dorsum of thorax; black and orange over abdomen. Fifth abdominal segment slightly humped, often followed by darkened saddle. Fringe hairs sparse, relatively long. Girlfriend underwing part of sibling species complex, the taxonomy of which is presently being studied. Food: especially white oaks. Caterpillar: May to June; 1 generation.

Connubial underwing
(*Catocala connubialis*)

Gray with dense charcoal spotting; striping faint if present. Head densely mottled in black with 2 white patches to either side of midline. Fifth and eighth abdominal segments slightly humped; dorsal setal bases orange and raised; first and fifth abdominal segments with pale subdorsal areas; dorsum of fifth segment darkened behind; eighth abdominal segment with oblique black line from spiracle to hump. Fringe moderately long and often tinted with pink. Food: oaks. Caterpillar: May to June; 1 generation.

Little nymph
(*Catocala micronympha*)

Heavily mottled in grays and white, body thickening to fifth abdominal segment; usually with dark saddle between fifth and sixth abdominal segments. Head often with orange spot to either side of midline; thin black band from antenna over top of head. Dorsal stripe whitish, more defined rearward, often including diamondlike spots. Setal bases orange over dorsum. Neither fifth nor eighth segment bear prominent warts. Fringe short and whitish. Food: oaks. Caterpillar: May to June; 1 generation.

Andromeda underwing
(*Catocala andromedae*)

Tan, brown, or gray, conspicuously striped; dorsum of fifth abdominal segment with prominent transverse hump, sometimes followed by dark saddle. Head streaked with white and brown lines; 2 well-defined brown lines to each side; top of head often with orange patches. Dorsal stripe irregular often including diamondlike spots; dorsal setae from minute orangish warts, these but slightly enlarged on abdominal segment 8. Anal proleg with thin black lateral line. Fringe short and full. In East, 2 other underwings eat blueberry: in **sordid underwing** (*C. sordida*), fringe nearly absent and in **graceful underwing** (*C. gracilis*) fifth abdominal segment only weakly humped and head less striped. Food: blueberries and andromeda. Caterpillar: May to June; 1 generation.

Sweetheart underwing
(*Catocala ultronia*)

Handsome gray caterpillar sporting prominent horn on dorsum of fifth abdominal segment. Head with sharp black line over top. Dorsal setal bases raised, red-orange, those on eighth abdominal segment enlarged with oblique black line beneath. Fringe dense and comparatively long. Food: apples, cherries, and related plants. Caterpillar: May to June; 1 generation.

Ilia underwing
(*Catocala ilia*)

Large, mottled, highly variable in coloration, ranging from mostly black to green; venter rendered in rose and pink. Back of head with broad black stripe extending over top, offsetting pale areas across front of head capsule. Fifth abdominal segment only slightly humped. Abdominal segments with dorsal setae on raised orangish warts; those of eighth segment decidedly higher. Fringe short and stubby. Food: oaks. Caterpillar: May to June; 1 generation.

Lunate zale
(*Zale lunata*)

All zale caterpillars have elongate bodies, reduced anterior prolegs and darkened ventral spots; they lack subventral fringe present on most underwings. Lunate zale gray or brown heavily marked with black. Head mottled, often black above, and commonly with inverted white V to either side of midline. Dorsal area between first and second abdominal segments commonly yellowed. Spiracular stripe black, undulating, pronounced on abdominal seventh through ninth segments. Food: cherries, maples, oaks, willows, and many other forest trees. Caterpillar: May to November; 1 generation with partial second.

Colorful zale
(*Zale minerea*)

Highly variable, similar to lunate zale but coloration more subdued (adults are colorful) and less contrasting. Mottling on head coalesced to form irregular lines, and commonly with white spot to either side of midline; labrum deeply cleft. Vague irregular stripes running length of body. Dorsal area of first abdominal segment often with dark saddle; dorsal area between first and second abdominal segments without or only modest yellow. Commonly with whitish patch above and behind second proleg. Food: many forest hardwoods, possibly spruce and other softwoods. Caterpillar: May to October; 1 generation with partial second.

Oblique zale
(*Zale obliqua*)

Coloration variable, with broad alternating dark and pale stripes. Head brownish with 2 thin black lines extending back from antenna, but without line from eyes to vertex; labrum shallowly notched. Dark subdorsal and spiracular stripes bounded by lighter coloration. Low paired dorsal warts on eighth abdominal segment; those on ninth minute. Spiracles brown or black. Caterpillar of **gray-banded zale** (*Z. squamularis*) closely similar; several additional zales co-occur with oblique zale on pine that are not distinguished in this guide. Food: red, jack, and pitch pines. Caterpillar: July to August; 1 generation.

Maple looper moth
(*Parallelia bistriaris*)

Reddish gray with numerous fine wavy black lines; first 2 pairs of prolegs reduced. Head light, mottled, often with 2 thin dark lines extending back from antenna. Abdominal venter pale with purple spots between legs and purplish line on seventh, eighth, and ninth segments. Food: especially maples. Caterpillar: June to November; 2 or more generations in South, 2 in North.

Common oak moth
(*Phoberia atomaris*)

Highly variable: brown mottled with tan, black, and white; dorsum checkered with diamonds and oblique lines. Head sometimes with whitish spot to either side of midline. Spiracular stripe darkens toward back of body, often enclosing small white spots above the spiracle on first 7 abdominal segments. First pair of prolegs half-sized. Venter pale, sometimes with pinkish flush and spots anterior to prolegs. Food: oaks. Caterpillar: May to June; 1 generation.

Red-lined panopoda
(*Panopoda rufimargo*)

Rich green with oblique lateral lines and spangling of blue or brown spots. Head sometimes with narrow yellow band curving around front; antennae red to orange. Midabdominal prolegs red to orange, flared at ends. **Brown panopoda** (*P. carneicosta*) reported to be somewhat darker, and with more conspicuous yellow band across front of head. Food: beeches and oaks. Caterpillar: July to September; 1 or 2 generations.

Baltimore bomolocha
(*Bomolocha baltimoralis*)

Bright green, elongate and somewhat flattened dorsally with reduced prolegs on third abdominal segment. Head green, occasionally with setal bases darkened. Setal bases orange, red, or black. Setae on eighth and ninth abdominal segments twice length of those midabdominal segments. Rear of each segment yellowed. Anal prolegs splayed out in V. Food: maples. Caterpillar: June to November; 2 or more generations in South, 2 in North.

Red-footed bomolocha
(*Lomanaltes eductalis*)

Bright yellow-green, elongate and somewhat flattened above with reduced prolegs on third abdominal segment. Head with numerous black spots; labrum creamy. Setae dark, from small reddish setal bases. Distal half of prolegs tinted with pink-red. Anal prolegs splayed out in V. Food: alders and basswoods. Caterpillar: June to November; 2 or more generations in South, 2 in North.

Pale baileya
(*Baileya dormitans*)

Bright green, elongate and somewhat flattened with prominent yellowish subdorsal stripe. Resembling bomolochas with splayed anal prolegs; prolegs on third and fourth abdominal segments slightly reduced in size. Head large, green and unmarked; labrum creamy. Setae short and inconspicuous. Food: ashes, ironwoods, hickories, and walnuts. Caterpillar: June to October; 2 generations in South, 1 in North.

Glossy black idia
(*Idia lubricalis*)

Very dark with rusty peglike setae on head and body. Dorsum of abdomen with 2 pairs of raised knobs on each segment: front pair black, closer to midline, with peglike setae directed forward; back pair rusty orange, with peglike setae directed backward. Prolegs on abdominal segment 3 strongly reduced. Food: lichens, grasses, rotten wood, and other organic matter. Caterpillar: overwinters, September to May; 1 generation.

Early zanclognatha
(*Polypogon cruralis*)

Yellowish tan or brown with pink cast, abdomen thickened, and each segment with transverse creasing. Head rough with mottling and brownish spots. Body with network of reddish patterning. There are more than 10 other eastern zanclognathas of which this species may be representative. Food: dead leaves, lichens, and other organic matter. Caterpillar: overwinters, thus nearly year-round; 2 generations in South, 1 in North.

Spruce harlequin
(*Palthis angulalis*) [dark-spotted palthis]

Small dark brown caterpillar with arched eighth abdominal segment. Anterior abdominal segments with oblique pale stripes that pass through spiracles onto subdorsal areas of adjacent segment; stripe on seventh segment pronounced. **Faint-spotted palthis** (*P. asopialis*) with denser, whiter, and more toothlike projections over body surface. Food: forbs, including crops, as well as forest hardwoods and softwoods. Caterpillar: June to November; 2 or more generations in South, 1 in North.

Prominents (Family Notodontidae)

Notodontid caterpillars are among the most handsome and behaviorally interesting of the eastern forest caterpillars. Several genera are ornamented with fleshy or horny knobs, others with abundant downy setae. When provoked, many adopt defensive postures, and a few back up their displays with a squirt of acid from a "neck" gland on the lower side of the first thoracic segment. All bear secondary setae on or above the midabdominal prolegs. The anal prolegs are always modified, either being reduced in size or elongated and taillike. The crochets of 1 length are arranged in a row paralleling the body axis. Prominent caterpillars tend to stay on foliage by day. Some of the most conspicuous species are gregarious. Host associations can be helpful in identification as most species are specialized in diet. Color patterns are highly variable in some species.

Double-toothed prominent
(*Nerice bidentata*)

Doubly serrate abdominal humps distinguish this chalky green caterpillar from all others in eastern North America. Profile strikingly similar to leaf edges of food plant. Food: especially large-leafed elms. Caterpillar: June to October; 2 generations.

False-sphinx
(*Pheosia rimosa*) [black-rimmed prominent]

Highly distinctive, glossy tan, yellow, green, or lavender; eighth segment with black dorsal horn; rump with spinulose plate tinted with orange or red about its periphery; spiracles black conspicuously ringed with white. Thoracic legs red-orange. Food: willows and poplars. Caterpillar: June to October; 2 generations.

Green oak caterpillar
(*Nadata gibbosa*) [white-dotted prominent]

Stout, pale green body with enlarged head and faint subdorsal stripe, and yellow-rimmed anal plate. Mandibles (jaws) bright yellow with black tips. Food: many hardwoods including cherries and maples, but especially birches, oaks, and chestnuts. Caterpillar: June to September; 2 generations in South.

Georgian prominent
(*Hyperaeschra georgica*)

Dorsum green, sometimes chalky, with conspicuous yellow spiracular stripe running length of body. Spiracular stripe often edged with red, continued on head to mandibles. Below stripe, body bright green, many segments with elongate maroon spot. Small orange-red knob on dorsum of eighth abdominal segment. Food: oaks. Caterpillar: June to October; 2 generations.

Angulose prominent
(*Peridea angulosa*)

Pinkish or lime green, with thin white or yellow spiracular stripe, edged with pink above, from mandibles to last abdominal segment. Dorsum with indistinct stripe to either side of midline and faint, broken line of subdorsal spots. Prothoracic spiracle white, ringed with black; abdominal spiracles orange or red. Food: oaks and chestnuts, occasionally pecan. Caterpillar: June to October; 2 generations.

Red-humped oakworm
(*Symmerista canicosta*)

Attractively marked with yellow (or orange), black, and white. Head and eighth abdominal segment bright orange. Subdorsal yellow or orange stripes separated by 5 black and 4 white stripes, black stripes wider than white, thin outer white stripes often broken. Similar to **white-headed prominent** (*S. albifrons*), in which black and white dorsal stripes are more similar in width; more common in South. All *Symmerista* gregarious in early instars, then solitary in last instar. Food: many forest trees but especially oaks, beeches, and chestnuts. Caterpillar: July to September; 2 generations in South, 1 in North.

Orange-humped mapleworm
(*Symmerista leucitys*)

Similar to red-humped oakworm but with more yellow. Last instar with dorsum between yellow stripes marked with only 3 black and 2 white stripes (earlier instars of other *Symmerista* may have only 3 black stripes). Food: many forest trees but especially maples. Caterpillar: July to September; 2 generations in South, 1 in North.

Black-spotted prominent
(*Dasylophia anguina*)

Splendidly rendered in shiny lavender, orange (or red), yellow, and black; both color and pattern variable. Head orange and unmarked. Middorsal and 2 or 3 subdorsal and supraspiracular stripes, these thin, broken, and black; subdorsal stripe orange, broad; spiracular stripe lemon, broad. Eighth abdominal segment with black dorsal button. Subventer with line of raised shiny black spots just above legs. Food: lead plant, locusts, and other legumes. Caterpillar: June to October; apparently 2 generations.

Sigmoid prominent
(*Clostera albosigma*)

Coloration variable, ground color dark with broad yellow to orange stripes and abundant downy, pale hair. Head dark brown, vertex often with paler chestnut spot. Dorsum with 4 yellow to orange stripes, vague in some individuals. Medial black wart on first abdominal segment nearly twice size of wart on eighth segment. Solitary in leaf shelter by day. Food: willows and poplars. Caterpillar: June to September; 2 generations.

Poplar tentmaker
(*Clostera inclusa*) [angle-lined prominent]

Similar to sigmoid prominent, dark ground color with conspicuous yellow to orange stripes. Head uniformly black. Hairs sparser than in sigmoid prominent. First and eighth abdominal segments with medial black warts of roughly equivalent size. Gregarious in nests of folded leaves by day, through last instar. Food: willows and poplars. Caterpillar: May to September; 2 generations.

Red-marked tentmaker
(*Clostera apicalis*)

Dusky gray or brown with pale addorsal and subdorsal stripes, and abundant short white setae. Head chestnut brown with strong black mottling, often absent over vertex and posterior to eyes. Sides with 2 or 3 pale wavy stripes. Some setae borne on yellow to orange warts, these more evident over dorsum. Dorsal black tufts of other *Clostera* absent. Food: willows and poplars. Caterpillar: August to September; 1 generation in North.

Contracted datana
(*Datana contracta*)

Ground color black with white or yellow stripes, subspiracular stripe somewhat broader than 3 more dorsal stripes. Body densely vested with long, soft pale hair. Neck (prothorax) mostly black with only narrow band of orange to either side. Several species of *Datana* occur in East, all species are gregarious until last instar. When alarmed they arch body into C-shape. Food: usually oaks or chestnuts, occasionally hazelnuts and others. Caterpillar: August to September; 1 generation in North.

Walnut caterpillar
(*Datana integerrima*)

Charcoal body densely vested with white, downy hair of 2 lengths. Thin stripes variably expressed: middorsal and 2 subdorsal stripes often absent in last instar, most individuals with broken subspiracular line. Prolegs often reddened. Occasionally reported as a pest. Food: many trees and shrubs, but especially hickories and walnuts. Caterpillar: May to September; up to 3 generations in South; 1 in North.

Drexel's datana
(*Datana drexelii*)

Anterior portion of first thoracic segment ("neck") yellow behind black head; body dark with 4 conspicuous yellow stripes and numerous fine white hairlike setae. Stripes fusing to form lateral patch on last 2 abdominal segments. In **yellow-necked caterpillar** *(D. ministra)*, stripes remain separate or only weakly fused about rump; variety of trees and shrubs, commonly oaks and apples. Food: Many plants especially those in heath family. Caterpillar: August to September, 1 generation.

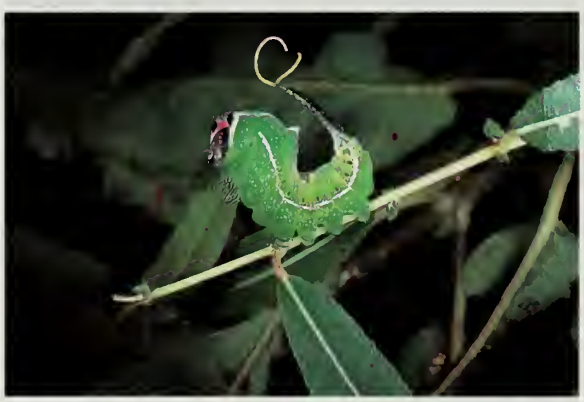
White furcula
(*Furcula borealis*)

Green or yellow-green with angulate first thoracic segment, giving appearance of ears over head. Rear of second and front of third thoracic segments form hump, but without strongly raised ridges or bumps of other furculas. Continuous brown angulate saddle ends above prolegs on fourth abdominal segment. Tails (anal prolegs) extrusible, extruded portion red or brown with paler subapical band. Food: cherries; also recorded—perhaps erroneously—from willows and poplars. Caterpillar: June to September; 2 generations.

Western furcula
(*Furcula occidentalis*)

Lime green, with continuous dorsal blue-green and brown saddle, extending downward toward second abdominal proleg. Saddle outlined with yellow. Rear of second thoracic segment with raised transverse ridge. Tails (anal prolegs) with extrusible portion brown with pale subapical band. Food: willows and poplars. Caterpillar: June to September; 2 generations.

Black-etched prominent
(*Cerura scitiscripta*)



Lime green, with white subspiracular stripe. Third thoracic segment humped, bearing white or lavender transverse ridge. Anterior of first thoracic segment reddish with dark eyespots to either side. Tails (anal prolegs) with extrusible portion yellow, tentaclelike, flailed over body when disturbed. Food: especially willows and poplars, also recorded from cherries. Caterpillar: June to September; 2 generations.

Common gluphisia
(*Gluphisia septentrionis*)

Pale green with prominent yellow subdorsal stripes; dorsum pale green or marked with wine red and yellow spots. Head flattened with conspicuous antenna, often with black lateral lines. Abdomen tapering to rear; last segment compressed. Food: poplars. Caterpillar: June to October; 2 generations.

Variable oakleaf caterpillar
(*Lochmaeus manteo*)

Body green and white often with wine red dorsal markings, sometimes entirely reddish; pattern variable. Head large with 2 conspicuous lateral bands, upper black and lower white, thicker; abdomen with thin dorsal line and broader white subdorsal stripes, edged inwardly with yellow or black. Small paired warts on dorsum of first and eighth abdominal segments. **Elm prominent** (*L. bilineata*) reported to have narrower bands on head. Food: many forest species but especially oaks. Caterpillar: June to October; 2 generations in South; 1 or 2 in North.

Maple prominent
(*Heterocampa biundata*)

Green with whitish dorsum and hourglass-shaped midabdominal saddle, pattern highly variable. Head brown to purple-black, paler medially; vertex produced into knobs. Saddle starting on last thoracic segment, widening to third abdominal segment, narrowing between fourth and fifth segments, where it may be infused with yellow, then widening again to rear. Dark lateral markings often on last thoracic and first, third, fourth, sixth, and eighth abdominal segments. Food: many forest hardwoods. Caterpillar: June to November; 1 or 2 generations.

Saddled or maple prominent
(*Heterocampa guttivitta*)

Pattern highly variable; typically bright green with pale subdorsal stripes and distinctive brown or purple V-shaped saddle atop third and fourth abdominal segments. Greenish head flattened with lateral reddish band edged outwardly with yellow and inwardly with white and black bands. Food: general feeder but especially common on sugar maple, beeches, and apples. Caterpillar: July to August; 2 generations.

Oblique heterocampa
(*Heterocampa obliqua*)

Green, tan, or brown with dorsal saddle widened at second and seventh abdominal segments. Head mottled without clearly defined stripes. Body with numerous minute red dots that form longitudinal lines over thorax and especially abdomen. Often with faint spiracular line. Food: oaks. Caterpillar: June to October; 2 generations.

White-blotched heterocampa
(*Heterocampa umbrata*)

Green, brown, or pinkish with highly variable brown and white mottling. Purple-brown head with thin black line to either side of midline. First segment of thorax with short brown and black knobs. Saddle often extends downward to touch legs on last thoracic, and second, third, and sixth abdominal segments. Food: oaks. Caterpillar: June to October; 2 generations.

Mottled prominent
(*Macrurocampa marthesia*)

Pale green flecked with purple spots; yellow dorsal stripe often edged with red; oblique yellow lines run through abdominal spiracles. Body somewhat triangular in cross section. Head large with yellow lateral band, edged inwardly with broad, irregular, red-brown band. Dorsum of first thoracic segment with 2 small reddish warts. Last segment with "tails" (these proportionately longer in earlier instars). Food: many trees and shrubs but especially oaks. Caterpillar: June to October; 2 generations.

Pink prominent
(*Hyparpax aurora*)

Blue-green to tan and speckled with pale spots; dorsum with darker green or brown abdominal saddle bordered by netlike pattern of pink and white or brown and yellow. Head with white, brown, or red mottling, which may coalesce to form irregular bands to either side of midline. First 2 thoracic segments with dorsal red-brown triangle. First abdominal segment with paired red tubercles, followed by smaller pair on eighth abdominal segment. Food: oaks and viburnums. Caterpillar: June to October; 2 generations.

Finned willow prominent
(*Notodonta scitipennis*)

Outline unique with backward projecting, fleshy humps on second and third abdominal segments; raised angulate eighth abdominal segment. Head with front flattened, slightly lobed to either side, festooned with black spots, and pale line running from antenna to vertex. Oblique lines to either side of midline on midabdominal segments. Caterpillar of ***N. simplaria*** tends to be lighter in color, often tinted with purple-gray, and mottling on eighth segment more red-orange. Food: poplars and willows. Caterpillar: July to September; 1 generation with partial second.

Red-washed prominent
(*Oligocentria semirufescens*)

Tan or brown with fleshy, apically forked horn on first abdominal segment. Smaller, yet still prominent protuberances on last thoracic, and fifth and eighth abdominal segments. Head with dark band from antenna to crown. Dorsum of sixth and seventh abdominal segments with whitish chevron. Food: many forest trees and shrubs, as well as roses and apples. Caterpillar: June to October; 2 generations.

Lacecapped caterpillar
(*Oligocentria lignicolor*) [white-streaked prominent]

Green with distinctive pattern of brown and white mottling. Head with lacelike patterning. Thorax lime green except for narrow dorsal triangle of brown. Anterior abdominal segments with brown saddle extending down to prolegs; white lateral patch around spiracle on seventh abdominal segment; forward projecting horn on first abdominal; and humped eighth abdominal segment. Similar *Schizura* species bear chevronlike marks over sixth and seventh abdominal segments and have differently patterned head capsules. Food: many forest trees and shrubs. Caterpillar: June to October; 2 generations.

Red-humped caterpillar
(*Schizura concinna*)

Strikingly colored with alternating rows of black, white, and yellow wavy stripes. Head and first abdominal segment bright red. Dorsum of thorax and especially anterior abdominal segments with elongate black pegs, each with single apical seta. First abdominal segment humped. Gregarious. Food: many deciduous trees and shrubs including blueberries, hickories, maples, oaks, willows, and poplars; often a pest on apples. Caterpillar: May to September; 2 generations in South.

Black-blotched prominent
(*Schizura leptinoides*)

Brown with prominent humps on first, fifth, and eighth abdominal segments. Head strongly mottled with pattern coalescing into broad diffuse band to either side of midline. Dorsum of thorax with dark patch widening toward head; dorsum of sixth and seventh segments with pale chevron. Food: many shrubs and trees, including oaks, birches, and hickories. Caterpillar: May to October; 1 or 2 generations.

Morning glory prominent
(*Schizura ipomoeae*)

Handsomely patterned with tans and browns and contrasting lime green second and third thoracic segments. Head with thin black stripes enclosing grayish band. First abdominal segment hornlike. Fifth abdominal segment humped. In closely related unicorn caterpillar, head bears single broader black band to either side and fifth segment not as noticeably humped. Food: many shrubs and trees. Caterpillar: May to October; 1 generation in North.

Unicorn caterpillar
(*Schizura unicornis*)

Similar to morning glory prominent, but head bears broader unpaired black band from antenna to vertex and fifth segment not as decidedly humped. Like morning glory prominent, second and third thoracic segments bright green with paired hornlike protuberances on first and eighth abdominal segments. Common name attributable to fleshy horn that arises from dorsum of first abdominal segment. Food: many broadleaf trees and shrubs. Caterpillar: May to October; 1 generation in North.

Tussock Moths (Family Lymantriidae)

Tussock moth caterpillars are often attractively beset with tufts and lashes of red, yellow, and black. As in other caterpillars, such colors warn of danger. Many people are allergic to the body hair of tussock moth caterpillars, especially if the hairs are brought into contact with eyes or sensitive areas of skin. All have an unpaired eversible middorsal (defensive) gland on the sixth and, usually, also the seventh abdominal segments, which may be brightly colored. The crochets of a single length are arranged in a single series parallel to the body axis. The caterpillars are notably catholic in diet, consuming the foliage of a wide array of shrubs and trees.

Definite-marked tussock moth
(*Orgyia definita*)

Bright yellow with paired anterior and unpaired posterior lashes composed of long black, spatulate setae. Head, thoracic shield, and dorsal glands pale. Middorsum of first through fourth abdominal segments with dense medial tuft of white, brown, or yellow setae. Food: many shrubs and trees. Caterpillar: March to November; 2 generations in Deep South; 1 in North.

White-marked tussock moth
(*Orgyia leucostigma*)

Brightly colored with black, yellow, and red. Head, thoracic shield, and dorsal glands usually red. Dorsum of abdomen black with whitish tussocks on first through fourth abdominal segments. **Rusty tussock moth** (*O. antiqua*) more gray to brown and red-orange thoracic shield with darkened, middorsal triangle. Food: many hardwoods and conifers. Caterpillar: May to October in North, all months in Deep South; 2 or more generations in South; 2 in North.

Yellow-based tussock moth
(*Dasychira basiflava*)

Coloration highly variable ranging from yellow to very dark; prominent paired black front and rear "lashes." Middorsum on first 4 abdominal segments with brown tufts, often with intermixed pale setae; dorsal tuft on eighth segment nearly black. Lateral tussock below abdominal spiracles with 1 to few long, slender dark hairs. Dorsal defensive glands yellow or white. In some parts of range, closely similar to variable tussock moth and others in genus *Dasychira*. Food: especially oaks and hickories. Caterpillar: September to June, *Dasychira* overwinter as partially grown caterpillars; 1 generation.

Streaked tussock moth
(*Dasychira obliquata*)

Coloration regionally variable, often yellow to gray brown with posterior pair of black "lashes" sparse or absent. No whitish setae. Middorsum of first and eighth abdominal segments with enlarged black tufts; those on second, third, and fourth abdominal segments weakly differentiated. Food: especially oaks but also many other forest trees and shrubs. Caterpillar: September to June; 1 generation.

Variable tussock moth
(*Dasychira vagans*)

Coloration highly variable ranging from almost white to dark gray; lateral tussocks often composed almost entirely of white setae. Very similar to yellow-based tussock moth but differing in that lateral tussocks below abdominal spiracles bear 1 to few long, club-shaped dark hairs. Dorsal defensive glands reddish. Food: especially willows and poplars, but also oaks, birches, and other forest trees. Caterpillar: September to June; 1 generation.

Gypsy moth
(*Lymantria dispar*)

First instar: brownish with dark setal tufts; first thoracic segment with prominent subdorsal warts bearing numerous long setae that makes face look "eared." Early instars "balloon" on threads of silk up to several hundred feet from egg mass.

Middle and late instars: dorsum of thoracic and first and second abdominal segments with paired blue knobs; dorsum of third to eighth abdominal segments with paired reddish knobs. Head tan with characteristic black mottling. Colors and mottling becoming more pronounced in successive instars. Later instars move down trunk and shelter along bole by day, then at dusk move back to feed in canopy. Hairs allergenic, especially if brought into contact with eyes or sensitive skin; hypersensitive individuals may react to single hairs and scales from adults. Food: early instars often on understory shrubs and trees, later moving into canopy. Recorded from more than 500 shrub and tree species. Asiatic races readily consume conifers unlike well-established European race. Caterpillar: May to July; 1 generation.

Thyatirid Moths (Family Thyatiridae)

Although the caterpillars of thyatirids superficially resemble those of owlet moths, they are in fact quite closely related to the hooktips. This small family includes but 3 common eastern species. The midabdominal segments bear 12 setae above the proleg, whereas those of many similar-appearing caterpillars have 11 or fewer setae. The head is wider than high and the labrum deeply cleft. Anal prolegs tend to be smaller then those of the mid-abdomen. Crochets of 2 lengths are set in an arching series; a smaller inner series is often present. Caterpillars often shelter within a loosely folded leaf.

Dogwood thyatirid
(Euthyatira pudens)

Elongate, thoracic segments somewhat swollen, and tapered abdomen. Head with 4 large black spots. Body uniformly pale green or with dorsum smoky green down to level of spiracles; caudal portion of each segment decidedly pale. Venter cream. Food: usually dogwoods, occasionally oaks and other plants. Caterpillar: May and June; 1 generation.

Lettered habrosyne
(Habrosyne scripta)

Cutwormlike, orange to rusty brown, with fine black dorsal midline. Head with reticulate patterning. Second thoracic segment raised. Eighth abdominal segment also humped. Abdomen with faint subdorsal chevrons; venter and lateral areas above prolegs pale. Resting with head against abdomen. **Glorious habrosyne** *(H. gloriosa)* similar but often much less common. Food: blackberry and other plants in rose family. Caterpillar: July to October, 2 generations.

Hooktip Moths (Family Drepanidae)

Hooktips comprise a small family with caterpillars distinguished by the absence of crochet-bearing anal prolegs. Most species bear a stiff, spinulose medial projection from the anal plate. The body surface is beset with numerous microscopic hairs; longer, more typical setae are usually present, especially just above legs. The upper part of head is lobed or horned. Crochets are grouped in 2 series: the outer set of 1 length, and few in number; the inner set larger and of 1 or 2 lengths. The caterpillars of eastern hooktips are specialists on birches, alders, dogwoods, and viburnums.

Masked birch caterpillar
(*Drepana arcuata*) [arched hooktip]

Color variable, somewhat quadrate in cross section with greenish thoracic dorsum giving way to reddish and brownish colors over abdomen; sides green. Setal warts enlarged on dorsum of second and third thoracic segments. Head yellowish, distinctively marked with 2 brown transverse rings. **Warty birch caterpillar** (*D. bilineata*) with more pronounced warting; head mottled with browns but lacking defined rings; birches, alders, and aspens. Food: birches and alders. Caterpillar: June to October; 2 generations.

Rose hooktip
(*Oreta rosea*)

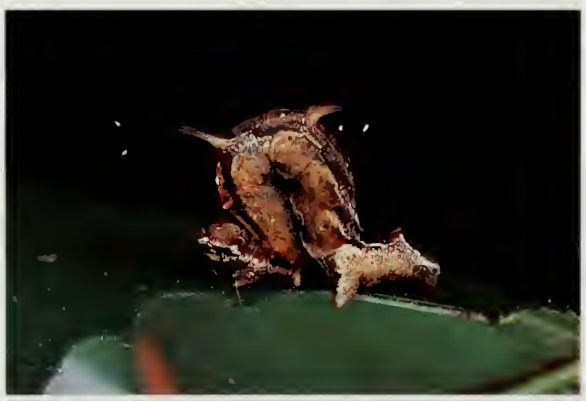
Unique caterpillar with horned head, arched third thoracic segment, and attenuated "tail." Orange- to chocolate-brown body vested with minute spinules, with vague saddle over dorsum, which narrows over fourth abdominal segment. Head with prominent thorny projection to either side. Anal plate very elongate and spined, held tail-like behind body. Food: viburnums. Caterpillar: July to October, 2 generations.

Loopers, Inchworms, and Spanworms (Family Geometridae)

Loopers, inchworms, and spanworms make up the second largest family of Lepidoptera in eastern forests. The Geometridae includes many familiar species, a number of which are important pests. As a rule, loopers are superb at matching their background—mimicking foliage, sticks, petioles, and other plant parts. Their disguise may even include plant litter affixed to the body. With but a couple of exceptions, all can be readily recognized by the possession of only a single pair of midabdominal prolegs (on the sixth segment). Being so endowed, they tend to loop rather than crawl, hence their name. Many of the twig mimics have fleshy spurs to either side (paraprocts) and or ventral to the anus (hypoproct). Crochets are usually of 2 lengths. Descriptions in this guide are based on last instars; warts and other swellings tend be less developed in earlier instars. Coloration is highly variable within species and should be used cautiously in identification. Most forest loopers are broadly polyphagous on shrubs and trees, many accept both hardwoods and softwoods.

Horned spanworm
(*Nematocampa resistaria*)

Unmistakable, with 2 sets of dorsal white-tipped extensible tentacles on second and third abdominal segments. Body variegated with browns and paler markings, occasionally with pink or purple tinting. Raised warts on dorsum of first and eighth abdominal segments. **Baggett's horned spanworm** (*N. baggettaria*) occurs along Gulf Coast; its early stages are unknown. Food: many softwoods and hardwoods. Caterpillar: July to October; 2 generations in North.



Kent's geometer
(*Selenia kentaria*)

Remarkable brown or gray stick mimic with characteristically thickened abdomen. Head flattened with white and black streaks that may continue onto thorax. First 2 pairs of legs appressed; third pair often held away. Fourth to eighth abdominal segments greatly thickened; dorsum and sides of fourth and fifth segments raised. Ventral margin between abdominal and anal prolegs with sparse fringe of light setae. Food: maples, oaks, poplars, and other forest trees. Caterpillar: June to October; 1 or 2 generations.

Oak beauty
(*Nacophora quernaria*)

Large, thickened robust caterpillar mottled with browns and grays. Head flat, sloping inward, vertex cleft. Each spot on head made up of 10 to 20 speckles. Thorax swollen and humped, darkened above. Dorsal paired raised warts on second and eighth abdominal segments and ventral warts on third. Subventral fringe of thickened setae between abdominal and anal prolegs. Food: many forest trees. Caterpillar: June to October; 2 generations in South, 1 principal generation in North.

Oak besma
(*Besma quercivoraria*)

Green, brown, or tan twig mimic with conspicuous reddish or darkened thoracic and abdominal swellings. Head reddish brown, flattened and sloping; vertex somewhat lobed to either side, lobes often bearing pale triangular area, widest behind. Second thoracic segment conspicuously swollen. Abdomen: second segment with small subspiracular and ventral warts; third bearing conspicuous lateral and dorsal swellings, and sixth with dorsal warts; subtle longitudinal wrinkle forward of spiracle. **Straw besma** (*B. endropiaria*) has warts like those of oak besma but tending to be greener; (especially on maple). Food: many forest trees including conifers. Caterpillar: May to October; 2 generations in North.

Maple spanworm
(*Ennomos magnaria*)

Superb twig mimic; green, brown, or gray dappled with minute white spotting; pronounced leaf-scarlike swellings. Head flattened and directed forward with long antennae. Legs of third thoracic segment greatly swollen at their base, commonly held out from body. Dorsum of second and fifth abdominal segments, and venter of third with raised transverse ridges. Eighth abdominal segment with low, darkly pigmented dorsal warts. Food: prefers oaks, hickories, elms, ashes, and maples, but caterpillars defoliate many hardwoods during outbreaks. Caterpillar: May to August; 1 generation.

Elm spanworm
(*Ennomos subsignaria*)

Green, brown, or black with yellow to red head, legs, and rump. Head rounded, without mottling. Abdomen with lateral wrinkling, abdominal segments with longitudinal crease below spiracle. Dorsum of abdominal segments with raised ridges (second and fifth) or warts (eighth). Food: oaks, birches, elms, and maples preferred, but caterpillars defoliate many hardwoods during outbreaks. Caterpillar: May to early July; 1 generation.

Purplish-brown looper
(*Eutrapela clemataria*) [curve-toothed geometer]

Greenish or tan to dark purple-brown with conspicuously swollen second thoracic segment, marked with orange or red. Blackened protuberances on dorsum of fourth and eighth abdominal segments. Setal bases often light orange. Spiracles small, tan to orange, rimmed with black. Food: many forest species including softwoods. Caterpillar: June to October; 2 generations.

Cleft-headed looper
(*Biston betularia*) [pepper-and-salt geometer]

Large, cylindrical, elongate green to brown caterpillar with vertex deeply cleft. Front margin of first thoracic segment with subdorsal warts. Rounded warts, subdorsally on fifth abdominal segment and dorsally on eighth, bear numerous minute black spinules. Sparser spinules over dorsum of abdominal segments. Food: many broadleaf forest trees and shrubs. Caterpillar: June to October; 1 generation with partial second.

Common gray
(*Anavitrinella pampinaria*)

Tannish stick mimic sometimes with faint middorsal and midventral stripes. Head flat-faced, subquadrate mottled with tan, white, black, and occasionally pink; often with black spots forming dark blotch to either side of triangle. Dorsum of thoracic segments with fine, closely paired black lines. Second abdominal segment modestly swollen with low yellowish-orange dorsolateral swelling that includes spiracle. Dorsum of eighth abdominal segment bears paired blackened warts. Food: many deciduous trees and shrubs, even clover, cotton, and grasses. Caterpillar: May to November; 2 generations in North.

One-spotted variant
(*Hypagyrtis unipunctata*)

Cylindrical, mottled in grays and reddish brown with faint longitudinal streaking, lacking conspicuous warts, humps, or other distinctive characters. Venter of third thoracic segment modestly thickened. Often with small pale lateral spots on first abdominal segment just above and behind spiracle. Head mottled, with markings coalescing into darker area above triangle. Dorsum of eighth segment sometimes with pale spots. Last abdominal segment with lateral anal spurs (paraprocts) little more than nubs. Three other closely similar *Hypagyrtis* occur in East. Food: many forest trees and shrubs, possibly including conifers. Caterpillar: overwinters, essentially all months; 2 generations in North.

Fervid plagodis
(*Plagodis fervidaria*)

Purple or brown gray marked with black, pale gray, and tan. Head flattened and sloping, somewhat lobed above; spots coalescing to form brown patch over lobes. Second and third thoracic segments swollen. Legs short and appressed to body. Setal bases often blackened. Dorsum enlarged on fifth abdominal segment, lower front half of swelling with indistinct transverse band. Other *Plagodis* occur in eastern United States with similar caterpillars. Food: deciduous and coniferous trees. Caterpillar: May to November; 2 generations in North.

Variable antepione
(*Antepione thisoaria*)

Gray-brown stick mimic with second thoracic segment raised into shelf; body gradually thickening to back. Prothorax with dark middorsal stripe. Anterior face of thoracic shelf blackened to either side with 4 faint lines running down to first thoracic segment. Head dorsoventrally compressed. Head mottled with vague lateral striping and raised darkened wart at top of frontal triangle. Antennae long, last segment pale at base. Legs far forward on third thoracic segment. Dorsum of fourth and fifth abdominal segments with small darkened warts. Last abdominal segment with conspicuous paraprocts and sharp, whitish hypoproct. Food: many deciduous trees and shrubs. Caterpillar: May to November; 2 generations in North.

Saddleback looper
(*Ectropis crepuscularia*) [small engrailed]

Stocky, gray to brown marked with black and pale, sometimes pinkish, areas. Dorsum of second thoracic segment slightly humped; venter and sides of third thoracic segment modestly swollen; and raised, arcing ridge on eighth abdominal dorsum. Head rounded, mottled with black, sometimes with herringbone pattern to either side of midline. Brownish middorsal line finely edged with black; faint subdorsal stripes of thin, double black lines; often with dark V on dorsum of second abdominal segment, dark subspiracular patches, and oblique pale line extending forward from proleg. Food: many forest trees and shrubs, especially conifers. Caterpillar: April to October; 2 generations in North.

Common metarranthis
(*Metarranthis hypochraria*)

Elongate, straw, orange, tan, or brown stick mimic, with venter bearing pale stripes. Front of head abruptly flattened and darkened. Subventral region of first 6 abdominal segments undulated. Raised tubercles on dorsum of eighth abdominal segment, followed by smaller set on ninth. Other setae arise from slightly raised warts. Often with small pale dorsal spots near anterior margin of second abdominal segment. Spiracles small, dark and rounded. Several other *Metarranthis* occur in East with similar caterpillars. Food: many trees and shrubs, especially cherries. Caterpillar: June to July; 1 generation.

American barred umber
(*Anagoga occiduaria*)

Cylindrical reddish brown stick mimic without pronounced swellings. Head flattened; vertex shallowly cleft and angulate; mottling occasionally forming diffuse band to either side of triangle, cheeks paler. Dorsum of first abdominal segment often with subdorsal stripes; abdominal setae on tiny warts which may be lightly colored; venter of first 2 or 3 abdominal segments with setae borne from minute warts; fifth abdominal segment with small, paired, darkened warts. Food: many shrubs and trees, including conifers. Caterpillar: May to October; 2 generations in North.

White slant-line
(*Tetracis cachexiata*)

Splendid black-brown to gray twig-mimic bedecked with barklike coloration and warting. Color highly variable. Head dorsoventrally flattened, held forward, antennae long. Second thoracic segment thickened with broad subdorsal swellings. First abdominal segment with oblique swelling in front of and below spiracle; second segment with smaller rounded wart in same position. Proleg on sixth segment often with black line that continues onto preceding segment. Dorsum of fourth and fifth abdominal segments with paired knobs; eighth abdominal segment slightly raised. Caterpillar of **yellow slant-line** (*T. crocallata*) with U-shaped mark extending upward and about vertex. Food: many deciduous trees, as well as pines and hemlocks. Caterpillar: June to November; 2 generations in North.

Northern pine looper
(*Caripeta piniata*)

Reddish brown, occasionally with faint spiracular patches or stripe; without prominent warting, but creased and with numerous low swellings especially along sides, gradually thickening to back. Head rounded, mottled with blacks, grays, and tans; antennae long. Apical portion of claws darkened. Two other *Caripeta* also occur on conifers in the East; also similar to **large purplish gray** (*Anacamptodes vellivolata*) —it has crochets in 1 group, whereas *Caripeta* has crochets arranged in 2 groups. Food: pines and spruces. Caterpillar: July to October; 1 or 2 generations.

Linden looper
(*Erannis tiliaria*)

Dorsum usually marked with 4 or 5 pairs of wavy black stripes, lemon yellow sides, and pale venter; rarely entirely yellow. Abdominal segments annulated behind black-rimmed spiracles. Head and rump light orange brown. Occasionally a pest. Food: general feeder on broadleaf trees. Caterpillar: May to July; 1 generation.

Small phigalia
(*Phigalia strigataria*)

Highly variable, most individuals bicolored, marked with browns and blacks dorsally, paler, often yellowish green laterally and ventrally; other individuals very dark, usually with some light areas below abdominal spiracles of at least first 3 abdominal segments and above midabdominal proleg. Head pale brown or orangish, usually mottled. Legs pale with darkened claws. Dorsum of second, third, and eighth abdominal segments with slightly raised darkened warts; often subtly striped down to black or white supraspiracular area. Food: oaks, elms, and other trees. Caterpillar: May to July; 1 generation.

Half-wing
(*Phigalia titea*)

Violet to gray brown with numerous fine, wavy stripes edged with black. Addorsal stripes often orange. Dorsum of first 8 abdominal segments with shiny black warts bearing prominent black setae, longer and more conspicuous than those of small phigalia. Head tan with black mottling. Spiracular areas often swollen and warted, and flushed with orange. Food: common on many hardwoods, especially apples, oaks, maples, basswoods, hickories, and elms. Caterpillar: May to July; 1 generation.

Pale metanema
(*Metanema inatomaria*)

Somewhat flattened, mottled greenish gray with indistinct markings, dorsum with pale chevron over fourth and sixth abdominal segments. Sides corrugated, often with dark subspiracular stripe. Head pale with strong mottling. Thin black addorsal lines on thorax. Venter greenish gray and unmarked. Anal plate with 4 small posterior teeth, each bearing a seta. Rests appressed to leaf or twig. Food: both deciduous and coniferous trees and shrubs. Caterpillar: May to November; 2 generations in North.

Bent-lined gray
(*Iridopsis larvaria*)

Green with dorsal brown markings over thoracic and second to fifth and eighth abdominal segments. Spiracles small, whitish, rimmed with pale orange. Venter of second abdominal segment with brown patch that may join dorsal patch; spiracular area of second segment swollen. Thoracic and midabdominal prolegs darkened. Dorsum of eighth abdominal segment with low, black warts. Head flat-faced, mottled orange brown, lobed above, with broad darkened band that meets over head and may continue onto thorax; this band narrowing to eyes, leaving pale "cheek" patch. Food: many deciduous trees. Caterpillar: May to October; 2 generations in North.

Small purplish gray
(*Anacamptodes humaria*)

Distinctively colored with red or purple-brown dorsum marked with faint striping, bounded by broad but diffuse black stripe that continues on head down to eyes. Sides green to straw. Head mottled with browns. Second abdominal segment with black spot immediately behind spiracle. Venter green. Food: many trees, shrubs, and forbs, including a number of crops. Caterpillar: May to October; 2 generations in North.

Fringed looper
(*Campaea perlata*) [pale beauty]

Reddish to gray brown with subventral fringe of short thick setae. Distinguished from other loopers by its extra pair of (reduced) prolegs on fifth abdominal segment. Head with diffuse dark band from eyes to vertex. Dorsum of eighth abdominal segment with small warts. Food: many forest trees, especially maples. Caterpillar: June to November; 2 generations in North.

Hemlock looper
(*Lambdina fiscellaria*)

Smooth, elongate, set with gray, tan, brown, white and black wavy stripes; highly variable in color. Head with indistinct mottling and prominent black spots. Dorsal setal bases and spiracles black. Small warts on dorsum of eighth abdominal segment. **Curve-lined looper moth** (*L. fervidaria*) similar but usually with distinct orange or black subdorsal stripe, body darker laterally, and black spots on head sometimes enlarged (especially on oaks). Food: oaks and other hardwoods, as well as pines, firs, and hemlocks. Caterpillar: June to October; 2 generations in South, 1 in North.

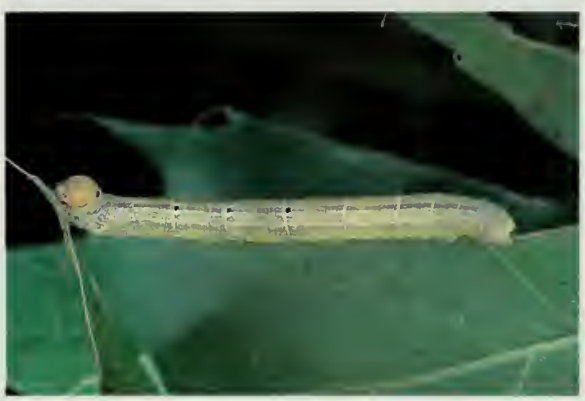
Yellow-headed looper moth
(*Lambdina pellucidaria*)

Smooth, elongate, fashioned with numerous wavy stripes; color variable but usually with black subdorsal stripe and darkened laterally; venter pale with thin pale stripes. Head grayish with darker mottling, dark spots smaller or more diffuse than those of hemlock looper. Setal bases not darkened. Dorsum of eighth abdominal segment weakly humped. Thoracic legs and sixth abdominal proleg pale orange-tan, and mostly unmarked. Food: especially pines. Caterpillar: June to October; 2 generations.

Fall cankerworm
(*Alsophila pometaria*)

Green (in low-density populations) to black (especially high-density populations). Many forms with pale subdorsal, supraspiracular, and subspiracular stripes. Dorsum often darkly colored. Abdominal segments frequently with black spot behind spiracle. Distinguished from other loopers by presence of rudimentary prolegs on fifth abdominal segment. Occasionally a pest. Food: new foliage of many hardwood species. Caterpillar: May and June; 1 generation.

Double-lined gray
(*Cleora sublunaria*)



Elongate, smooth, green to brown with faint dorsal and lateral stripes. Head with faint spotting forming short concentric bands. Dorsum with darker middorsal (heart) line edged with indistinct addorsal, subdorsal, and supraspiracular stripes. Second, third, and fourth abdominal segments with middorsal black spot, bounded with white laterally, near front margin of each segment. Often with dark lateral spot behind spiracle. Food: oaks, sweetfern, and presumably others. Caterpillar: June to July; 1 generation.

Canadian melanolophia
(*Melanolophia canadaria*)

Light green with variously developed whitish green subdorsal stripe with wispy addorsal and supraspiracular stripes to either side. Broader, spiracular line may be pink on 2 or more segments, often continued as lateral line onto head. Back of each segment flushed yellow or red. Spiracles often orange. Caterpillars of **signate melanolophia** (*M. signataria*) are closely similar. Food: many forest trees. Caterpillar: May to September; 2 generations.

Wild cherry looper
(*Lomographa semiclarata*)

Small, bright green with yellow or red markings down midline, some with continuous line and others with line of spots at back of each segment. Head green with bright red band to either side of triangle. Paler, blue-green below spiracles. Anal plate on last abdominal segment with bright red to either side. **White spring moth** (*L. vestaliata*) with chestnut patch on vertex edged with black; body with faint dorsal, subdorsal, and spiracular lines. Food: especially cherries but also alders, poplars, and others. Caterpillar: May to July; 1 generation.

White-fringed emerald
(*Nemoria mimosaria*)

Small, rusty brown or green with winglike lateral flanges on abdomen; body densely spinulose. First thoracic segment with raised many-spined warts. Lateral lobes largest on second, third, and fourth abdominal segments. Dorsum of eighth abdominal segment with 2 sharp upright protuberances. There are several species of *Nemoria* in East, identifications are best confirmed by rearing. Food: oaks, hemlocks, firs, and many other forest trees. Caterpillar: June to September; 1 generation.

Autumn juniper moth
(*Thera juniperata*)

Stunning inchworm, head deep green, held under thorax. Dorsum chalky or bluish green; yellowish subdorsal stripes. Spiracular stripe red above and white below. Legs pinkish. Food: junipers. Caterpillar: August to October; 1 generation.

Curve-lined angle
(*Semiothisa continuata*)

Green with whitish markings, closely mimicking leaves of cedar hosts. Head with pale areas to either side of deep green triangle. Inconspicuous darkened middorsal stripe, broken white subdorsal stripe, and broken greenish or yellowish white spiracular stripe. Spiracular areas of abdomen raised. Another cedar feeder, **many-lined angle** (*S. multilinea*), tends to have subdorsal stripe broken up into spots that are broadest above spiracle. Food: junipers. Caterpillar: May to November; 2 generations in North.

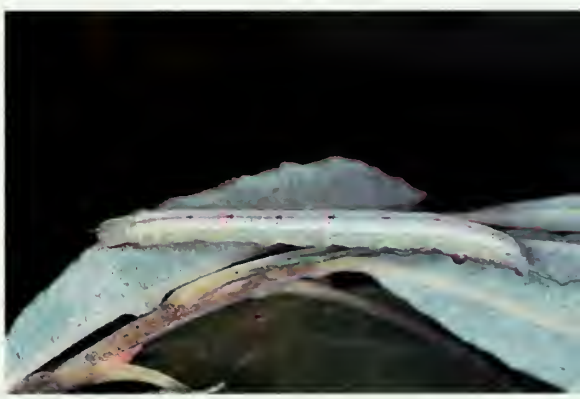
Hemlock angle
(*Semiothisa fissinotata*)

Smoky green with inconspicuous striping. Head with deep green triangle and broad black bands on both sides. Faint middorsal stripe edged with white. Subdorsal stripe white above, dark below, continued onto head; whitish spiracular stripe. Darkened line above proleg. Several other angles feed on conifers in East. Food: hemlocks. Caterpillar: June to October; 2 generations in North.

Powder moth
(*Eufidonia notataria*)

Smoky green, smooth, cylindrical with prominent creamy spiracular stripe ending at anal proleg, this stripe sometimes edged below with yellow or red. Dorsum with thin middorsal (heart), addorsal, and subdorsal stripes variously expressed. Intersegmental areas pale. Spiracles tannish orange. Food: firs, hemlocks, larches, spruces, and pines. Caterpillar: June to September; 1 generation.

Yellow-dusted cream moth
(*Cabara erythemaria*)



Yellow to waxy green, with variously developed reddish markings. Head somewhat flattened, held forward with red lateral stripes continued onto antennae and back onto thorax, intermittent on abdomen, again strong on anal proleg. Dorsum with dark dot at anterior edge of first 8 abdominal segments; these often bounded on either side by whitish patch that is edged with black and/or red. Legs often vinaceous. **Pink-striped willow spanworm** (*C. variolaria*), similar but with edging on white dorsal patches less pronounced. Food: willows and poplars. Caterpillar: May to October; 2 generations in North.

Tulip-tree beauty
(*Epimecis hortaria*)

Stocky, gray to brown, with subtle pinstriping and uniquely thickened third thoracic segment. Head with reticulate pattern of dark mottling, which carries onto body. Rusty orange spiracles often embedded in dark lateral patch. Third thoracic segment considerably swollen at leg base. Abdomen often looped upward immediately behind thorax. Anal proleg stout with vertical crease or line. Food: many forest hardwoods. Caterpillar: May to November; 1 or 2 generations.

Juniper twig inch-worm
(*Patalene olyzonaria*) [juniper geometer]

Slender brown twig mimic checkered with white, gray, and black, much like bark of its hosts. Head somewhat dorsoventrally flattened, held forward, triangle darkened, antennae whitish. No prominent warts, although posterior half of first 6 abdominal segments somewhat thickened laterally and ventrally, with transverse furrowing. Each of these same segments bears broad pale patch in front of spiracle. Anterior face of prolegs lightened. Food: junipers and cedars. Caterpillar: May to October; 2 generations in North.

Slug Caterpillars (Family Limacodidae)

Slug caterpillars are the most morphologically diverse and oddest appearing group of caterpillars in North America. Despite their highly variable body plan, slug caterpillars may be readily recognized by an examination of their venter. Instead of paired abdominal prolegs, they have medial suckers on the first 7 abdominal segments, which lack both prolegs and crochets. Their heads are often hidden from view, retracted well into the thorax. Many species have urticating spines, which in a few, can deliver a very painful sting. They are broadly polyphagous but show a preference for smooth-leafed trees and shrubs.

Monkey slug
(*Phobetron pithecium*) [hag moth]

Most distinctive caterpillar in eastern North America. Densely hairy with 3 long and 3 shorter pairs of lateral lobes armed with short urticating spines. Lobes deciduous, hence occasionally missing. Thought to mimic cast skins of tarantulas (which also bear urticating hairs). Food: many forest trees and shrubs, especially oaks and cherries. Caterpillar: July to October; 1 generation in North.

Saddleback caterpillar
(*Sibine stimulea*)

Another unique slug caterpillar. Charcoal black or brown, with unmistakable lime green abdominal saddle. Saddle with central brown patch ringed with white. Dorsum of first and eighth abdominal segments with fingerlike lobes bearing numerous stinging spines. Sting intense and of considerable duration. Food: broadly polyphagous on trees, shrubs, grasses such as corn, and other garden plants. Caterpillar: July to October; 1 generation in North.

Skiff moth
(*Prolimacodes badia*)

Shape unique with strongly humped dorsum, highest at fourth abdominal segment, smooth without stinging spines. Sides green, occasionally marked with white spots that resemble damaged or necrotic leaf tissue; dorsum highly variable from brown to green. Posterior drawn out to point. Food: cherries, oaks, and many other woody plants. Caterpillar: July to October; 1 generation in North.

Red-crossed button slug
(*Tortricidia pallida*)

Oval, flattened yellow to green with dorsal cruciate red or purple-brown brand. Body smooth, without stinging spines; dorsal setae arising from shallow depressions. Cross narrowed behind head, abruptly expanded over abdomen, nearly reaching sides of body, gradually narrowing to back end. In ***Tortricidia flexuosa,*** cross not reaching more than halfway to sides of body; in ***T. testacea*** with front and back ends of cross roughly similar in width. Food: broadly polyphagous on shrubs and trees. Caterpillar: July to October; 1 generation in North.

Purple-crested slug
(*Adoneta spinuloides*)

Pale green with purple and yellow dorsum; somewhat flattened above, sloping to tail end. Undulating purple dorsal stripe widest at second or third abdominal segment. Dorsum with 3 anterior and 1 posterior pair of enlarged orange-red warts, each armed with numerous stinging spines. Food: many forest trees and shrubs, often on oaks and cherries. Caterpillar: August to October; 1 generation in North.

Spiny oak slug
(*Euclea delphinii*)

Green (usually), orange, or red; in green forms, handsomely marked with yellows, oranges, reds, or combination of these. Body with numerous yellowish lobes each bearing 15 to 50 black-tipped stinging spines. Two pairs of longer lobes at tail end subtended by dense, triangular fascicle of blackish detachable ("caltrop") spines. **Stinging rose caterpillar** (*Parasa indetermina*) with lobes on fourth, seventh, and eighth abdominal segments proportionately much longer than those of spiny oak slug—nearly width of body. Food: many forest trees and shrubs, especially oaks. Caterpillar: August to October; 1 generation in North.

Pin-striped slug
(*Monoleuca semifascia*)

Body pink-orange, marked with black and white or yellow striping and numerous stinging setae. Dorsal and lateral areas each with set of 3 thin dark stripes. Four lobes about anterior end and 2 from posterior end. First 8 abdominal segments with subdorsal and subspiracular warts each bearing more than 20 stinging spines. Food: many forest trees and shrubs, especially oaks. Caterpillar: July to September; 1 generation in North.

Small parasa
(*Parasa chloris*)

Brown, tan, or peach, strongly humped; dorsum flattened, nearly quadrate in cross-section; posterior end produced as tail. Dorsum with 3 anterior and 2 posterior tufts of stinging spines, these largest on hump. Abdominal venter edged with pink and white. Food: birches, elms, oaks, and many other trees and shrubs. Caterpillar: August to October, 1 generation.

Crowned slug
(*Isa textula*)

Body green usually marked with red, strongly flattened, encircled with lobes bearing numerous stinging spines. More stinging hairs on small, paired lobes running down dorsum. Anterior end produced forward, edged with orange and red. Food: many forest trees and shrubs, especially oaks. Caterpillar: August to October; 1 generation in North.

Yellow-shoulder slug
(*Lithacodes fasciola*)

Green with yellow markings, surface corrugated with nonstinging setae recessed in depressions. Dorsum flattened then angled downward. Indistinct yellow subdorsal stripe most pronounced over thorax and toward back of body. Yellow spots down dorsum, about spiracles, and in 2 lines below spiracles. *Apoda* caterpillars similar but with dark shade above subdorsal stripe. Food: many forest trees and shrubs. Caterpillar: July to September; 1 generation in North.

Puss Caterpillars (Family Megalopygidae)

Puss caterpillars are often vested in long, downy setae, and like their kin the slug caterpillars, they can inflict a painful sting. Most of the caterpillar stings in the South can be attributed to flannel moth caterpillars. Once in hand, they can be distinguished from all other Lepidoptera in having 6 pairs of midabdominal prolegs, although the first and last pairs, on the second and seventh segments, lack crochets. Of the 4 eastern species, 3 have a wispy tail of hairlike setae. Puss caterpillars are broadly polyphagous on shrubs and trees.

Crinkled flannel moth
(*Lagoa crispata*)

Densely hairy, gray, orange, or tan. Somewhat squat, oval outline when viewed from above. Hairs form indistinct crest over midline, which is often lighter in color. Pale body surface visible through pile. Stinging hairs located on warts below downy, hairlike setae. Earlier instars vested with very long, swirling pale hair. **Southern flannel moth** (*Megalopyge opercularis*) with curled setal tufts to either side of tail. Caterpillar of **yellow flannel moth** (*L. pyxidifera*) similar. Food: broadly polyphagous on shrubs and trees. Caterpillar: June to November; 2 or more generations in South, 1 in North.

Swallowtails (Family Papilionidae)

Like the silkworms, swallowtail caterpillars are often brought into schools and nature centers. All possess an eversible forked structure called an osmeterium immediately behind the head on the dorsum of the first thoracic segment. When roughly handled, attacked by ants, or buzzed by a yellow jacket, the bright orange to red, sickeningly sweet smelling tentacles of the osmeterium (shown extruded in orange dog below) can be everted and flailed about. The caterpillars are broadest near the thoracic abdominal juncture; the head is held beneath the thorax. Although smooth to the touch, the body is set with minute fine hairs, especially below the spiracles. Crochets of 3 (rarely 2) lengths are arranged in a row paralleling the body axis; there may be a second smaller set of reduced crochets closer to the midline.

Orange dog
(*Papilio cresphontes*) [giant swallowtail]

Bird-dropping mimic, dark brown and white, with black marbling, sapphire blue spotting, and shiny body surface. Third thoracic segment swollen and arched, tapering to either end. White lateral collar running from top of head back along lower sides of thorax. White abdominal saddle wrapping down to first abdominal proleg. Pure white rump patch includes anal prolegs. Food: citrus, prickly ashes, and hop tree. Caterpillar: July to October; 3 or more generations in South, 1 or 2 in North.

Eastern tiger swallowtail
(*Papilio glaucus*)

Green dorsum grading to pale venter. Third thoracic segment with small yellow "eyes" with black and white pupil and black bar toward midline. Posterior edge of first abdominal segment with transverse yellow bar that is concealed in intersegmental fold at rest. Dorsum of ninth abdominal segment with low transverse ridge. **Canadian tiger swallowtail** (*P. canadensis*) has but 1 generation, occurs across northern states and southern Canada, and eats alders, birches, cherries, poplars, and willows. Food: many trees and shrubs in apple, magnolia, ash, birch, and willow families. Caterpillar: April to November; 3 or more generations in South, 2 generations in North.

Spicebush swallowtail
(*Papilio troilus*)

First 3 instars resemble bird-droppings: shiny green-brown to chocolate brown with black eyespots on thorax and variously developed white spiracular stripe that may be all but absent, or more commonly, enlarged to form a saddle that curves up over third and eighth abdominal segments. Last 2 instars snakelike, green, yellow, or yellow-orange, with large "pupiled eyes" on third thoracic segment, followed by paired yellow spots on first abdominal segment, and conspicuous blue spotting. Body yellow or reddish tan below broad yellow spiracular stripe. **Palamedes swallowtail** (*P. palamedes*) closely similar but with white spot in both pairs of eyespots smaller or absent, and more rusty or maroon beneath; caterpillars on red bay and sassafras. Food: sassafras, spicebush, magnolias, and red bay. Caterpillar: April to November; 3 generations in South, 2 in North.

Zebra swallowtail
(*Graphium marcellus*)

Hump-backed, pale green with pale blue, yellow, and black rings running over top of body. Dorsum of first abdominal segment with thickened black ring followed by yellow ring. Abdominal segments with anterior yellow ring followed by 2 to 3 pale green to white rings that end at about level of spiracles—these edged with black in some individuals. Black occasionally predominates. Head small, held beneath. Food: pawpaws. Caterpillar: May to November; 3 or more generations in South, 2 in North.

Brush-footed Butterflies (Family Nymphalidae)

Although a large family, few brush-footed butterflies feed on forest trees and shrubs. Those that do sport hard, branched, thickened spines called scoli, which challenge the gullets of their would-be predators. They tend to be large-headed, at least relative to width of the first thoracic segment. The body is covered with numerous setae especially below the level of the spiracles. The crochets—of 1, 2, or most commonly 3 lengths—are arranged in series that parallels the body axis. Coloration is highly variable, especially across different regions of the country.

Tawny emperor
(Asterocampa clyton)

Highly distinctive, head adorned with "crown of thorns," and body granulose. Spikelets on dorsal horns of head more than half length of longest spikelets along cheek. Dorsum and often sides with yellow or white stripes; middorsal stripe continuous, dark green or blue. Body often zigzagged at rest. Gregarious through third instar. In **hackberry emperor** (*A. celtis*), spikelets of dorsal horns shorter, only half length of longest along cheek, dorsal striping often inconspicuous to absent (eastern populations); and body often straight at rest. Food: hackberries. Caterpillar: July to October; 2 or more generations in South; 2 in North.

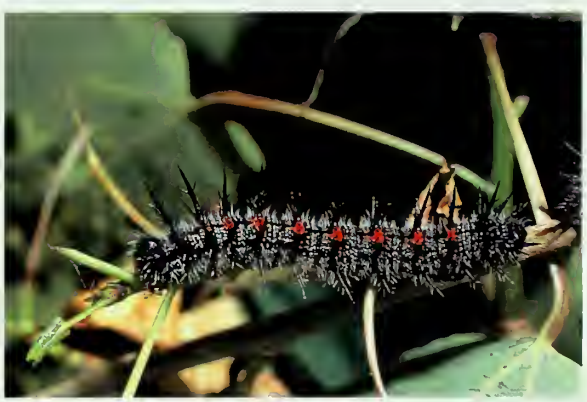
Diana fritillary
(Speyeria diana)

Large, nearly black caterpillar with numerous long branched spines over body, these bright orange at their bases. Top of head orange, lower portions black; vertex produced to either side. **Great spangled fritillary** *(S. cybele)* with orange of spine bases more subdued, projections on vertex more rounded and orange on head extending farther down "cheeks." Food: violets. Caterpillar: overwintering as first instar, maturing in May and June, 1 generation.

Red-spotted purple
(*Limenitis arthemis astyanax*)

Green or brown bird-dropping mimic with white abdominal saddle and long, black spinulose horns on second thoracic segment. Top of head with 2 small spinulose knobs. Second abdominal segment with prominent subdorsal swellings. Last thoracic segment humped; seventh and eighth abdominal segments as well but to lesser degree. **White admiral** (*L. arthemis arthemis*) dark with long thoracic horns slightly clubbed. **Viceroy** (*L. archippus*) similar but with pair of spine clusters atop thoracic and abdominal humps, conspicuous "ankle bracelets" of pale spines above each proleg, and more spinulose overall. Food: cherries, elms, oaks, poplars, willows, and others. Caterpillar: April to October; 3 or more generations in South, 2 in North.

Mourning cloak
(*Nymphalis antiopa*)



Blackish with abundant white flecking. Black dorsal midline flanked by paired red spots on last thoracic and most abdominal segments. Spines, long and shiny black with short side branches. Prolegs red. Caterpillars feed gregariously, writhing and twitching upon disturbance. Food: usually willows or elms but also hackberries and others. Caterpillar: June to September; up to 3 generations in South; 1 or 2 in North.

Comma
(*Polygonia comma*)

Extremely variable in color, from green or creamy white to black, sometimes marked with orange-red above abdominal spiracles. Oblique lines pass along base of subdorsal scoli, especially on fifth to seventh abdominal segments. Spines usually light colored with black setae at tips. Dorsal spines on second thoracic segment roughly similar in size and color to those behind. In question mark, dorsal spines on second thoracic segment tend to be more developed and darker than those that follow, especially those of abdominal segments. Head of comma with more pronounced and denser projections than that of question mark. Food: elms, hops, and nettles. Caterpillar: May to October, 3 generations in South; 2 in North.

Question mark
(*Polygonia interrogationis*)

Highly variable, ranging from blackish to red and pinkish brown, abundantly dappled with minute whitish spotting. Dorsal scoli of second thoracic segment often darker than those that follow. Undulating subspiracular stripe variously developed, occasionally broken into oblique pale lines. Faint stripe above spiracle running through scoli which are darkened relative to those above or below. Abdominal spiracles black ringed with white. Food: especially elms, hackberries, but also hops and nettles. Caterpillar: May to November; up to 4 generations in South; 2 in North.

These small, sluglike caterpillars are oval or tear-shaped and somewhat flattened, with the head often withdrawn into the thorax. Coloration may be highly variable even within a species; many have chevron markings over the dorsum. Short dense hairs give the surface a velvety texture. The crochets are of 2 or 3 lengths in a linear series that is often interrupted in the middle by a fleshy lobe—adjacent to lobe, the crochets are often absent or reduced in size. Like limacodids they seem to glide across leaf surfaces. Although this is the largest butterfly family, few species feed on trees—most use herbaceous plants, especially legumes. Many lycaenids are tended by ants. Tended species have dorsal glands that can secrete a nectar when the abdomen is drummed by solicitous ants.

Banded hairstreak
(*Satyrium calanus*)

Variable in color ranging from green to tan or dark brown marked with pinks, browns, and white. Most bear oblique subdorsal lines and subspiracular stripe. Somewhat imbricate with anterior end of each segment recessed under preceding one. Body with subtle subdorsal ridge that may be marked with pale stripe. Densely hairy, with longest hair forming subventral fringe around body. Several other hairstreaks co-occur with banded hairstreak, especially on oaks. Food: oaks, walnuts, and hickories. Caterpillar: May to June; 1 generation.

Olive hairstreak
(*Mitoura grynea*)

Deep green, festooned with white spotting, well camouflaged against scalelike leaves of its food plants. Body more rounded and legs more conspicuous than in many other lycaenids. Interrupted white subdorsal and subspiracular stripes. Food: cedars and junipers, especially eastern red cedar. Caterpillar: June to August; up to 3 generations in Deep South; 1 with partial second in North.

Skippers (Family Hesperiidae)

All skipper caterpillars may be immediately recognized by their distinctive shape: they have a large head and constricted neck (first thoracic segment). The body is widest toward the front of the abdomen then tapers to the rear. Each body segment is annulated and covered with numerous minute hairs. Crochets of 2 or 3 lengths are arranged in a circle. Many skippers have a distinctive anal comb that can be used to launch excreta away from the feeding site. Body coloration tends to be rather uniform—perhaps because the larvae feed within shelters—making species identification difficult. Caterpillars fashion silk-lined shelters, venturing out mostly at night to feed.

Silver-spotted skipper
(*Epargyreus clarus*)

Bright yellow-green, each body segment ringed with fine alternating black and yellow or greenish lines. Head dark red-brown, much wider than first thoracic segment, bearing large orange spot above each antenna. Abdominal segments with dark spot above black spiracles. Food: locust trees, wisterias, and other legumes. Caterpillar: May to November; 2 or more generations in South, 1 or 2 or more in North.

Juvenal's dusky wing
(*Erynnis juvenalis*)

Body chalky or waxy green dabbled with numerous pale spots. Head somewhat angulate to either side, deep reddish brown, with 3 pairs of orange spots, upper 2 pairs may be partly joined. Subdorsal stripe sometimes yellowish, occasionally indistinct. Other oak-feeding species of *Erynnis* occur in eastern forests; identifications should be confirmed through rearing. Food: oaks. Caterpillar: April until leaf fall, caterpillar overwinters in fallen leaf shelter; 1 generation.

Photography Credits

All photographs were taken by DLW and VG, except for the following species:

Acronicta hasta (penultimate instar): Charlene Houle
Acronicta superans: Jeff Fengler
Catocala ilia: Julie Henry
Graphium marcellus: Bob Wilson
Heterocampa biundata: Carol Lemmon
Lophocampa maculata: Charlene Houle
Lymantria dispar (last instar): Bob Wilson
Notodonta scitipennis: Bob Wilson
Nymphalis antiopa: Bob Wilson
Oligocentria lignicolor: Carol Lemmon
Oligocentria semirufescens: Phillip Arcand, Agriculture Canada
Panthea furcilla: Jeff Fengler
Papilio cresphontes: Bob Wilson
Papilio troilus (last instars): Bob Wilson
Parallelia bistriaris: Denise Simmonds
Parasa chloris: Carol Lemmon
Phyllodesma americana: Jeff Fengler
Polygonia comma: Denise Simmonds
Sphecodina abbottii: Alexander B. Klots

Glossary

Abdomen: 10 segments of body that immediately follow the claw-bearing thoracic segments.
Addorsal: close to the dorsal midline (see subdorsal).
Anal comb: a pronged structure just above the anus, and below the anal plate, used to eject frass away from the feeding site.
Anal plate: dorsal hardened area on the last (10th) abdominal segment.
Anal proleg: proleg arising from the last abdominal segment.
Annulated: ringed; body segments with shallow creases running around each segment as in many hornworms and loopers.
Antenna: elongate sensory structure just forward from the eyes.

Band: pattern running around segments perpendicular to the body axis or more or less vertical markings on head.

Crochets: hooklike structures on the abdominal prolegs used to grasp substrate.

Deciduous: detaching readily.
Dorsal: along the back or upper side of the caterpillar.
Dorsum: back or upper side of the caterpillar.

Eversible: capable of being turned inside out or everted.
Extrusible: capable of being protruded or enlarged.

Frass: pelletlike excrement.

Granulose: appearing grainy; with sandlike texture.
Gregarious: occurring in groups (because female lays eggs in clusters). Many species are gregarious in the early instars, but eventually disperse and become solitary.

Hypoproct: Fleshy spur ventral to anus in loopers (Geometridae), especially in those that rest on twigs (see paraproct).

Imbricate: overlapping, like the scales of a snake.
Instar: one of the larval stages. Most species have 5 or 6 instars before molting to the pupal stage.
Integument: cuticle or skin of caterpillar.
Intersegmental: between adjacent segments; intersegmental coloration is often concealed when caterpillar is foreshortened.

Labrum: upper lip; the flaplike plate that rests over the jaws.
Larva: caterpillar; immature feeding stage of butterflies and moths and other insects with complete metamorphosis.

Lash: long tuft or fascicle of grouped setae.
Lateral: along sides, typically at level of the spiracles.

Medial: running along or near the body midline.
Midabdominal prolegs: prolegs arising from third to sixth abdominal segments.
Middorsal: along dorsal midline of body.
Midventral: along ventral midline of body.

Paraproct: small, fleshy protuberances on either side of anus in loopers (Geometridae), often held against substrate (see hypoproct).
Polyphagous: eating plants from more than 1 or 2 plant families.
Prolegs: fleshy "legs" usually located on third through sixth and tenth abdominal segments, typically bearing hooklike spines.
Prothoracic shield: dorsal plate atop the first thoracic segment.
Prothorax: first thoracic segment; segment to which head attaches.

Scolus (scoli): elongate projection, often branched and hardened, from body wall bearing minute spines.
Seta (setae): hairlike outgrowth from head or body.
Setal base: hardened plate at base of seta; pinaculum.
Spatulate: widened at the apex like a spatula.
Specialist: feeding on species in a single plant genus or 2 closely related host genera.
Spinule: minute spine, often broadened at base.
Spinulose: bearing numerous minute spines or cuticular outgrowths.
Spiracles: lateral, oval to round openings of respiratory system found on the first thoracic and first 8 abdominal segments.
Spiracular: adjacent to or passing through the spiracles.
Stemmata: lateral eyes, typically cluster of 6 on each side of head.
Stripe: pattern that runs longitudinally along body axis.
Subapical: back from or below the apex.
Subdorsal: to either side of the dorsal midline (see addorsal).
Subspiracular: below level of spiracles and well above prolegs (see subventer).
Supraspiracular: above level of spiracles.
Subventral: area above level of legs and prolegs but below subspiracular area (see subspiracular)

Thorax: consists of 3 segments immediately behind head that bear true, claw-bearing legs.
Transverse: running around a body segment, perpendicular to body axis.
Triangle: triangular plate located between the eyes and above the mouth (Figure 2); elsewhere called frontal triangle or frons.
Truncated: appearing cut or squared off.
Tussocks: dense tufts of setae, often appearing truncated and of 1 length.

Urticating: causing itching or burning sensation to the skin and eyes, often caused by entry of poison-filled spines (whose tips often break off).

Venter: underside or "belly" of caterpillar.
Vertex: dorsal or top portion of head.

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