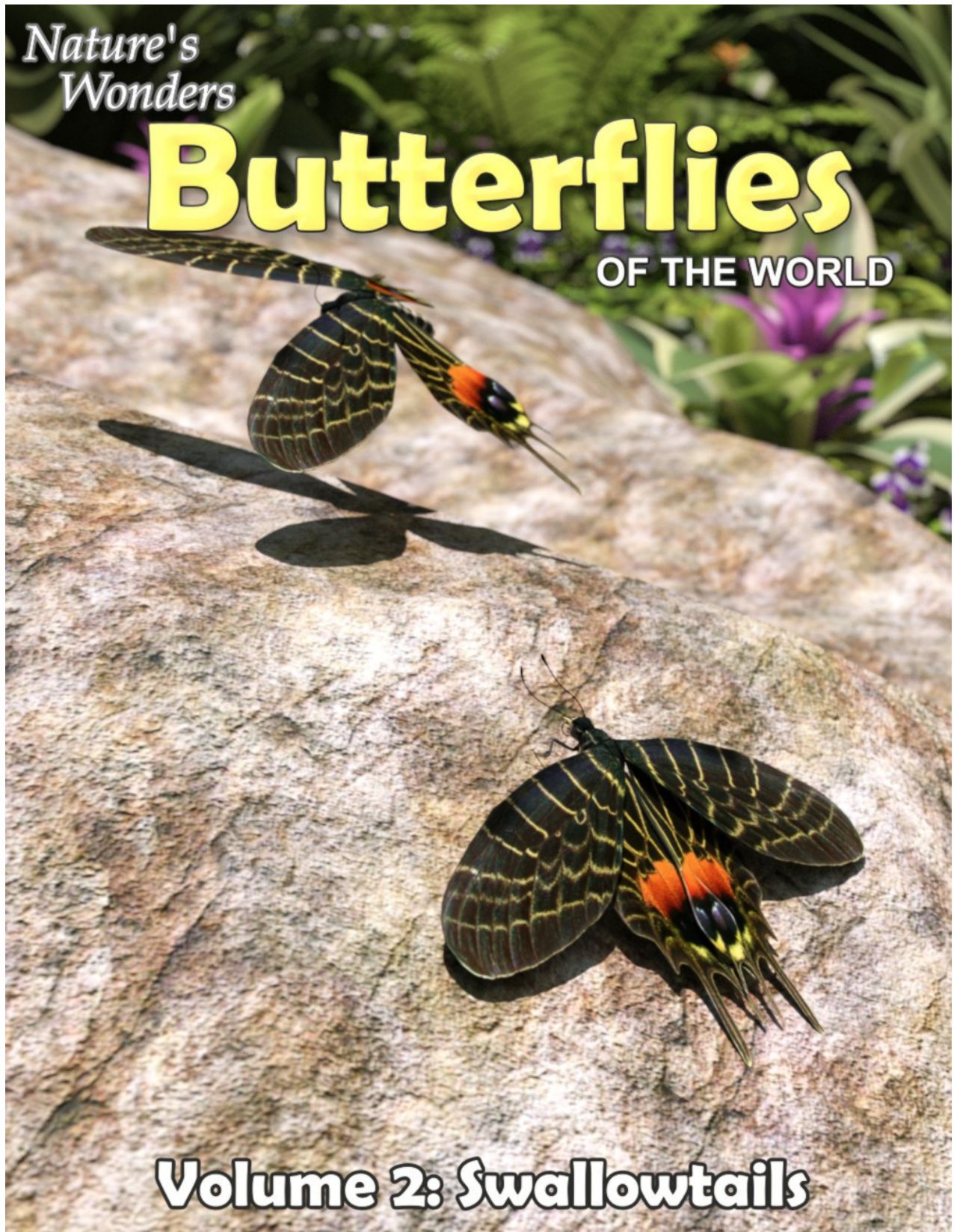


*Nature's
Wonders*

Butterflies

OF THE WORLD



Volume 2: Swallowtails

A 3D Model set by Ken Gilliland

Nature's Wonders

Butterflies

of the World Volume 2: Swallowtails

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Nature's Wonders

Butterflies

of the World Volume 2: Swallowtails

Introduction

Butterflies and moths belong to the insect Order Lepidoptera, which is a word that comes from the Greek words for “scale” and “wing.” While most of the 150,000 species in this order are moths, there are an estimated 18,000 butterfly species found globally. The earliest known butterfly fossils date to the mid Eocene epoch, between 40–50 million years ago.

Nature's Wonders Butterflies of the World Volume 2 add-on set expands the 3D butterfly world with 8 species of Swallowtail found through the globe. They are large, colorful butterflies in the family *Papilionidae*, and include over 550 species. Though the majority are tropical, members of the family inhabit every continent except Antarctica and include the largest butterflies in the world, the birdwing butterflies. The forked appearance in some of the swallowtails' hindwings, which can be seen when the butterfly is resting with its wings spread, gave rise to the common name swallowtail.

This set 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/Butterflies 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 Butterfly 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 Butterflies of the World folder and select the Firefly or Superfly sub-folder.
3. Select a butterfly of your choice and load the model clicking the mouse.

Loading a Butterfly 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 Butterflies of the World folder and select the Iray or 3Delight sub-folder.
3. Select a butterfly 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 butterflies can be quite small measuring around one-inch.

The size of the butterfly 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 butterfly 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 "Thorax 1" part. This part, as well as the main body part, control and entire models XYZ Rotate and Transition. There are several Easy Pose chains. One controls the entire abdomen (Abdomen1-5) from the abdomen to tail. There are two other chains; one controlling the Proboscis (nectar feeding tube) and one with controls for each individual Antennae.

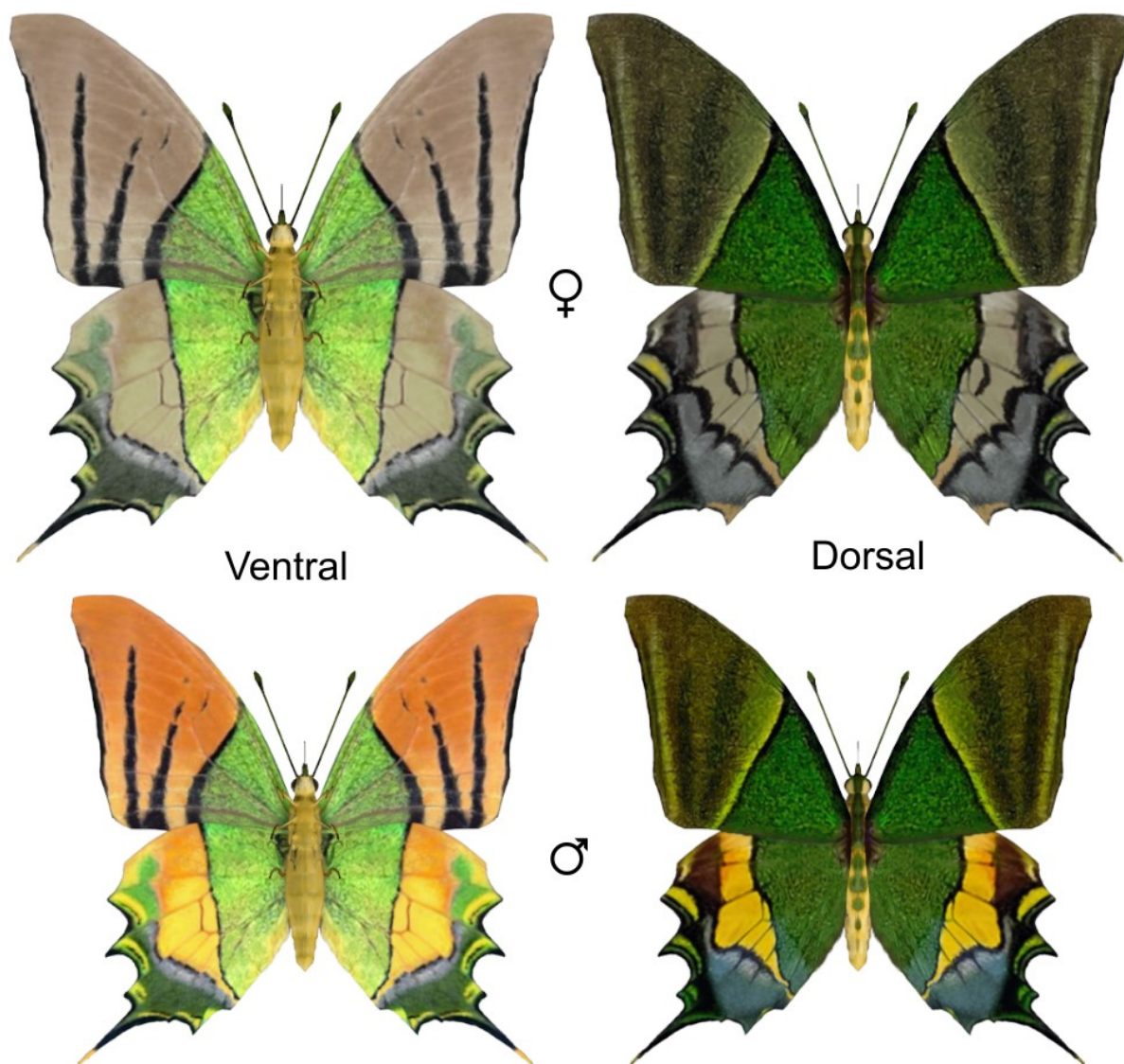
The Proboscis, by default (0), is fully outstretch for feeding. When not feeding, the "ProboscisBendAll" dial spun to 33 is the normal position.

Butterfly Family Types

Family	Common name	Characteristics	Image
<i>Hedylidae</i>	American moth-butterflies	Small, brown, like geometrid moths; antennae not clubbed; long slim abdomen	
<i>Hesperiidae</i>	Skippers	Small, darting flight; clubs on antennae hooked backwards	
<i>Lycaenidae</i>	Blues, coppers, hairstreaks	Small, brightly colored; often have false heads with eye spots and small tails resembling antennae	
<i>Nymphalidae</i>	Brush-footed or four-footed butterflies	Usually have reduced forelegs, so appear four-legged; often brightly colored	
<i>Papilionidae</i>	Swallowtails	Often have 'tails' on wings; caterpillar generates foul taste with osmeterium organ; pupa supported by silk girdle	
<i>Pieridae</i>	Whites and allies	Mostly white, yellow or orange; some serious pests of <i>Brassica</i> ; pupa supported by silk girdle	
<i>Riodinidae</i>	Metalmarks	Often have metallic spots on wings; often conspicuously colored with black, orange and blue	No image available

Kaiser-i-hind (*Teinopalpus imperialis*)

It is a predominantly green swallowtail. The male has a bright chrome-yellow patch on each hind wing. The dorsal side is black, densely speckled with green scales. It has a narrow terminal edging that is jet-black. The hindwings basal area is margined outwardly by a narrow irregularly sinuous band and devoid of green scaling. It is succeeded by an upper discal bright chrome-yellow patch that spreads from base of the interspaces. On the ventral sidebar area of both the forewings and hindwings, it is densely covered with green scales. The forewing terminal area is about two-thirds rich ochraceous brown, the green of the basal area bordered by black while the hindwing patterning is similar to the dorsal side, but the yellow markings are broader. The antennae dark red, the head, thorax and abdomen are black, covered somewhat densely with green hairs and scales. The female is much larger and slightly differs also in coloration and markings. The Kaiser-i-hind wingspans ranges from 3.5 - 4.75 inches (9-12 cm).



Where is it found: It found in small pockets of Nepal, Bhutan and along the Eastern Himalayas in India (West Bengal, Meghalaya, Assam, Sikkim and Manipur). It is also found in northern Myanmar, northern Vietnam and in the

Sichuan province of China.

It is a high-altitude forest species that occurs at medium and higher elevations in the Himalayas from 6,000 to 10,000 feet (1,800 to 3,000 m) in well-wooded terrain. In the northeastern part of its range (in India), much of its forest habitat has been degraded by “slash and burn” cultivation. The butterfly is rarely found in these degraded patches.

It flies at tree-top level until it chooses to descend if there is strong morning sunlight. When overcast, males are known to descend and sit on low vegetation, where its disruptive, dull underside coloration makes it difficult to distinguish. Females are known to fly in overcast and rainy weather also. Males visit damp patches and also suck moisture from leaves. Females rarely visit flowers or damp patches. It is often found on forest clearings and open spaces flanked by forests on hills and mountains. These are mostly males, who establish territories and aggressively drive away other intruding males, and stopping virgin females in search of mates.

Diet: Nectar from plants. The larvae feed on *Magnolia campbellii* (Magnoliaceae)

Threats: This “Near Threatened” swallowtail is protected by Indian and Nepalese law, however the protection enforcement in these countries not effective because collectors are willing to pay high prices. The Kaiser-i-Hind would be a keystone species for conservation of high-altitude forest. The conservation programs in India is complicated by the fact that most of the responsibility for conservation action runs at the state level and not at the national level.

Other Notes: The common name literally means "emperor of India". The Kaiser-i-Hind is much sought after by butterfly collectors for its beauty and rarity.

Bhutan Glory (*Bhutanitis lidderdalii*)

Both the male and female have the dorsal side of their wings a dull black. The fore wing has ochraceous slender markings. The hind wing also has the ochraceous lines more or less in continuation of those on the fore wing with the addition of a broad line along veins. There is a large lower discal patch, the inward half scarlet, the outer half velvety-black, followed by broad subterminal bright yellow lunules in interspaces. The tail is edged very narrowly with an ochraceous white. The black on the outer half of the discal patch has in interspaces 1 and 2. There are very large ill-defined superposed white spots thickly shaded with brownish-gray except along their inner margins. The ventral side is similar, except the markings are broader and the base of cell in the hind wing is crossed by a short ochraceous-white bar, and the edges of the pre-costal cell with narrow lines of the same color. The antennae is black and the head, thorax and abdomen are a dull black; the thorax is a greenish-gray laterally, with the sides of the abdomen having cross-lines of an ochreous-white. The females are larger than the males. It has a wingspan of 3.5–4.3 inches (9–11 cm).



Where is it found: It is found in Bhutan, parts of northeastern India and of Southeast Asia. □

It flies from 5,000 to 9,000 feet (1,500 to 2,700 m) in its Indian range. It generally keeps to the ridges rather than the valleys.

Diet: Their primary food source is plants in the *Aristolochia* family (Dutchman's pipe) such as *A. kaempferii*, *A. mandshuriensis*, *A. griffithii*, *A. shimadai* and *A. debilis*.

Threats: The Bhutan Glory has been considered to be "rare" and is protected under law in India, however enforcement is poor. Habitat loss due to excessive felling of forests may be a significant threat regionally.

Other Notes: There are a total of four subspecies:

- *B. l. lidderdalii*. First reported by Atkinson in 1873. The nominate subspecies is found in Buxa in Bhutan.
- *B. l. spinosa*. First reported by Stichel in 1907. It is endemic to the Sichuan province in China.
- *B. l. ocellatomaculata*. First reported by Igarashi in 1979. It is endemic to Chiang Mai in northern Thailand.
- *B. l. nobucoae*. First reported by Morita in 1997. It is endemic to northern Kachin in Myanmar.

Zebra Swallowtail (*Eurytides marcellus*)

Its distinctive wing shape and long tails make it easy to identify, and its black-and-white-striped pattern is reminiscent of a zebra. The triangular wings are white to greenish white with black longitudinal stripes. A pair of swordlike tails extend from the hindwings. The inner margin of the hindwing has two blue spots on the corner and a red spot near the body. A red stripe runs along the middle of the ventral hindwing. It has two seasonal forms, one occurring in the spring and the other in the summer. Spring forms are smaller, more white, and have short, black tails with white tips. Summer forms are larger, have broader black stripes, and longer, black tails with white edges

It has a wingspan of 2.5-4.1 inches (6.4-10.4 cm).

Where is it found: It is native to the eastern United States and south-eastern Canada.

The butterflies are closely associated with pawpaws, and are rarely found far from these trees. The green or black caterpillars feed on the leaves of various pawpaw species, while the adults feed on flower nectar and minerals from damp soil.



Diet: The zebra swallowtail caterpillar feeds on species within the genus *Asimina* (Pawpaw). Commonly used species include slimleaf pawpaw (*A. angustifolia*), woolly pawpaw (*A. incana*), smallflower pawpaw (*A. parviflora*), netted pawpaw (*A. reticulata*), four-petal pawpaw (*A. tetramera*), and common pawpaw (*A. triloba*).

Caterpillars ingest neurotoxic chemicals called annonaceous acetogenins from their host plants, which are retained in the body tissues of both the caterpillar and the adult, and may help chemically protect the butterfly from birds.

Threats: Climate change poses serious threats and advantages to this species.

Other Notes: It is the state butterfly of Tennessee.

Giant Swallowtail (*Papilio cresphontes*)

The wings are black with a horizontal yellow line across the forewings, and a diagonal yellow line across the hindwing. The underside of the wings is yellow with accents of black. A small patch of red on the ventral wing (within the small blue band). Females have an average wingspan of 5.5 inches (14 cm), and up to 6.9 inches (18 cm), while males' average is 5.8 inches (15 cm), and up to 7.4 inches (19 cm).

Where is it found: It is common across the United States, reaching as far north as southern New England and southern Canada. South of the United States, it is found in parts of Mexico and also found in Jamaica and Cuba. The



species was historically considered to occur in the western United States and into South America, but now those populations are treated as a separate species, *Papilio rumiko*, based largely on DNA evidence.

In the United States, it mostly inhabit deciduous forest and citrus orchards. They are only capable of overwintering in Florida and the deep South.



Diet: Nectar plants for adults include Lantana, Azaleas, Bougainvillea, Saponaria officinalis, Hesperis matronalis, Solidago, Lonicera japonica, and Asclepias incarnata. Along with flower nectar, adults can also consume liquid from animal waste.

Threats: There has been a northern expansion of the range of the giant swallowtail in recent years which has been linked to increasingly warm temperatures, and particularly to a lack of September frosts in regions of expansion starting in

2001. Larvae were then able to withstand a few frosts before they pupated. The immediate effects of this warming, as well as their effect on host plants and predators, can explain the giant swallowtail's range expansion.

Other Notes: It is the largest butterfly in North America. Males search for females along set flight paths and near host plants, and mate with females in the afternoon.

Pale Swallowtail (*Papilio eurymedon*)

Their appearance is very similar to that of the western tiger swallowtail, except they are a white-cream colour or very pale yellow. Some pale swallowtails also have differing amounts of red-orange patches on the top of the wings just above the tail. There is a submarginal band on the bottom of the hindwings. Tiger stripes and borders are thicker than those of western tiger swallowtails. The wingspan is typically 3.5 to 4.5 inches (8.9 to 11.4 cm).

Where is it found: A relatively common swallowtail butterfly found throughout much of the western North America. It is found on the Pacific coast from northern Baja California to southernmost British Columbia, and inland to New Mexico and the Black Hills of South Dakota. It is present from the coast to western Montana, and from Wyoming to northern New Mexico. It is absent from most of Nevada and western Utah. It prefers open woodlands and forest clearings, especially near permanent bodies of water such as ponds, but also urban parks and is occasionally seen in suburban areas.



Diet: Its host plants are members of the genus *Ceanothus*, including buckbrush, mountain balm, and mountain lilac, as well as red alder, ocean spray, bitter cherry, and serviceberry species.

Threats: Climate change poses serious threats to this species, both on its own and in conjunction with other stressors to species' populations.

Other Notes: Adults fly from April to October and are most common in May and July. Males perch and patrol for receptive females. Females lay eggs singly on host plant leaves.

Old World Swallowtail (*Papilio machaon*)

The butterfly is also known as the common yellow swallowtail or simply the swallowtail (a common name applied to all members of the family, but this species was the first to be given the name). The upperside of hindwing near tail has reddish-orange eyespot with black along lower border touching inner edge of hindwing or at least not a centered eyespot. It has a wingspan of 2 1/2 - 3 inches (6.5 - 7.5 cm).

Where is it found: This widespread species is found in much of the Palearctic (it is the only swallowtail in most of Europe) and in North America.



Diet: Sagebrushes (*Artemisia* species), including Arctic wormwood and wild tarragon, rarely plants in the parsley family.

Threats: Climate change poses serious threats to this species, both on its own and in conjunction with other stressors to species' populations.

Other Notes: There are 41 recognized subspecies:

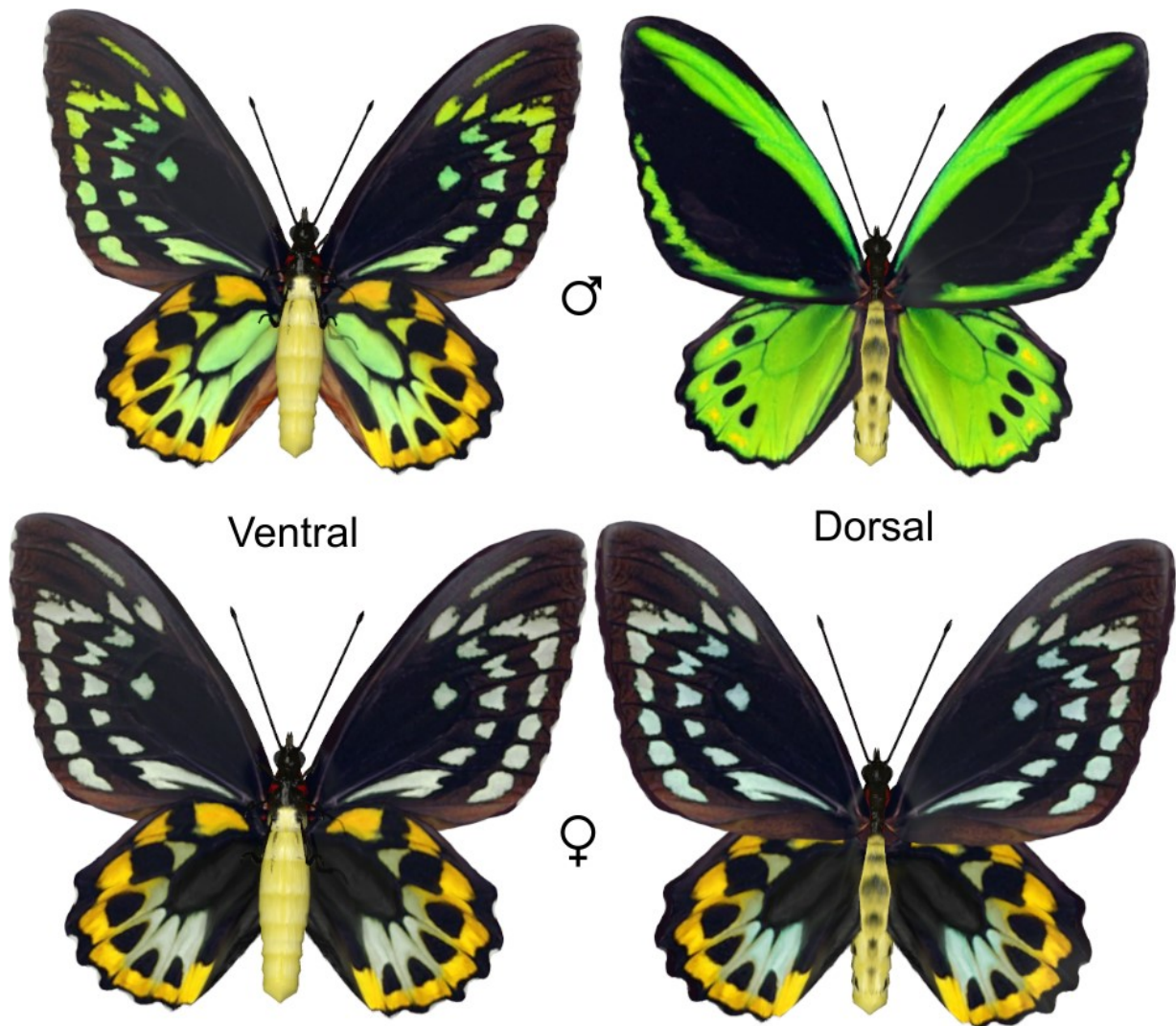
- *P. m. aliaska*. First reported by Scudder in 1869. Endemic to the Chukot Peninsula, Alaska to northern British Columbia.
- *P. m. annae*. First reported by Gistel in 1857.
- *P. m. archias*. First reported by Fruhstorfer, 1907. endemic to southern Sichuan, China.
- *P. m. asiaticus*. First reported by Ménétriés in 1855.
- *P. m. baijiangensis*. First reported by Huang & Murayama in 1992. Endemic to Xinjiang, China.
- *P. m. bairdii*. First reported by Edwards in 1866. Endemic from Nevada to Kansas, Arizona, Colorado.
- *P. m. birmanicus*. First reported by Rothschild in 1908. Endemic to southern Shan States.

- *P. m. britannicus*. First reported by Seitz in 1907. Endemic to Great Britain.
- *P. m. brucei*. First reported by Edwards in 1893. Endemic to Alberta, Saskatchewan to Nebraska to Utah.
- *P. m. centralis*. First reported by Staudinger in 1886. Found in Turan, western Tian-Shan, Ghissar, Darvaz, Alai, and western Pamirs.
- *P. m. chinensis*. First reported by Verity in 1905. Endemic to Sichuan, China.
- *P. m. gorganus*. First reported by Fruhstorfer in 1922. Endemic to southern Europe, Ural, Caucasus Major.
- *P. m. hippocrates*. First reported by C. & R. Felder in 1864. Endemic to Japan.
- *P. m. hudsonianus*. First reported by Clark in 1932. Endemic to Alberta to Quebec.
- *P. m. kamtschadalus*. First reported by Alphéraky in 1897. Endemic to Kamchatka, Russia.
- *P. m. kiyonobu*. First reported by Morita in 1997. Endemic to Tibet.
- *P. m. kunkalaschani*. First reported by Eller in 1939. Endemic to western Sichuan, China.
- *P. m. ladakensis*. First reported by Moore in 1884. Endemic to the eastern Pamirs.
- *P. m. lapponica*. First reported by Verity in 1911. Endemic to northern Europe.
- *P. m. machaon*. . Endemic to Central Europe.
- *P. m. mauretanica*. First reported by Verity in 1905. Endemic to North Africa.
- *P. m. maxima*. First reported by Verity in 1911.
- *P. m. melitensis*. First reported by Eller in 1936. Endemic to Malta.
- *P. m. montanus*. First reported by Alphéraky in 1897. Endemic to western Sichuan, south-western Gansu, eastern Qinghai, north-western Yunnan, China.
- *P. m. muetingi*. First reported by Seyer in 1976. Endemic to southern Arabia, United Arab Emirates.
- *P. m. neochinensis*. First reported by Sheljuzhko in 1913. Endemic to Tatsien-lu.
- *P. m. oregonius*. First reported by Edwards in 1876. Endemic to southern British Columbia to Oregon, Idaho.
- *P. m. oreinus*. First reported by Sheljuzhko in 1919. Endemic to Tian-Shan.
- *P. m. orientis*. First reported by Verity in 1911. Endemic to Altai, Sayan, Transbaikalia, northern Amur, Far East.
- *P. m. pikei*. First reported by Sperling in 1987. Endemic to Quebec, British Columbia.
- *P. m. sachalinensis*. First reported by Matsumura in 1911. Endemic to Sakhalin.
- *P. m. schapiroi*. First reported by Seyer in 1976. Endemic to southern Ussuri.
- *P. m. septentrionalis*. First reported by Verity in 1911. Endemic to Kurils.
- *P. m. sikkimensis*. First reported by Moore in 1884. Endemic to Tibet.
- *P. m. suroia*. First reported by Tytler in 1939. Endemic to Manipur, Assam, northeastern India.
- *P. m. sylvina*. First reported by Hemming in 1933. Endemic to Taiwan.

- *P. m. syriacus*. First reported by Verity in 1908. Endemic to Caucasus Minor, Armenia, Talysh Mountains.
- *P. m. taliensis*. First reported by Eller in 1939. Endemic to northern Yunnan.
- *P. m. ussuriensis*. First reported by Sheljuzhko in 1910. Endemic to southern Amur, northern and central Ussuri.
- *P. m. verityi*. First reported by Fruhstorfer in 1907. Endemic to northern Burma, Shan States, southern Yunnan.
- *P. m. weidenhofferi*. First reported by Seyer in 1976. Endemic to Kopet-Dagh.

Cairns Birdwing (*Ornithoptera euphorion*)

Males have a predominantly black upper wing with emerald green flashes, however the female lacks the green coloring, having a plain black upper wing with white patches. The female is the larger of the two sexes. The wingspan can be up to 5.9 inches (15 cm) in females, and 4.9 inches (12.5 cm) in males..



Where is it found: It is endemic to Queensland in Australia. They are found southwards from Mount Webb and Cooktown to Mackay in Queensland. It is also often seen in Cairns, hence its name.

Its favored habitat is rainforest of the Queensland wet tropics region, including riverine forest, and particularly near the coast.

Diet: It is attracted to the flowers of lantana, hibiscus and bougainvillea in suburban gardens.

Threats: The species is abundant throughout its range and is not threatened.

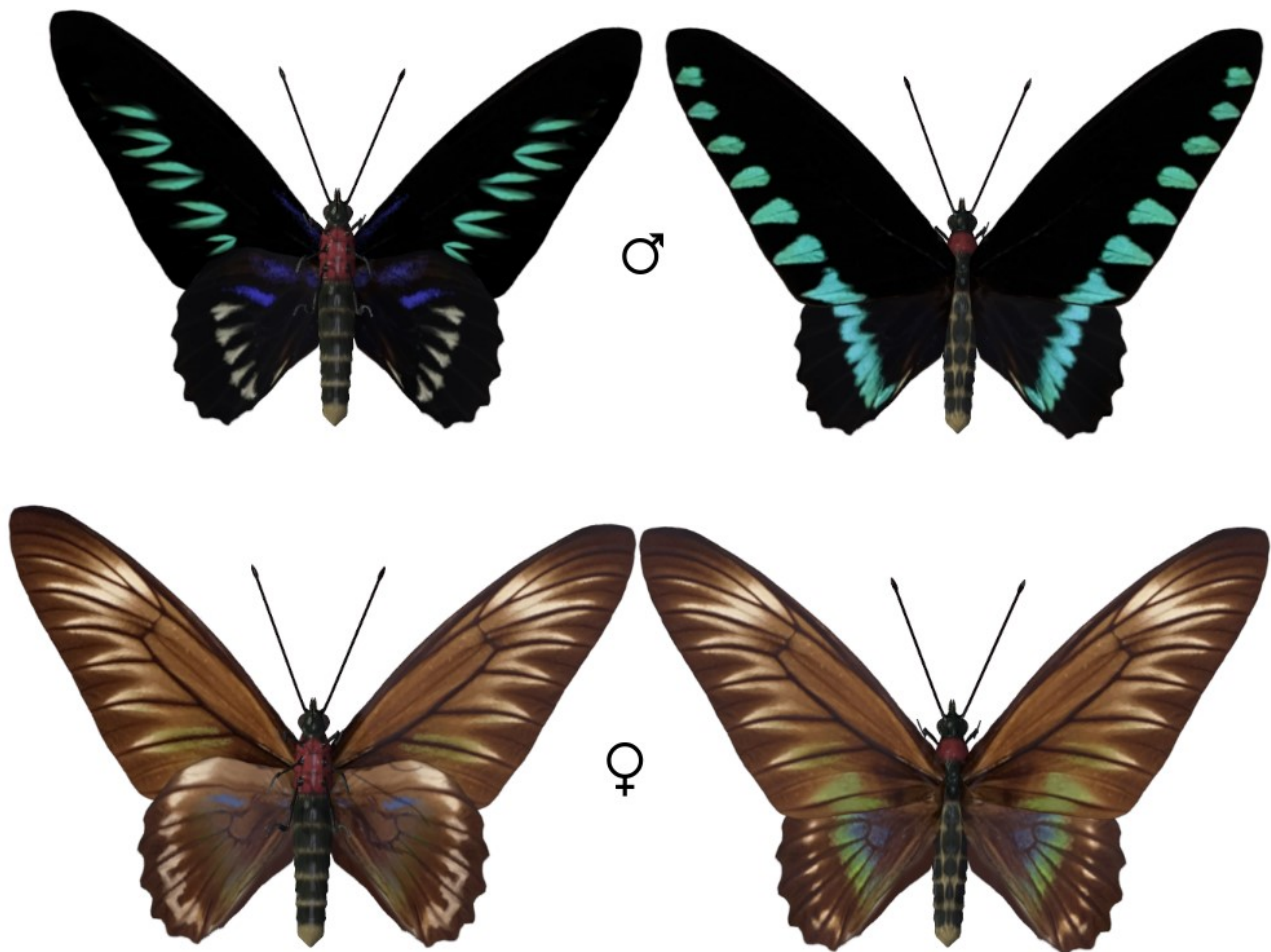
Other Notes: It is the largest butterfly species found in Australia.

Palawan Birdwing (*Trogonoptera trojana*)

It is a very large butterfly. The male has small metallic green triangle markings on wings. A blue sheen runs from the base of the wing upward meeting the metallic green halfway discally. The female is brown with tan markings following the veins. There is a faint blue and green sheen on the base of the forewing and center of the hind wing. The female is also larger than the male. They have a wingspan of 7.1–7.5 inches (18–19 cm).

Where is it found: It is endemic to Palawan in the Philippines.

It prefers woodlands and avoid open spaces.



Diet: They feed on the Aristolochia vine. This butterfly can congregate in large numbers along the riverbanks to drink.

Threats: This species is included in CITES Appendix II, restricting international export to those who have been granted a permit.

Other Notes: It is also called the Triangle Birdwing.

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
- **Cambridge Butterfly Conservatory** <https://www.cambridgebutterfly.com>
- **Butterfly Conservation** <https://butterfly-conservation.org>
- **US Fish and Wildlife** <https://www.fws.gov>
- **What's That Bug** <https://www.whatsthatbug.com>
- **Butterflies at Home** <https://www.butterfliesathome.com>

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