

Welcome
to the
Museum

ADMIT ALL



Insectarium

Curated by EMILY CARTER and DAVE GOULSON



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INSECTARIUM

Gallery 1

Ancient Insects



Dragonflies, Damselflies and Mayflies

Cockroaches and Termites

Mantises

Grasshoppers and Crickets

Stick Insects and Earwigs

Habitat: Ponds, Streams and Rivers

Dragonflies, Damselflies and Mayflies

The ancestors of dragonflies were the first creatures on Earth to fly, around 380 million years ago. On hazy summer days it is not uncommon to see dragonflies and damselflies (Odonata) and their cousins the mayflies (Ephemeroptera) flitting across a pond or river, their wings catching the sunlight. Dragonflies zoom at high speed, damselflies flit furtively along the banks, while mayflies hover in swarms over the water. There are about 5,600 species of dragonfly and damselfly, and 3,100 species of mayfly.

Dragonflies are attractive, large and colourful insects, distinguishable by the way they hold their wings at right angles to their body when resting. Damselflies tend to be more slender and fold their wings behind their backs when resting. Both are active during the day and use their excellent eyesight to spot smaller flying insects which they catch with their legs, and often consume mid-air.

Dragonflies lay their eggs in water and the aquatic nymphs emerge as plain brown creatures. They are ambush predators, waiting motionless until their prey comes close. Then, using jaws mounted on a telescopic 'mask', their mouthparts shoot out to capture insects, tadpoles or even small fish. Development can take several years, but when fully grown the nymphs haul themselves out of the water, often using plant stems. The nymph sheds its aquatic exoskeleton, emerging into its impressive winged form. Discarded old, brown skins are a common sight around pond edges.

Compared to dragonflies, mayflies are rather feeble fliers. Their nymphs are also aquatic and tend to graze on algae. The adults are famously very short-lived, lasting from just a few hours to a few days. Incredibly they do not feed; indeed, they do not even have a mouth. Their sole job is to mate, disperse and lay eggs. Because of the short lifespan of the adult, many thousands of mayflies tend to emerge at once, usually on a day in late spring or summer. They can form huge shimmering swarms which rise and fall above the water. The males race to mate with females as soon as they emerge.

Key to plate

1: Emperor dragonfly

Anax imperator
Wingspan: Up to 110mm
This dragonfly tends to fly quite high and fast, and spends most of its time hunting for larger insects such as butterflies and damselflies.

2: Helicopter damselfly

Megalopterus caeruleus
Wingspan: Up to 190mm
The largest of the damselflies, this insect specialises in plucking orb-weaver spiders, or their prey, from webs.

3: Broad-bodied chaser (male)

Libellula depressa
Wingspan: Up to 70mm
This broad dragonfly has 'sexual dimorphism' which means the sexes look quite different. The males are pale blue and the females are brown and yellow.

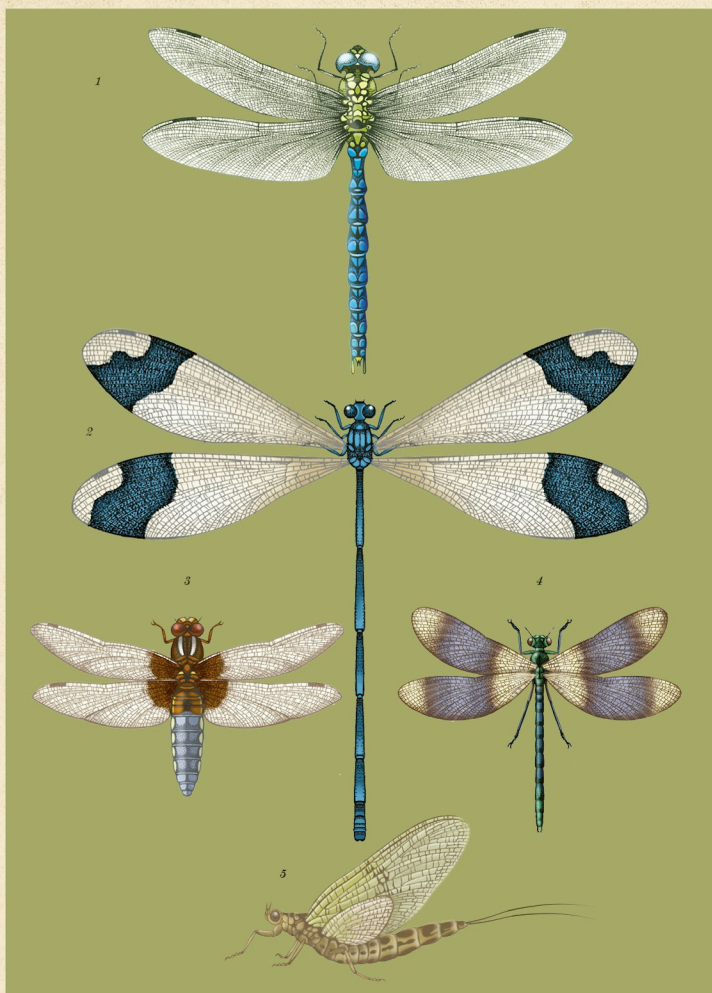
4: Beautiful demoiselle (male)

Calopteryx virgo
Wingspan: Up to 70mm
This damselfly is so named because of its iridescent colouration. The male has

a metallic blue-green body and dark wings while the female has a green body and brown wings.

5: Green drake mayfly

Ephemera danica
Wingspan: Up to 80mm
One of the larger mayfly species, the green drake mayfly larvae is a filter feeder, sieving fine organic particles from the water. Mayflies are very sensitive to water pollution, and are often used as an indicator of water quality.



Cockroaches and Termites

There are about 8,500 known species of Dictyoptera worldwide, mostly large, weak-flying insects which lay batches of eggs in protective cases called an ootheca. The group is made up of cockroaches, termites and mantises.

Cockroaches are a tough and adaptable bunch; it is often suggested that they will long outlast us humans. Despite generally being considered unwelcome household pests, the large majority of cockroach species are harmless creatures that live in the wild. They are particularly common in forests where they feed mainly on dead and decaying plant material, helping to recycle the nutrients.

Some cockroaches are sociable creatures preferring to live in groups. Some have even evolved into ant-like termites. Termites are known as eusocial insects (along with ants, bees and wasps), meaning that they live in colonies in which reproduction is carried out by a few specialist individuals (queens) and most individuals are workers which never have their own offspring. Incredibly, termite queens can lay up to 7,000 eggs in a single day, and can live for 50 years or more, making them the longest-lived insect that we know of. They are also likely to hold the record for the most offspring, perhaps laying more than 100 million eggs in their lifetime, although no-one has ever counted. A single colony may have several million workers at any one time.

Termites are remarkable creatures in many ways, not least because they have a special stomach filled with symbiotic microbes that help them to digest the dead leaves and wood they eat. This means they play an important role in recycling nutrients in the soil. However, just as cows release methane (a powerful greenhouse gas) as they ferment plant material in their stomach, so do termites. They are estimated to produce about 10 per cent of all atmospheric methane.

Key to plate

1a: Magnetic termite

Amitermes meridionalis
Length: Up to 6mm
Found in Northern Australia, this termite species is tiny and almost blind.

1b: Magnetic termite mound

Termite nests are made of mud, wood or their own faeces. The mounds can be over 10 metres tall and are built with air ducts that act like air-conditioning systems. The magnetic termite builds flattened, grave-stone-like mounds up to 4 metres tall that are always aligned north-south, so that only a narrow edge is facing the sun during the hottest part of the day.

2: Suicide bomber termite

Necopitomyces torosus
Length: Up to 8mm
Termites have many natural predators,

including ants. Most termite species have a soldier caste – individuals with large jaws who defend the nest. In this species, old workers develop bluish sacs inside their body containing poison. When attacked these termites burst open, killing themselves in the process but releasing a toxic goo that can also kill many of their enemies.

3: American cockroach

Periplaneta americana
Length: Up to 40mm
This classic roach is often found infesting buildings. Despite the name, this species originated in Africa, but with the accidental help of humans has spread to all the warmer parts of the world.

4: *Thyreoxera spectabilis*

Length: Up to 25mm

A colourful cockroach found in the rainforests of South East Asia. As with many insects living in tropical climates, very little is known about its biology.

5: Mardi Gras cockroach

Polyzosteria mitchell
Length: Up to 50mm
The striking blue and yellow colours of this Australian cockroach act as a warning that it will squirt out a foul-smelling liquid if attacked.

6: Madagascar hissing cockroach

Gromphadorhina portentosa
Length: Up to 75mm
These slow-moving insects live in groups inside rotting logs in their native Madagascar. When alarmed, they create a hissing noise by expelling air through the small breathing holes along their sides.



Mantises

Mantises are the more glamorous wing of the Dictyoptera insect order, found most commonly in the tropics. Their stunning camouflage ranges from beautiful flowers to trembling leaves. That beautiful exterior is deceiving, however, as they are fascinating ambush predators. They catch their prey – mainly other insects – with their strong front legs which are equipped with rows of sharp spines. Gruesomely, their prey is consumed alive. While waiting for prey, mantises sit in a characteristic position with their front legs folded, giving rise to their common name of praying mantis. Mantises have large eyes situated on either side of their triangular head. Their flexible neck allows them to track the movement of approaching prey while moving only their head.

Courtship is a dangerous business for mantises as the male is much smaller and weaker than the female. Males of many species perform an elaborate swaying dance by way of courtship, but even so, if the female is hungry, she may prefer to eat him rather than mate with him. Sometimes she does both.

After mating, the female lays a batch of eggs which she covers with a quick-setting foam to create a tough protective case, known as an ootheca. The tiny young mantises that eventually emerge appear very delicate but are ferociously cannibalistic.

Key to plate

1: Ghost mantis

Phyllocoris parvidis

Length: Up to 50mm

This African mantis bears an uncanny resemblance to a dried, twisted leaf, complete with what appear to be leaf veins. So as long as it remains motionless, this species is almost impossible to spot.

2: Orchid mantis

Hymenopus coronatus

Length: Up to 75mm

This beautiful pink and white mantis

mimics the petals of a flower.

This helps the mantis avoid predation by birds, and, at the same time, attracts flower-visiting insects such as butterflies and bees which the mantis consumes.

3: Spiny flower mantis

Pseudocrotophaga wahlbergi

Length: Up to 40mm

This small African mantis resembles an elaborate creamy flower when motionless. If the camouflage fails and the insect finds itself under attack from

a predator, it can flash large eyespots on its wings which gives the impression that it is a much larger creature.

