ALL ABOUT BUTTERFLY

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BUTTERFLY

Butterflies are part of the class of insects in the order Lepidoptera, along with the moths. Adult butterflies have large, often brightly coloured wings, and conspicuous, fluttering flight. The group comprises the large superfamily Papilionoidea, along with two smaller groups, the skippers (superfamily Hesperioidea) and the moth-butterflies (superfamily Hedyloidea). Butterfly fossils date to the Palaeocene, about 56 million years ago. Butterflies have the typical four-stage insect life cycle. Winged adults lay eggs on the food plant on which their larvae, known as caterpillars, will feed. The caterpillars grow, sometimes very rapidly, and when fully developed pupate in a chrysalis. When metamorphosis is complete the pupa skin splits, the adult insect climbs out and, after its wings have expanded and dried, it flies off. Some butterflies, especially in the tropics, have several generations in a year, while others have a single generation, and a few in cold locations may take several years to pass through their whole life cycle. Butterflies are often polymorphic, and many species make use of camouflage, mimicry and aposematism to evade their predators. Some, like the Monarch, migrate over long distances. Some butterflies have parasitic relationships with organisms including protozoans, flies, ants, other invertebrates, and vertebrates. Some species are pests because in their larval stages they can damage domestic crops or trees; however, some species are agents of pollination of some plants, and caterpillars of a few butterflies (e.g., harvesters) eat harmful insects. Culturally, butterflies are a popular motif in the visual and literary arts.
LIFE CYCLE OF A BUTTERFLY

1. Egg
2. Larva (caterpillar)
3. Pupa (chrysalis)
4. Adult butterfly
A butterfly has four stages in their life cycle:

- Egg
- Caterpillar (larva)
- Pupa (chrysalis)
- Butterfly
Butterflies in their adult stage can live from a week to nearly a year depending on the species. Many species have long larval life stages while others can remain dormant in their pupa or egg stages and thereby survive winters. The Melissa Arctic (Oeneis melissa) overwinters twice as a caterpillar. Butterflies may have one or more broods per year. The number of generations per year varies from temperate to tropical regions with tropical regions showing a trend towards multivoltinism. The vast majority of butterflies have a four stage life cycle; egg, larva (caterpillar), pupa (chrysalis) and imago (adult). However, in the genera Colias, Erebia, Euchloe and Parnassius, a small number of species are known that reproduce semi-parthenogenetically; when the female dies, a partially developed larva emerges from her abdomen.
Butterfly eggs are protected by a hard-ridged outer layer of shell, called the chorion. This is lined with a thin coating of wax which prevents the egg from drying out before the larva has had time to fully develop. Each egg contains a number of tiny funnel-shaped openings at one end, called micropyles; the purpose of these holes is to allow sperm to enter and fertilize the egg. Butterfly eggs vary greatly in size and shape between species, but are usually upright and finely sculptured. Some species lay eggs singly, others in batches. Many females produce a total of between one hundred and two hundred eggs.
Butterfly larvae, or caterpillars, consume plant leaves and spend practically all of their time in searching for and eating food. Although most caterpillars are herbivorous, a few species are predators: Spalgis epius eats scale insects, while lycaenids such as Liphyra brassolis are myrmecophilous, eating ant larvae.
PUPA

When the larva is fully grown, hormones such as prothoracicotropic hormone (PTTH) are produced. At this point the larva stops feeding and begins "wandering" in the quest for a suitable pupation site, often the underside of a leaf or other concealed location. There it spins a button of silk which it uses to fasten its body to the surface and moults for a final time. While some caterpillars spin a cocoon to protect the pupa, most species do not. The naked pupa, often known as a chrysalis, usually hangs head-down from the cremaster, a spiny pad at the posterior end, but in some species a silken girdle may be spun to keep the pupa in a head-up position. Most of the tissues and cells of the larva are broken down inside the pupa, as the constituent material is rebuilt into the imago. The structure of the transforming insect is visible from the exterior, with the wings folded flat on the ventral surface and the two halves of the proboscis, the antennae and the legs between them.
The reproductive stage of the insect is the winged adult or imago. The surface of both butterflies and moths is covered by scales, each of which is an outgrowth from a single epidermal cell. The head is small and dominated by the two large compound eyes. These are capable of distinguishing flower shapes or motion but not for clearly viewing distant objects. Colour perception is good, especially in some species in the blue/violet range. The antennae are composed of many segments and have clubbed-tips (unlike moths that have tapering or feathery antennae). The sensory receptors are concentrated in the tips and can detect odours. Taste receptors are located on the palps and on the feet. The mouthparts are designed for sucking and the mandibles are usually reduced in size or absent. The first maxillae are elongated into a tubular proboscis which is curled up at rest and expanded when needed to feed. The first and second maxillae bear palps which function as sensory organs. Some species have a reduced proboscis or maxillary palps and do not feed as adults.
Egg. "Dome-shaped, smooth or obscurely facetted, not as high as wide, somewhat leathery, opaque." (Doherty.)

Larva. Stout, smooth or with a series of fleshy tubercles on the dorsum: sometimes with a raised fleshy protuberance (the so-called hood or crest) on the fourth segment. The second segment has a transverse opening, out of which the larva protrudes at will and an erect, forked, glandular fleshy organ that emits a strong, penetrating, and somewhat pleasant odor.

Pupa. Variable in form but most often curved backwards. It is angulate, with the head truncate or rounded and the back of abdomen is smooth or tuberculate. It is attached by the tail, normally in a perpendicular position, and further secured by a silken girth round the middle. In Parnassius, the pupa is placed in a loose silken web between leaves.

Adult. Wings extraordinarily variable in shape. Hind wing very frequently has a tail, which may be slender, or broad and spatulate, but is always an extension of the termen at vein 4. In one genus, Armandia, the termen of the hind wing is prolonged into tails at the apices of veins 2 and 3 as well as at vein 4. Pore wing (except in the aberrant genera Parnassius and Hypermenestra) with all 12 veins present and in addition a short internal vein, vein 1 a,[11] that invariably terminates on the dorsal margin.
SPECIES OF BUTTERFLIES

There are approximately 20,000 species of butterflies in the world. About 725 species have occurred in North American north of Mexico, with about 575 of these occurring regularly in the lower 48 states of the United States, and with about 275 species occurring regularly in Canada.
Swallowtail butterflies 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. The family includes the largest butterflies in the world, the birdwing butterflies of the genus Ornithoptera. Swallowtails have a number of distinctive features; for example, the papilionid caterpillar bears a repugnatorial organ called the osmeterium on its prothorax. The osmeterium normally remains hidden, but when threatened, the larva turns it outward through a transverse dorsal groove by inflating it with fluid. The forked appearance of the swallowtails' hind wings, which can be seen when the butterfly is resting with its wings spread, gave rise to the common name swallowtail. As for its formal name, Linnaeus chose Papilio for the type genus, as Papilio is Latin for 'butterfly'. For the specific epithets of the genus, Linnaeus applied the names of Greek heroes to the swallowtails. The type species: Papilio machaon honoured Machaon, one of the sons of Asclepius, mentioned in the Iliad.
A blue morpho butterfly is one of over 29 accepted species and 147 accepted subspecies of butterflies in the genus Morpho. They are neotropical butterflies found mostly in South America, Mexico, and Central America. Morphos range in wingspan from the 7.5-cm (3-in) M. rhodopteron to the imposing 20-cm (8-in) sunset morpho, M. hecuba. The name morpho, meaning changed or modified, is also an epithet of Aphrodite and Venus.
MONARCH BUTTERFLY

The monarch butterfly (Danaus plexippus) is a milkweed butterfly (subfamily Danainae) in the family Nymphalidae. It may be the most familiar North American butterfly, and is considered an iconic pollinator species.[3] Its wings feature an easily recognizable black, orange, and white pattern, with a wingspan of 8.9–10.2 cm (3½–4 in). Its wings feature an easily recognizable black, orange, and white pattern, with a wingspan of 8.9–10.2 cm (3½–4 in). The viceroy butterfly is similar in color and pattern, but is markedly smaller and has an extra black stripe across each hind wing. The eastern North American monarch population is notable for its annual southward late-summer/autumn migration from the United States and southern Canada to Mexico. During the fall migration, monarchs cover thousands of miles, with a corresponding multi-generational return north. The western North American population of monarchs west of the Rocky Mountains often migrates to sites in California but has been found in overwintering Mexican sites as well. Monarchs were transported to the International Space Station and were bred there.
PAINTED LADY BUTTERFLY

The Cynthia group of colourful butterflies, commonly called painted ladies, comprises a subgenus of the genus Vanessa in the Family Nymphalidae. They are well known throughout most of the world.
LONG TAILED SKIPPER BUTTERFLY

The long-tailed skipper (Urbanus proteus) is a spread-winged skipper butterfly found throughout tropical and subtropical South America, south to Argentina and north into the southern part of the United States of America. It cannot live in areas with prolonged frost. It is a showy butterfly, with wings of light brown tinted with iridescent blue, and two long tails extending from the hindwings. The robust body is light blue dorsally. It has a large head, prominent eyes, and a wingspan between 4.5 and 6 centimeters.
The Eastern tiger swallowtail (Papilio glaucus) is a species of swallowtail butterfly native to eastern North America. It is one of the most familiar butterflies in the eastern United States, where it is common in many different habitats. It flies from spring to fall, during which it produces two to three broods. Adults feed on the nectar of many species of flowers, mostly from those of the Apocynaceae, Asteraceae, and Fabaceae families. P. glaucus has a wingspan measuring 7.9 to 14 cm (3.1 to 5.5 in). The male is yellow with four black "tiger stripes" on each fore wing. Females may be either yellow or black, making them dimorphic. The yellow morph is similar to the male, but with a conspicuous band of blue spots along the hindwing, while the dark morph is almost completely black. The green eggs are laid singly on plants of the Magnoliaceae and Rosaceae families. Young caterpillars are brown and white; older ones are green with two black, yellow, and blue eyespots on the thorax. The caterpillar will turn brown prior to pupating. It will reach a length of 5.5 centimeters (2.2 in). The chrysalis varies from a whitish color to dark brown. Hibernation occurs in this stage in locations with cold winter months.
SILVERY BLUE BUTTERFLY

The Silvery Blue (Glaucopsyche lygdamus) is a small butterfly native to North America. Upperside is a light blue in males, a dull grayish blue in females. Underside is gray with single row of round spots of differing sizes depending upon region. G. lygdamus is found over much of the western United States and most of Canada extending north excepting most of Nunavut and the high Arctic islands. Wingspan is from 18 to 28 mm.
The Palos Verdes Blue (Glaucopsyche lygdamus palosverdesensis) is a small endangered butterfly native to the Palos Verdes Peninsula in southwest Los Angeles County, California. As its distribution has been proven to be limited to one single site it has one of the best claims to being the world's rarest butterfly.
The Orange Sulphur (Colias eurytheme), also known as the Alfalfa Butterfly and in its larval stage as Alfalfa Caterpillar, is a butterfly of the family Pieridae, where it belongs to the lowland group of "clouded yellows and sulphurs" subfamily Coliadinae. It is found throughout North America from southern Canada to Mexico, but is absent from the central and southeastern USA. Other members of this lineage including the Common or Clouded Sulphur (C. philodice) and Colias eriphyle and Colias vitabunda that are often included in C. philodice as subspecies. Hybridization runs rampant between these, making phylogenetic analyses exclusively utilizing one type of data (especially mtDNA sequences) unreliable. Therefore little more can be said about its relationships, except that it is perhaps closer to C. (p.) eriphyle than generally assumed, strengthening the view that the latter should be considered a good species. The Orange Sulphur's caterpillars feed off various species in the pea family (Fabaceae) and are usually only found feeding at night. Occasionally this species multiplies to high numbers, and can become a serious pest to Alfalfa (Medicago sativa) crops.
Ornithoptera priamus, commonly known as the common green birdwing, Cape York Birdwing, Priam's Birdwing or Northern Birdwing, is a widespread species of birdwing butterfly found in the central and south Moluccas, New Guinea, Bismarck Archipelago, Solomon Islands, and northeast Australia.
The Glass winged butterfly (Greta oto) is a brush-footed butterfly, and is a member of the subfamily Danaidae, tribe Ithomiini, subtribe Godyridina. G. oto adults also exhibit a number of interesting behaviors, such as long migrations and lekking among males.
Sasakia charonda, commonly known as the Japanese emperor or the great purple emperor, is a species of butterflies in the family Nymphalidae. It is native to Japan (from Hokkaidō to Kyūshū), the Korean Peninsula, China, Northern Taiwan, Northern Vietnam. Their wingspans average at 50 mm (2.0 in) for males, and 65 mm (2.6 in) for females. They are common in the upper canopies of forests, only coming down to feed or to find salt sources. The larvae of the species feed on hackberries, like Celtis jessoensis, Celtis japonica, and Celtis sinensis.
BRUSH FOOTED BUTTERFLY

The Nymphalidae are the largest family of butterflies with about 6,000 species distributed throughout most of the world. These are usually medium-sized to large butterflies. Most species have a reduced pair of forelegs and many hold their colourful wings flat when resting. They are also called brush-footed butterflies or four-footed butterflies, because they are known to stand on only four legs while the other two are curled up; in some species these forelegs have a brush-like set of hairs which gives this species its other common name. Many species are brightly coloured and include popular species such as the emperors, Monarch butterfly, admirals, tortoiseshells, and fritillaries. However, the underwings are, in contrast, often dull and in some species look remarkably like dead leaves, or are much paler, producing a cryptic effect that helps the butterflies disappear into their surroundings.
Milkweed butterflies are a subfamily, Danainae, in the family Nymphalidae, or brush-footed butterflies. They lay their eggs on various milkweeds on which their larvae (caterpillars) feed. Historically, this group had been considered a separate family, Danaiidae. Some 300 species of Danainae exist worldwide. Most of the Danaini are found in tropical Asia and Africa, while the Ithomiini are diverse in the Neotropics. Tellervini are restricted to Australia and the Oriental region. Four species are found in North America: the Monarch butterfly (Danaus plexippus), the Queen (Danaus gilippus), the tropical milkweed butterfly (Lycorea cleobaea), and the soldier butterfly (or "tropic queen", Danaus eresimus).
Argynnis hyperbius, the Indian fritillary, is a butterfly of the Nymphalid or brush-footed butterfly family.
The Red Admiral (Vanessa atalanta) is a well-known colourful butterfly, found in temperate Europe, Asia and North America. The Red Admiral has a 45–50 mm (1.8–2.0 in) wing span. The species is resident only in warmer areas, but migrates north in spring, and sometimes again in autumn. This medium-sized butterfly is identified by its striking dark brown, red, and black wing pattern. More specifically, the dark wings possess orange bands that cross the fore wings and on the outer edge of the hind wings; white spots on the dorsal fore wings near the front margin; reddish bars on dorsal surface of all four wings. The caterpillar feeds on nettles, and the adult drinks from flowering plants like the Buddleia and overripe fruit. In northern Europe, it is one of the last butterflies to be seen before winter sets in, often feeding on the flowers of ivy on sunny days. The Red Admiral is also known to hibernate, re-emerging individuals showing prominently darker colourings than first brood subjects. The butterfly also flies on sunny winter days, especially in southern Europe. In North America, the Red Admiral generally has two broods from March through October. Most of North America must be recolonized each spring by southern migrants, but this species over-winters in south Texas. The Red Admiral is the butterfly featured by Vladimir Nabokov, an amateur lepidopterist, in his novel Pale Fire.
Gonepteryx rhamni (known as the common brimstone) is a butterfly of the Pieridae family. It lives in Europe, North Africa and Asia. Across much of its range, it is the only species of its genus, and is therefore simply known locally as the brimstone. The name "butterfly" is believed to have originated from the brimstone — which was called the butter-coloured fly by early British naturalists.