



Insect Eyes

How do insects see the world?

By Thomas Daguerre

Have you ever looked at the bulging bug eyes of a fly, a wasp or a beetle and wondered how exactly they see the world? Whether, like people, they can see all the amazing colours and shapes we see everyday? It is hard to answer these questions precisely as we cannot take the place of a bumble bee as it visits flowers or an ant as it collects seeds. However, scientists have discovered a great deal about how these small creatures see the world. It is as varied and incredible as the number of different types of insects that live in your garden.

INSECT EYES

Normal sight in insects depends on two special organs - **Compound eyes** and **simple eyes**.



Photo by Tom Daguerre

compound eye

The compound eye

The compound eyes of insects are the main organ of sight. The outer surface of each eye is formed by a number of small lenses called **facets**. They are in a way similar to your pupil letting light into the eye. The number of facets varies from 1 in some insects to 20,000 in others. If there are only a few facets they are circular in shape, but

in most insects there are many facets all packed closely together - in this case they are hexagonal like honeycomb. Behind each facet there is a tube-like structure known as the **ommatidium**. Each one of these ommatidium, or tubes, casts a small segment of the image captured by the facet down into the eye. What this means is that the insect's eye produces a kind of "pixellated" image, much like a digital photo or your computer screen. When all the small pixels are combined an image is created.

The simple eye

The simple eye is also known as the **ocelli**. Simple eyes usually number 3 and are placed on the top of the insect's head. As their name suggests, they are very simple and can only detect light or dark.

A great variety of different vision exists in the insect world. Next time you see a colourful beetle or a scuttling spider try and think how they see you!

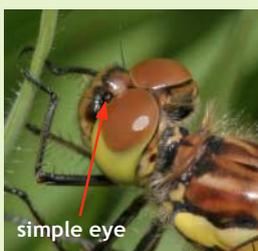


Photo by Robbie Murphy

simple eye

Big eyes & small eyes

Predatory insects, like this Robber fly, have big eyes allowing them to see their prey.



Photo by Ian Wood (ILF)

Predatory species

Robber fly

Insects that feed on plants often have small eyes and are eaten by the predatory insects.



Photo by Charles Lamb (ILF)

Prey Species

Caterpillar

Colour

Insects see colours very differently to people. This is because most of them view the world in a different colour spectrum, called ultra violet, which makes certain colours stand out. Bees use ultra violet to find flowers that have lots of pollen in them and other insects, like butterflies, use ultra violet to find a mate.

