

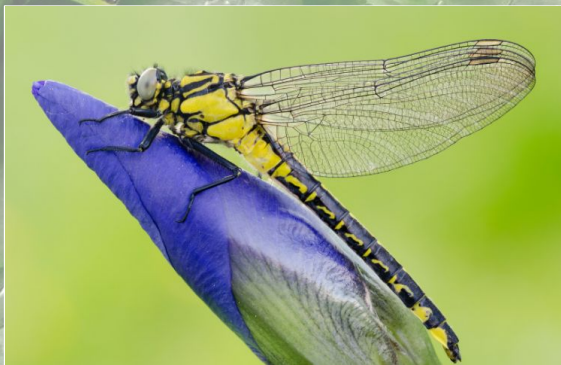
# DRAGONFLIES











**dragonfly - стрекоза**

[ 'drægənflaɪ ]



**hawker dragonfly**  
- штопальщица

[ 'hɔ:kə 'drægənflaɪ ]



**club-tailed dragonfly**  
- косохвостая стрекоза

[ klʌb-teɪld 'drægənflaɪ ]



**petaltails** - лепестковая  
стрекоза

[petaltails]



**flying adder** -  
булавобрюхая стрекоза

['flaɪŋ 'ædə]



**green-eyed skimmer** -  
изумрудная стрекоза

[grɪ:n-aɪd 'skɪmə]





**percher** -  
плоскобрюхая стрекоза

[percher]



**cruiser** - стрекоза-  
скиммер

['kru:zə]



**southern emerald** -  
стрекоза-тигрохвост

['sʌðən 'emərəld]

# Dragonfly





A **dragonfly** is an insect belonging to the order Odonata, infraorder Anisoptera (from Greek ἄνισος anisos, "unequal" and πτερόν pteron, "wing", because the hindwing is broader than the forewing). Adult dragonflies are characterized by large, multifaceted eyes, two pairs of strong, transparent wings, sometimes with coloured patches, and an elongated body. Dragonflies can be mistaken for the related group, damselflies, which are similar in structure, though usually lighter in build; however, the wings of most dragonflies are held flat and away from the body, while damselflies hold their wings folded at rest, along or above the abdomen. Dragonflies are agile fliers, while damselflies have a weaker, fluttery flight. Many dragonflies have brilliant iridescent or metallic colours produced by structural colouration, making them conspicuous in flight. An adult dragonfly's compound eyes have nearly 24,000 ommatidia each.

Fossils of very large dragonfly ancestors in the Protodonata are found from 325 million years ago in Upper Carboniferous rocks; these had wingspans up to about 750 mm. About 3,000 extant species are known. Most are tropical, with fewer species in temperate regions. Loss of wetland habitat threatens dragonfly populations around the world.

Dragonflies are predators, both in their aquatic larval stage, when they are known as nymphs or naiads, and as adults. In some species, the nymphal stage lasts for up to five years, and the adult stage may be as long as ten weeks, but most species have an adult lifespan in the order of five weeks or less, and some survive for only a few days.

They are fast, agile fliers, sometimes migrating across oceans, and often live near water. They have a uniquely complex mode of reproduction involving indirect insemination, delayed fertilization, and sperm competition. During mating, the male grasps the female at the back of the head, and the female curls her abdomen under her body to pick up sperm from the male's secondary genitalia at the front of his abdomen, forming the "heart" or "wheel" posture.

Dragonflies are heavy-bodied, strong-flying insects that hold their wings horizontally both in flight and at rest. By contrast, damselflies have slender bodies and fly more weakly; most species fold their wings over the abdomen when stationary, and the eyes are well separated on the sides of the head.

An adult dragonfly has three distinct segments, the head, thorax, and abdomen, as in all insects. It has a chitinous exoskeleton of hard plates held together with flexible membranes. The head is large with very short antennae. It is dominated by the two compound eyes, which cover most of its surface. The compound eyes are made up of ommatidia, the numbers being greater in the larger species. *Aeshna interrupta* has 22650 ommatidia of two varying sizes, 4500 being large. The facets facing downward tend to be smaller. *Petalura gigantea* has 23890 ommatidia of just one size. These facets provide complete vision in the frontal hemisphere of the dragonfly. The compound eyes meet at the top of the head. Also, they have three simple eyes or ocelli.



The mouthparts are adapted for biting with a toothed jaw; the flap-like labrum, at the front of the mouth, can be shot rapidly forward to catch prey. The head has a system for locking it in place that consists of muscles and small hairs on the back of the head that grip structures on the front of the first thoracic segment. This arrester system is unique to the Odonata, and is activated when feeding and during tandem flight.

Many adult dragonflies have brilliant iridescent or metallic colours produced by structural colouration, making them conspicuous in flight. Their overall colouration is often a combination of yellow, red, brown, and black pigments, with structural colours. Blues are typically created by microstructures in the cuticle that reflect blue light. Greens often combine a structural blue with a yellow pigment. Freshly emerged adults, known as teneral, are often pale-coloured and obtain their typical colours after a few days, some have their bodies covered with a pale blue, waxy powderiness called pruinosity; it wears off when scraped during mating, leaving darker areas.

The wings of dragonflies are generally clear, apart from the dark veins and pterostigmata. In the chasers, however, many genera have areas of colour on the wings: for example, groundlings have brown bands on all four wings, while some scarlets and dropwings have bright orange patches at the wing bases.

## Hawker dragonfly





The Aeshnidae, also called **aeshnids**, **hawkers**, or **darners**, is a family of dragonflies. The family includes the largest dragonflies found in North America and Europe and among the largest dragonflies on the planet.

Common worldwide or nearly worldwide genera are Aeshna and Anax. The African Anax tristis has a wingspan over 125 mm, making it one of the world's largest known dragonflies.

The 41 North American species in 11 genera are represented in this family. Most European species belong to Aeshna. Their American name "darner" stems from the female abdomens looking like a sewing needle, as they cut into plant stem when they lay their eggs through the ovipositor.

The dragonflies mate in flight. The eggs are deposited in water or close by. The larvae (nymphs or naiads) are generally slender compared to those of other families, with a long and flat extensible lower lip (labium). The larvae are aquatic predators, feeding on other insects and even small fish.

The adults spend large amounts of time in the air and seem to fly tirelessly with their four large and powerful wings. They can fly forwards or backwards or hover like a helicopter. The wings are always extended horizontally.

**Their abdomens are long and thin. Most are colored blue and or green, with black and occasionally yellow. Their large, hemispherical, compound eyes touch in the midline and nearly cover their heads. They have an extremely good sight, and are voracious insect predators, using their sharp, biting mouthparts. They are, therefore, very beneficial.**

**All are extremely hard to catch because of their flying abilities and keen sight.**

**A proposal has been made to split this family into Aeshnidae and Telephlebiidae.**

**The name may have resulted from a printer's error in spelling the Greek Aechma, "a spear". The spelling Aeschnidae has been intermittently used over a period of time, but is now abandoned for the original name Aeshnidae. However, derived genus names (such as Rhionaeschna) retain the 'sch' spelling, as this is how they were first cited.**



## Club-tailed dragonfly



The Gomphidae are a family of dragonflies commonly referred to as **clubtails** or **club-tailed dragonflies**. The family contains about 90 genera and 900 species found across North and South America, Europe, Asia, and Australia. The name refers to the club-like widening of the end of the abdomen (abdominal segments 7 through 9). However, this club is usually less pronounced in females and is entirely absent in some species.

Clubtails have small, widely separated compound eyes, a trait they share with the Petaluridae and with damselflies. The eyes are blue, turquoise, or green. The thorax in most species is pale with dark stripes, and the pattern of the stripes is often diagnostic. They lack the bright metallic colors of many dragonfly groups and are mostly cryptically colored to avoid detection and little difference between the sexes is seen. Adults are usually from 40 to 70 mm in length; there are 6 specific variations that are native to Africa alone, and vary from 33 to 40 mm in length.

Clubtails are fast-flying dragonflies with short flight seasons. They spend much time at rest, perching in a suitable position to dart forth to prey on flying insects. They tend to perch on the ground or on leaves with the abdomen sloping up and its tip curling down a little. Larger species may perch with a drooping abdomen or lie flat on a leaf. Another stance adopted by clubtails perching in the open is "obelisking", standing with the abdomen raised vertically, a posture adopted otherwise only by the skimmers.



Most clubtails breed in streams, rivers, or lakes. The nymphs are unusual in having a flat mentum, part of the mouthparts, and their antennae have only four segments. They burrow in the sediment at the bottom of the water body, with the nymphs of the dragonhunter living among damp bark and leaf litter at the edge of the water.[4] Some larvae variations actually differ from this typical burrowing. Some will only come out during daytime, which differs from the predominant nighttime emergence. Some larvae also will lay on flat surfaces, whereas most larvae prefer a vertical-type surface.

## Petaltails





The **petaltails** of the family Petaluridae are apparently the most ancient of the extant true dragonflies, having fossil members from as early as the Jurassic (over 150 million years ago).

Modern petalurids include only 11 species, one of which, the Australian *Petalura ingentissima*, is the largest of living dragonflies, having a wingspan of up to 160 mm and a body length of over 100 mm. Other Australian species include *Petalura gigantea* (commonly known as the giant dragonfly). In the United States, two species are found, one on either coast. The larvae live primarily in stream banks, mostly in burrows, but the larvae of the eastern US species, *Tachopteryx thoreyi*, the gray petaltail, live in depressions under wet leaves. The semiaquatic habitat of the larvae makes the petaltails unique in the modern dragonfly families.

## Flying adder





The Cordulegastridae are a family of Odonata (dragonflies) from the suborder Anisoptera. They are commonly known as **spiketails**. Some vernacular names for the species of this family are **biddie** and **flying adder**. They have large, brown or black bodies with yellow markings, and narrow unpatterned wings. Their bright eyes touch at a single point, and they can be found along small, clear, woodland streams, flying slowly 30 to 70 cm above the water. When disturbed, however, they can fly very rapidly. They usually hunt high in forest vegetation, and prefer to capture prey resting on leaves or branches (known as gleaning).

The Cordulegastridae usually lay their eggs in the sand in shallow water, the female hovering just above the water with her body in a vertical position, and making repeated dips into the water with her abdomen.

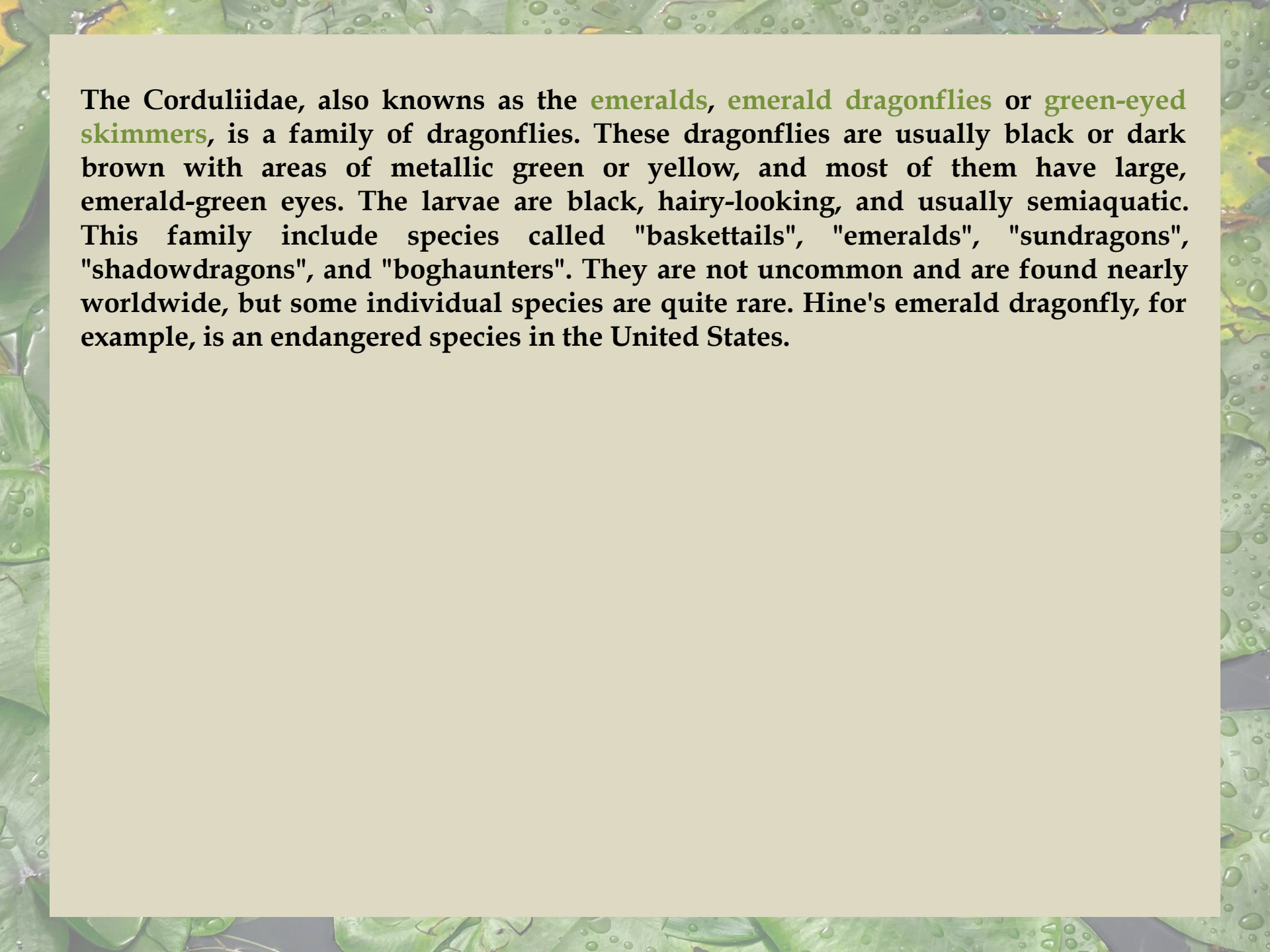
The family is distributed worldwide; all eight species in North America belong to the genus *Cordulegaster*.

The name Cordulegastridae comes from the Greek *kordylinus*, 'club-shaped' and *gaster*, belly. The common name spiketails refers to the females' prominent ovipositors.

## Green-eyed skimmer







The Corduliidae, also known as the **emeralds**, **emerald dragonflies** or **green-eyed skimmers**, is a family of dragonflies. These dragonflies are usually black or dark brown with areas of metallic green or yellow, and most of them have large, emerald-green eyes. The larvae are black, hairy-looking, and usually semiaquatic. This family includes species called "baskettails", "emeralds", "sundragons", "shadowdragons", and "boghaunters". They are not uncommon and are found nearly worldwide, but some individual species are quite rare. Hine's emerald dragonfly, for example, is an endangered species in the United States.

## Percher





The **skimmers** or **perchers** and their relatives form the Libellulidae, the largest dragonfly family in the world. It is sometimes considered to contain the Corduliidae as the subfamily Corduliinae and the Macromiidae as the subfamily Macromiinae. Even if these are excluded, there still remains a family of over 1000 species. With nearly worldwide distribution, these are almost certainly the most often seen of all dragonflies.

The genus *Libellula* is mostly New World, but also has one of the few endangered odonates from Japan: *Libellula angelina*. Many of the members of this genus are brightly colored or have banded wings. The related genus *Plathemis* includes the whitetails. The genus *Celithemis* contains several brightly marked species in the southern United States. Members of the genus *Sympetrum* are called darters (or meadowhawks in North America) and are found throughout most of the world, except Australia. Several Southern Hemisphere species in the genera *Trithemis* and *Zenithoptera* are especially beautiful. Other common genera include *Tamea* and *Pantala*.

The libellulids have stout-bodied larvae with the lower lip or labium developed into a mask over the lower part of the face.

## Cruiser





The insect family Macromiidae contains the dragonfly species known as **cruisers** or **skimmers**. They tend to fly over bodies of water (and roads) straight down the middle. They are similar to Aeshnidae in size, but the eyes are green and just barely meet at the top of the head.

Macromiidae, or Macromiinae, has been traditionally considered as a subfamily of Corduliidae. It contains four genera and 125 species worldwide.

Females of this family lack an ovipositor at the end of the abdomen and lay their eggs by dipping the abdomen in the water as they fly over. Ovipositing is usually done without a male.

The Naiads hatch after two weeks and are born with three gills for respiration.

Naiads are found in rivers, streams, and lakes where there is water movement. They crawl in debris at the water's bottom and wait for prey. They mostly eat mosquito larvae, freshwater shrimp, fish and tadpoles.

## Southern emerald





The Synthemistidae are the family of dragonflies commonly known as **tigertails**, or sometimes called **southern emeralds**. This family has seven genera and forty-three species; they look similar to corduliid and gomphid dragonflies. This family is sometimes treated as a subfamily of Corduliidae. This is an ancient dragonfly family, with some species occurring in Australia and New Guinea. Most species are small in size and have narrow abdomens. Their nymphs are bottom dwellers, and resist droughts by burying themselves very deeply. Synthemistid dragonflies frequently prefer marshy areas, as well as fast-flowing streams. The family Synthemistidae is sometimes called Synthemidae.