A 3D Model set by Ken Gilliland

Nature's Wonders Bee

Base Model

Nature's Wonders Bee

Introduction

The Nature's Wonders Bee model allows the creation of many species with the superfamily, *Apoidea,* which containing at least 5,700 species of bees and wasps. The model supports the creation of Honey bees, Bumblebees, Wasps, Hornets, Yellow Jackets, Daubers and Cicada Killers.

This set contains character presets and textures for the Western Honey Bee (Queen/Worker/Drone). Honey bees are native to Eurasia, but spread to four other continents by humans. There are only seven species of honey bee that are recognized, with a total of 44 subspecies. Honey bees represent only a small fraction of the roughly 20,000 known species of bees.

The study of bees, which includes the study of honey bees, is known as "Melittology".

Bees show an advanced level of social organization, in which a single female or caste produces the offspring and non-reproductive individuals cooperate in caring for the young. They are known for construction of perennial, colonial nests from wax, for the large size of their colonies, and for their surplus production and storage of honey, distinguishing their hives as a prized foraging target of many animals, including honey badgers, bears and human hunter-gatherers.

The Western Honey bee has been domesticated for honey production and crop pollination. Bee wax is used for candlemaking, soapmaking, lip balms, and other crafts.

The Nature's Wonders Bee Base set comes in both Poser and DAZ Studio native versions and support Firefly, 3Delight, Superfly and Iray render engines.

Overview and Use

This set uses a common model to recreate digitally the *Apoidea* species included in this volume. Each species uses specific morphs from the generic model to single-out its unique features. Select **Figures** in the Runtime Folder and go to the **Nature's Wonders Insects** folder:

- **Models included in this volume:**
  - **Nature's Wonders Bee Base** - This model is used with all bees included in this set. The "blank" version of this model is in the Resources folder,
  - **Nature's Wonders Pollen "Saddlebags"** - This model is an optional conforming part for the bees included in this set.

Creating a Honey bee using Poser

1. For this example, we'll create a Western Honey bee worker.
2. Load Poser, select the FIGURES library and go to the Animals / Nature's Wonders Insects / **Bees of the World** folder and the Firefly or Superfly sub-folder.
3. Select the Western Honey bee worker (or a bee of your choice).

Creating a Honey bee using DAZ Studio

1. For this example, we'll create a Western Honey bee worker.
2. Load DAZ Studio and go to the Animals / Nature's Wonders Insects / **Bees of the World f**older and select the sub-folder of which renderer you want to use, 3Delight or Iray.
3. Select the Western Honey bee Worker (or a bee of your choice).

The InsectCam

All of the *Apoidea* species in this set have been scaled to their appropriate sizes in relation to human figure models. In most cases, these can be very small. With that in mind, this set comes with an "InsectCam".

The InsectCam is a camera set-up to focus on the default position of the insect. With Poser, it will also change the "hither" setting from its default value of 0.800 to 0.0 to allow close focus.

Pollen "Saddlebags"

Pollen "saddlebags" have be included in this set. This attachment can be found in the **Bees of the World / Props** folder. They will conform/fit to the hind legs of any of the honey bees included. Include in the "BODY" section of this prop is a morph to lessen/add to the amount of pollen.

Posing the Bee Model, Sizing & Poser Issues

With most figure-based models the center of the model is the "hip" area. The thorax is considered the "hip" in this model.

An issue that can appear when rendering in Poser, with only a bee (no other items) in the scene, is that it will produce a default square shadow. It is a known bug within Poser. To correct this issue, include a second larger item off-screen and the shadows will render correctly.

Poser's Superfly Renderer has trouble with overlaying transparency planes and can causes streaks and artifacts in the render. Using the "Physical Renderer Fix" morph and altering the hair morphs (in Creation Controls/Hair Controls) can help to minimize these issues, As a last resort, the "Hide Hair" controls turned to "1" (in Creation Controls/Hair Controls) remove the offending transparency planes and will resolve the issues.

General Information on Honey Bees

A honey bee is a flying insect within the genus *Apis* of the bee clade. Honey bees are native to Eurasia but spread to four other continents by humans.

There are only seven species of honey bee that are recognized, with a total of 44 subspecies. Honey bees represent only a small fraction of the roughly 20,000 known species of bees. Some other types of related bees produce and store honey and have been kept by humans for that purpose, including the stingless honey bees, but only members of the genus Apis are true honey bees. The study of bees, which includes the study of honey bees, is known as melittology.

They show an advanced level of social organization, in which a single female or caste produces the offspring and non-reproductive individuals cooperate in caring for the young. They are known for construction of perennial, colonial nests from wax, for the large size of their colonies, and for their surplus production and storage of honey, distinguishing their hives as a prized foraging target of many animals, including honey badgers, bears and human hunter-gatherers.

Within the social organization there are two castes of females; sterile **workers** which are smaller and the fertile **queens** are larger. Males, called **drones**, are larger in size than workers but shorter wing lengths than workers. Drones have no stingers, while workers can sting once.

The best known honey bee is the western honey bee which has been domesticated for honey production and crop pollination; modern humans also value the wax for candlemaking, soapmaking, lip balms, and other crafts.

Types of Honey Bees

Koschevnikov's honey bee
Apis koschevnikovi is often referred to in the literature as the "red bee of Sabah"; however, A. koschevnikovi is pale reddish in Sabah State, Borneo, Malaysia, but a dark, coppery color in the Malay Peninsula and Sumatra, Indonesia. Its habitat is limited to the tropical evergreen forests of the Malay Peninsula, Borneo and Sumatra and they do not live in tropical evergreen rain forests which extend into Thailand, Myanmar, Cambodia and Vietnam.

Philippine honey bee
Apis nigrocincta is a cavity-nesting species. The species has rust-colored scapes, legs, and clypeuses, with reddish-tan hair color that covers most of the body.

Eastern honey bee
Apis cerana, the eastern honey bee proper, is the traditional honey bee of southern and eastern Asia. It was domesticated as subspecies A. c. indica and

kept in hives in a fashion similar to A. mellifera, though on a more limited, regional scale.

It has not been possible yet to resolve its relationship to the Bornean *A. c. nuluensis* and *Apis nigrocincta* from the Philippines to satisfaction; the most recent hypothesis is that these are indeed distinct species, but that *A. cerana* is still paraphyletic, consisting of several separate species.

Western honey bee
The European or Western honey bee, *A. Mellifera,* is the most common domesticated bee species. It seems to have originated in eastern tropical Africa and spread from there to Europe and eastwards into Asia to the Tien Shan range. It is variously called the European, western, or common honey bee in different parts of the world. Many subspecies have adapted to the local geographic and climatic environments; in addition breeds such as the Buckfast bee, have been bred. Behavior, color, and anatomy can be quite different from one subspecies or even strain to another.

Africanized bee
Africanized bees (known colloquially as "killer bees") are hybrids between European stock and the East African lowland subspecies *A. m. scutellata*; they are often more aggressive than European bees and do not create as much of a honey surplus, but are more resistant to disease and are better foragers. Accidentally released from quarantine in Brazil, they have spread to North America and constitute a pest in some regions. However, these strains do not overwinter well, so are not often found in the colder, more northern parts of North America. The original breeding experiment for which the African bees were brought to Brazil in the first place has continued (though not as originally intended). Novel hybrid strains of domestic and redomesticated Africanized bees combine high resilience to tropical conditions and good yields. They are popular among beekeepers in Brazil.

Megapis
One species is recognized in the subgenus Megapis. It usually builds single or a few exposed combs on high tree limbs, on cliffs, and sometimes on buildings. They can be very fierce. Periodically robbed of their honey by human "honey hunters", colonies are easily capable of stinging a human being to death if provoked.

Micrapis

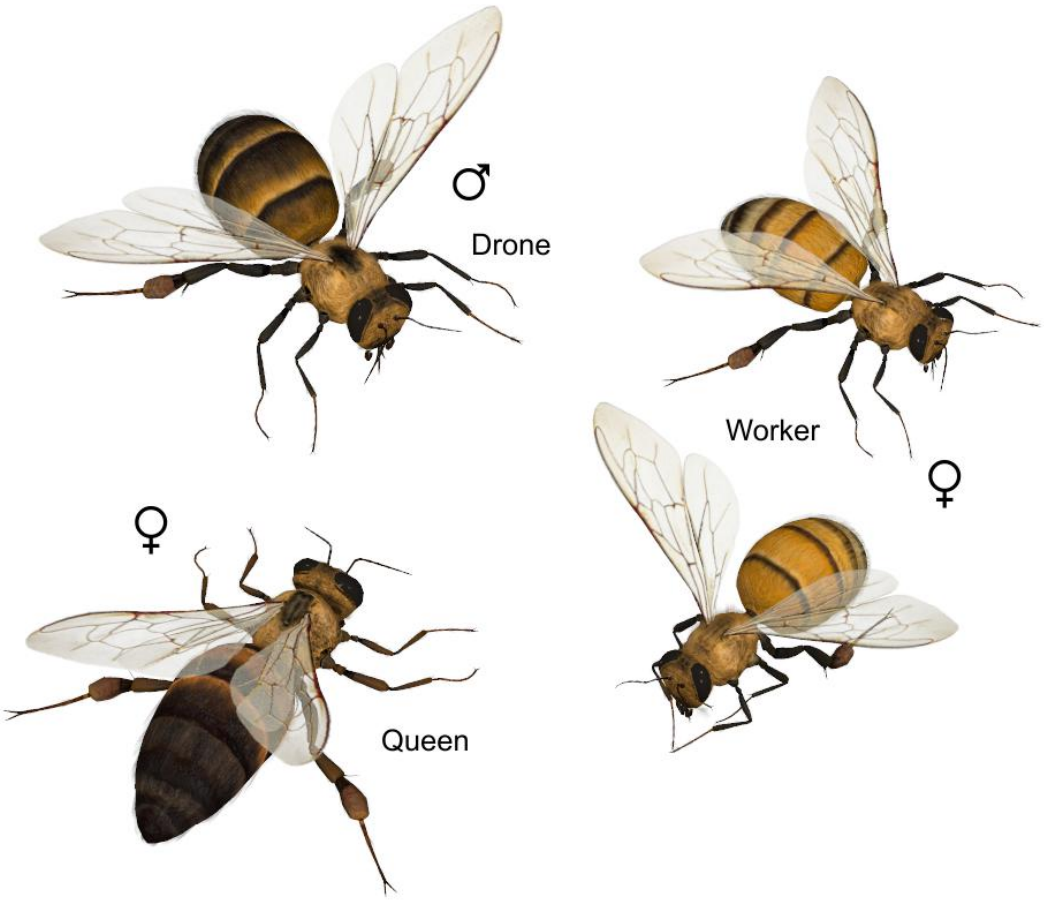
Apis florea and *Apis andreniformis* are small honey bees of southern and southeastern Asia. They make very small, exposed nests in trees and shrubs. Their stings are often incapable of penetrating human skin, so the hive and swarms can be handled with minimal protection. They occur largely sympatrically, though they are very distinct evolutionarily and are probably the result of allopatric speciation, their distribution later converging.

Western Honey Bee

Apis mellifera

Range: The western honey bee can be found on every continent except Antarctica. The species is believed to have originated in Africa or Asia, and it spread naturally through Africa, the Middle East and Europe. Humans are responsible for its considerable additional range, introducing European subspecies into North America (early 1600s), South America, Australia, New Zealand, and eastern Asia. In 1622, European colonists brought the European dark bee (*A. m. mellifera*) to the Americas first, followed later by the Italian honey bee (*A. m. ligustica*) and others.

Many of the crops that depend on western honey bees for pollination have also been imported since colonial times. Escaped swarms (known as "wild" bees, but actually feral) spread rapidly as far as the Great Plains, usually preceding the colonists. Honey bees did not naturally cross the Rocky Mountains; they



were transported by the Mormon pioneers to Utah in the late 1840s, and by ship to California in the early 1850s.

Habitat and Ecology: This species inhabits streams and rivers of the arid southwest.

Size: Total Length: worker adults 10-15 mm long; queens 18-20 mm long; drones 15-17 mm long.

Description: There are numerous subspecies. Many subspecies have adapted to the local geographic and climatic environments. Behavior, color, and anatomy can be quite different from one subspecies or even strain to another. This set focuses one of the most common of the subspecies (*A. m. mellifera*).

- *Apis mellifera adami*. First reported by Ruttner in 1975 - (Cretan honey bee) The island of Crete
- *Apis mellifera artemisia.* First reported by Engel in 1999 - Russian Steppes.
- *Apis mellifera carnica.* First reported by Pollmann, 1879 - (Carniolan honey bee) The Carniola region of Slovenia, the Eastern Alps and the northern Balkans - popular with beekeepers due to its extreme gentleness. The Carniolan honey bee tends to be quite dark in color and the colonies are known to shrink to small populations over winter and build very quickly in spring. It is a mountain bee in its native range and is a good bee for colder climates.
- *Apis mellifera caucasia.* First reported by Pollmann in 1889 - (Caucasian honey bee) The Central Caucasus.
- *Apis mellifera cecropia.* First reported by Kiesenwetter in 1860 - (Greek honey bee) Southern Greece
- *Apis mellifera cypria.* First reported by Pollmann in 1879 - (Cyprus honey bee) The island of Cyprus - this subspecies has the reputation of being very fierce compared to the Italian subspecies, from which it is isolated by the Mediterranean Sea.
- *Apis mellifera iberiensis.* First reported by Engel in 1999 - (Spanish honey bee) The Iberian Peninsula (Spain and Portugal)
- *Apis mellifera ligustica.* First reported by Spinola in 1806 - (Italian honey bee) The most commonly kept subspecies in North America, South America and southern Europe. They are kept commercially all over the world. They are very gentle, not very likely to swarm and produce a large surplus of honey. They have few undesirable characteristics. Colonies tend to maintain larger populations through winter, so they require more winter stores (or feeding) than other temperate zone subspecies. The Italian bee is light-colored and mostly leather-colored, but some strains are golden.
- *Apis mellifera macedonica.* First reported by Ruttner in 1988 - (Macedonian honey bee) Northern Greece (Macedonia and Thrace), North Macedonia. Possibly synonymous with *A. m. artemisia* (Russian steppe honey bee) as described by Engel, 1999.
- *Apis mellifera mellifera*. First reported by Linnaeus in 1758 - (European dark honey bee) the dark-colored bee of northern Europe, also called the German black honey bee or German honey bee. Domesticated in modern times and taken to North America in colonial times.
- *Apis mellifera ruttneri.* First reported by Sheppard, Arias, Grech & Meixner in 1997 - (Maltese honey bee) the Maltese islands

- *Apis mellifera remipes.* First reported by Gerstäcker in 1862 (*armeniaca* is a junior synonym) - (Armenian honey bee) The Caucasus, Iran, the Caspian Sea.
- *Apis mellifera siciliana.* First reported by Grassi in 1881 (*sicula* is a junior synonym) - (Sicilian honey bee) from the Trapani province and the island of Ustica of western Sicily (Italy)
- *Apis mellifera sossimai.* First reported by Engel in 1999 (includes former *A. c. gerstaecker*, 1862) - (Ukrainian honey bee) Ukraine (Crimea excepted) and northern regions of the Caucasus Mountains
- *Apis mellifera taurica.* First reported by Alpatov in 1935 - Crimea.
- *Apis mellifera adansonii.* First reported by Latreille in 1804 - (West African honey bee) Nigeria, Burkina Faso
- *Apis mellifera capensis.* First reported by by Eschscholtz in 1822 - (Cape honey bee) South Africa
- *Apis mellifera intermissa*. First reported by von Buttel-Reepen in 1906; Maa, 1953 (major is a junior synonym) - (Tunisian honey bee) Northern part of Africa in the general area of Morocco, Libya and Tunisia. These bees are totally black. They are extremely fierce, but do not attack without provocation. They are industrious and hardy, but have many negative qualities that argue against their being favored in the honey or pollination industry.
- *Apis mellifera jemenitica*. First reported by Ruttner in 1976 (*nubica* is a junior synonym) - (Arabian honey bee) Somalia, Uganda, Sudan, Yemen
- *Apis mellifera lamarckii*. First reported by Cockerell in 1906 - (Egyptian honey bee) The Nile Valley of Egypt and Sudan. This mitotype can also be identified in honey bees from California.
- *Apis mellifera litorea*. First reported by Smith in 1961 - (East African coastal honey bee) Low elevations of East Africa
- *Apis mellifera monticola,* classified by Smith in 1961 - (East African mountain honey bee) High altitude mountains at elevation between 1,500 and 3,100 m of East Africa (Mt. Elgon, Mt. Kilimanjaro, Mt. Kenya and Mt. Meru)
- *Apis mellifera sahariensis.* First reported by Baldensperger in 1932 - (Saharan honey bee) The Moroccan desert oases of Northwest Africa. This subspecies faces few predators other than humans and is therefore very gentle. Moreover, because of the low density of nectar-producing vegetation around the oases it colonizes, it forages up to five miles, much farther than subspecies from less arid regions. Other authorities say that while colonies of this species are not much inclined to sting when their hives are opened for inspection, they are, nevertheless, highly nervous.
- *Apis mellifera scutellata.* First reported by Lepeletier in 1836 - (East African lowland honey bee) Central and East Africa, now as hybrids also in South America, Central America and the southern U.S.. In an effort to address concerns by Brazilian beekeepers and to increase honey production in Brazil, Warwick Kerr, a Brazilian geneticist, was asked by Brazilian Federal and State authorities in 1956 to import several pure East African lowland queens from Tanzania to Piracicaba-São Paulo State in the south of Brazil. In a mishap, some queens escaped. The East African lowland queens eventually mated with local European honey bee drones and produced what are now known as “Africanized” honey bees on the

American continent. The intense struggle for survival of honey bees in sub-Saharan Africa is given as the reason that this subspecies is proactive in defending the hive and also more likely to abandon an existing hive and swarm to a more secure location. They direct more of their energies to defensive behaviors and less of their energies to honey storage. East African lowland honey bees are leather-colored and difficult to distinguish by eye from darker strains of Italian honey bees.

- *Apis mellifera simensis.* First reported by Meixner et al in 2011 - (Ethiopian honey bee) Ethiopia.
- *Apis mellifera unicolor*. First reported by Latreille in 1804 - (Madagascan honey bee) Madagascar.
- *Apis mellifera anatoliaca.* First reported by Maa in 1953 - (Anatolian honey bee) This subspecies is typified by colonies in the central region of Anatolia in Turkey and Iraq (range extends as far east as Armenia). It has many good characteristics, but is rather unpleasant to deal with in and around the hive.
- *Apis mellifera meda.* First reported by Skorikov in 1929 - (Persian honey bee) Iraq
- *Apis mellifera pomonella.* First reported by Sheppard & Meixner in 2003 - (Tien Shan honey bee) Endemic honey bees of the Tien Shan Mountains in Central Asia. This subspecies has a range that is the farthest east known of *Apia mellifera*..
- *Apis mellifera sinisxinyuan*. First reported by unknown in 2016. (Xinyuan honey bee) Xinjiang Uygur Autonomous Region, Urumqi, Xinjiang, China.
- *Apis mellifera syriaca.* First reported by Skorikov in 1929 - (Syrian honey bee) The Near East and Israel.

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Rarity and Status: The status of bees was assessed at two regional levels: geographical Europe and the EU 27.

9.2% and 9.1% of the species are considered threatened at the European and EU 27 levels, respectively. However, the proportion of threatened bee species is uncertain given the high number of Data Deficient species, and could lie between 4% (if all DD species are not threatened) and 60.7% (if all DD species are threatened) for Europe, and 4% and 59.7% for the EU 27. Thus, the mid-point figures provide the best estimation of the proportion of threatened species.

In Europe, 0.4% of the species are Critically Endangered, 2.4% are Endangered, and 1.2% Vulnerable. A further 5.2% are classified as Near Threatened. In the EU 27, 0.3% of the species are Critically Endangered, 2.4% are Endangered, and 1.3% are Vulnerable. A further 5.4% are classified as Near Threatened.

For more than half of the species in Europe (56.7%) and in the EU 27 (55.6%), there was not enough data to evaluate their risk of extinction and so they were classified as Data Deficient. As more data becomes available, it is possible that many of these species may also prove to be threatened.

Western honey bee populations face threats to their survival increasing interests into other pollinator species, like the common eastern bumblebee. North American and European populations were severely depleted by Varroa mite infestations during the early 1990s, and U.S. beekeepers were further affected by colony collapse disorder in 2006. Improved cultural practices and chemical treatments against Varroa mites saved most commercial operations; new bee breeds are beginning to reduce beekeeper dependence on pesticides.

Feral bee populations were greatly reduced during this period, however they are slowly recovering, primarily in mild climates, due to natural selection for Varroa resistance and repopulation by resistant breeds. Although, it is generally believed that insecticides have also depleted bee populations, particularly when used in excess of label directions.

A new study in 2020 found that neonicotinoid insecticides affected the developmental stability of honey bees, particularly haploid males were more susceptible to neonicotinoids than diploid females. The 2020 study also found that heterozygosity may play a key role in buffering insecticide exposure.

Special Thanks to:

.. to my beta testers, FlintHawk and Carey

Sources:

Wikipedia (https://www.wikipedia.org/)

Other Resources:

This set is being released at the same time as two other “like” sets:

- Nature’s Wonders Beekeeping. A prop set which includes numerous beekeeping products such as Hive boxes with removable frames, a smoker and a bee tool.
- Nature’s Wonders Bees of the World, Volume 1. This set includes six species from the *Apoidea* superfamily (a bumblebee, cicada killer, mud dauber, wasp, hornet and yellowjacket)


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