

*Nature's
Wonders*

Caterpillars



A 3D Model set by Ken Gilliland

Nature's Wonders

Caterpillars

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Caterpillars

Introduction

Caterpillars are the larval stage of members of the order *Lepidoptera* (the insect order comprising butterflies and moths). Caterpillars of most species eat plant material (often leaves), but not all; a very small percentage eat insects, and some are even cannibalistic. Caterpillars are typically voracious feeders and many of them are among the most serious of agricultural pests. Conversely, various species of caterpillar are valued as sources of silk, as human or animal food, or for biological control of pest plants.

Many animals feed on caterpillars as they are rich in protein. As a result, caterpillars have evolved various means of defense. The appearance of a caterpillar can often repel a predator: its markings and certain body parts can make it seem poisonous, or bigger in size and thus threatening, or non-edible. Some types of caterpillars are indeed poisonous or distasteful and their bright coloring warns predators of this. Others may mimic dangerous caterpillars or other animals while not being dangerous themselves. Many caterpillars are cryptically colored and resemble the plants on which they feed.

In the Old Testament of the Bible, caterpillars are feared as pest that devour crops, however, in the New Testament, their transformation to butterflies and moths was considered proof of Christ's resurrection; being "born again".

The Nature's Wonders Caterpillar is designed to emulate many different types of caterpillar and is rigged to give natural movement to the model. Included in this base set are 3 species of Hornworm; the Tomato, Tobacco and White-lined. It supports Poser's Firefly and Superfly and DAZ Studio 3Delight and Iray render engines.

Overview and Use

The set is located within the **Animals : Nature's Wonder** folder. Here is where you will find a number of folders, such as **Manuals**, **Resources** and **Fauna Libraries**. Let's look at what is contained in these folders:

- **Fauna Libraries:** This folder holds the actual species and poses for the "premade" fauna. The fauna for this set can be found in the following folder(s):
 - **Insects/Caterpillars of the World**
- **Manuals:** Contains a link to the online manual for the set.
- **Props:** Contains any props that might be included in the set
- **Resources:** Items in this folder are for creating and customizing your fauna included in the set
 - **... Based Models:** This folder has the blank, untextured model(s) used in this set. These models are primarily for users who wish to experiment with poses or customize their own

species. When using physical renderers such as Iray and Superfly, SubD should be turned to at least "3". For DAZ Studios 3Delight renders, the SubD must be turned from the "High Resolution" setting to the "Base" setting (otherwise some areas will render incorrectly transparent).

Loading a Caterpillar using Poser

1. Load Poser, select the FIGURES library and go to the "Animals", "Nature's Wonders" and then the Nature's Wonders Fauna Libraries Insect folder.
2. Go to the Caterpillars of the World folder and select the Firefly or Superfly sub-folder.
3. Select a Caterpillar of your choice and load the model clicking the mouse.

Loading a Caterpillar using DAZ Studio

1. Load DAZ Studio and go to the "Animals", "Nature's Wonders" and then the Nature's Wonders Fauna Libraries Insects folder.
2. Go to the Caterpillars of the World folder and select the Iray or 3Delight sub-folder.
4. Select a Caterpillar of your choice) and load the model clicking the mouse.

Sizing & Poser Related Issues

All the caterpillars included in this set have been scaled to their appropriate sizes in relation to human figure models. In some cases, these caterpillars can be quite small measuring around one-inch.

The size of the caterpillar can produce some issues in Poser and may disappear when the camera is in close focus. The "hither" setting on Poser's cameras is set to 0.800 by default. Reducing this setting to "0.0" will correct this issue.

A second issue can appear when rendering a small caterpillar solely (without any other items in the scene). It will produce a default square shadow. It is a known bug with Poser. To correct this issue, include a second larger item off-screen and the shadows will render correctly.

Posing

The base body part with this model is the "abdomen" part. This part, as well as the main body part, control and entire models XYZ Rotate and Transition. There are two separate Easy Pose chains. One controls the entire abdomen (Abdomen1-9) from the abdomen to tail, and the other controls the opposite sections (Thorax1-3 and head).

Using the Creation Controls

I realize for people who do venture into this area of the model, it can be at the very least confusing, so I try to explain some of the method in my madness.

The Main, Antennae and Max Palps sections I believe are self explanatory, so I'm going to venture into the Horns and Spinules Sections.

First of all, in the generic caterpillar model, there are two horns; a pair at the front (in the Head section) and one at the rear (in the Abdomen9 section). To use these horns, you must first turn them on; "Front Horns ON" and "Rear Horn ON". The "ON" dial brings up the basic horn morph(s). From there, you can play with size, bending, etc. Combining several morphs on top of the "ON" morph may cause some distortions-- they were designed to operate singly-- so use caution when combining them.

There are two rule breakers to what I've just said about the Horn Sections. The Front and Rear "Milkweed Shape" morphs do not need the "ON" switches turned on. They are specifically used to create the Milkweed (Monarch) caterpillar and because they are "horns", I placed them in the horn folder despite the fact they don't interact with the other horn morphs. In fact, the rear Milkweed Horns spring up from the "Analproleg" part, not the "Abdomen9" part where the rear horn is. If you're creating a fantasy caterpillar you could use the rear horn plus the rear Milkweed horns together.

Spinules are the spine locations for stinging caterpillars. There are three rows of spinules per side. Spinules1 are at the top sides of the caterpillar, Spinules2 are about halfway down to the waist and Spinules3 are at the waist. These spines will telescope out when the Spinules "ON" dials are at "1". You can turn them all on at once or each row individually to your desired effect. The default telescoped spinules are a little chunky, which is good for some caterpillars, but most will want a more tapered look, hence the "Spiny" controls.

The second half of the spinule controls revolve around "plumes". Many stinging caterpillars have plumes of hairs/spines coming around the spinules. The Spinules Plume "ON" switches bring up hidden transparency planes to emulate these. The default Plumes "ON" switch was designed for the Pointy/Tapered Spinules, which most caterpillars have. In cases, where you don't use the "Pointy" version, the "Spinules Plume1 Fix" dial will correct the Plumes morph to align better with the non-pointy spinules. The "Flower" controls will terrace the transparency planes along its respective spinule.

Finally, the Front and Rear Horns Spinule section... in some cases, you may want the horns to act as spinules rather than horns. These plumes were designed strictly for only the Horn "ON" dial(s) being active. Using the "other" horn morphs will probably give undesirable effects so use caution if you dial these as well.

Tomato Hornworm (*Manduca quinquemaculata*)

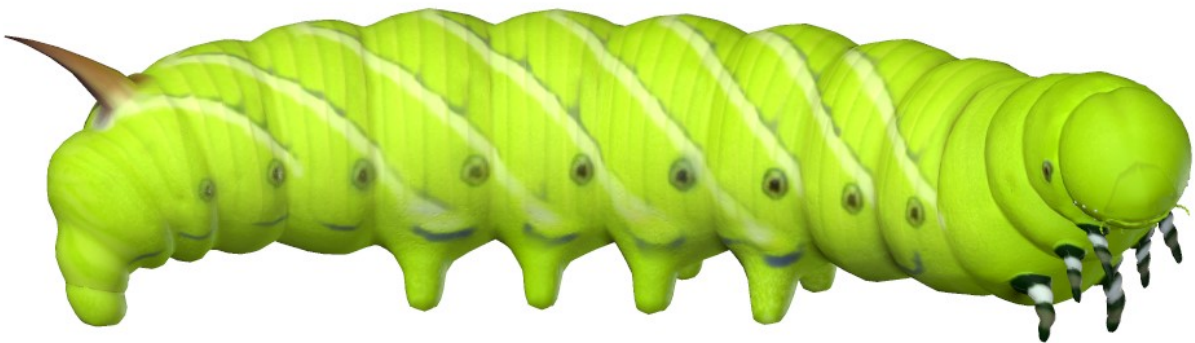
The tomato hornworm and its very close relative the tobacco hornworm are among the most common and destructive insects in the Northern Hemisphere. The tomato hornworm is a large green caterpillar that eats tomato plant leaves and young fruit. If you find one on your vines then you can be pretty sure that there are others. Despite their size, which is up to 4 inches (10.2 cm) in length, this caterpillar is often hard to find due to its camouflage, blending seamlessly with the plants leaves.

Venomous: This caterpillar is completely harmless. The horn on the tail is only for show (to frighten off predators).

Diet: Almost exclusively tomatoes, but sometimes other related plants. Several caterpillars can kill an entire tomato vine.

Where is it found: This species is found abundantly in the northern United States and southern Canada.

Metamorphosis: It becomes a Five-spotted Sphinx Moth (aka "Tomato Hawkmoth")



Tobacco Hornworm (*Manduca sexta*)

It is closely related to and often confused with the very similar tomato hornworm. It can be distinguished by their lateral markings: Tomato hornworms have eight V-shaped white markings with no borders while tobacco hornworms have seven white diagonal lines with a black border. In addition, tobacco hornworms have red horns, while tomato hornworms have dark blue or black horns. It is about 3-4 inches (7-10 cm) in length.

Captive-bred hornworms fed on an artificial diet are often given to insectivorous exotic animals, such as certain reptiles, fish and small mammals. They are preferred over wild-collected hornworms, which may bioaccumulate poisonous substances found in dietary plants.

Venomous: This caterpillar is completely harmless. The horn on the tail is only for show (to frighten off predators). Tobacco hornworm caterpillars emit short clicking sounds from their mandibles when they are being attacked. This sound production is believed to be a type of acoustic aposematism (making warning sounds that let predators know that trying to eat them will be troublesome). These hornworms have been observed to thrash and bite predators after producing those clicking sounds. These clicks can be heard at a close distance with a frequency range of 5 to 50 kHz.

Diet: It prefers the foliage of plants belonging to the *Solanaceae* (tomato/potato) family. Their most favorite host is the tobacco plant. Tobacco hornworms are considered pests because they feed on the upper leaves of tobacco plants and leave green or black droppings on the plants.

Where is it found: This species is very common in the southern states of the United States although their habitat stretches from Canada to Argentina.

Metamorphosis: It becomes a Carolina Sphinx Moth.



White-lined Hornworm (*Hyles lineata*)

This caterpillar tends to look yellow and yellow-green, markings may differ depending on the climate and weather. If it's in hot weather, stripes or even a solid black coloring may appear. It is 3 to 4 inches (7.5-10.2 cm) in length. In late summer and early fall, these caterpillars are often seen migrating along the ground on their way to finding the perfect soil in which to stage their next metamorphosis — into the adult moth stage.

Venomous: This caterpillar is completely harmless. The horn on the tail is only for show (to frighten off predators).

Diet: While many hornworms spell doom for a vegetable garden, this caterpillar isn't one of them. They may nibble a little bit along the way, but they will have little effect on those plants. This caterpillars feeds on a wide range of plants including purslane, portulaca, wild grape, plus weeds and various desert shrubs. They tend to stick with low, shrubby plants.

Where is it found: This species has a very large range. It extends from Central America to southern Canada through Mexico and most of the United States. They can also be found occasionally in the West Indies. There have been rare, isolated reports of them in Eurasia and Africa.

Metamorphosis: It becomes a White-lined Sphinx Moth.



Special Thanks to my Beta-Testing Team...

Alisa & FlintHawk

Species Accuracy and Reference Materials

The author has tried to make these species as accurate to their real life counterparts as possible. With the use of one generic model to create dozens of unique species, some give and take is bound to occur. The texture maps were created in Corel Painter with as much accuracy as possible.

Field Guide Sources:

- **Wikipedia** https://en.wikipedia.org/wiki/Main_Page
- **Owlcation** <https://owlcation.com/>

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prints, cards, posters, pillows,
coffee cups, calendars & more**

