

Flies and Wasps

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Flies and wasps are probably the most common insects seen in eucalypt forests or plantations. They play a very important role as natural enemies of other insects. Most flies and wasps seen in or around eucalypts are beneficial insects, being parasitoids of pest insects such as Chrysomelid beetle larvae (Forest Health Fact Sheet Number 21) and Autumn Gum Moth caterpillars (Forest Health Fact Sheet Number 4). A parasitoid is an organism that feeds on or in another organism, the host, thereby killing it. Each parasitoid has a single host.

Parasitoids are intermediate between true parasites, which do not kill their hosts, and predators, which kill many prey. Some flies and wasps are not beneficial, but these are exceptions. Examples of such species are Sawflies (Forest Health Fact Sheet Number 8) and those species that cause gall formation (Forest Health Fact Sheet Number 23).

Flies and wasps can easily be distinguished from each other as flies have a single pair of wings whereas wasps have two pairs of wings.

Flies

Flies found in eucalypt forests or plantations that are parasitoids are most likely to be Tachinid flies - that is belonging to the fly family Tachinidae. The adults are medium sized, very bristly, blowfly-like insects. They are usually grey or black in colour though some species are iridescent. Adults feed on nectar and it is the larval or maggot stage that parasitises other insects.

Tachinid flies are very common parasitoids of caterpillars. The maggots live within the body of the host, feeding on its tissues and eventually killing it. Female flies lay their eggs either:

onto the skin of the host. The white, oval eggs are frequently seen attached to the side of caterpillars. When these eggs hatch, the maggots burrow into the host to feed;

directly into the body of the host; or

onto the leaves which are then eaten by the host.

(Right: Tachinid fly eggs on Chrysomelid beetle larvae)



In some species only a single larva will develop inside each host. In other species many larvae develop inside a single host. Overseas, Tachinid flies have often been used as biological control agents. For example, they have been used in the control of the Gypsy Moth (*Lymantria dispar* (L.)) and the Browntail Moth (*Euproctis chrysorrhoea* (L.)), both of which are serious forest pests in Europe and America.

Note: Many flies on eucalypts are beneficial insects

Wasps

There are many different types of wasps that are very common in eucalypt forests and plantations. Some of these are parasitoids and like flies, are important in helping to regulate the numbers of many pest insects. Most wasps are parasitoids of the larval and egg stages of other insects though occasionally the adult stages are also parasitised. The most commonly found parasitic wasps are:

Ichneumon wasps (belongs to the wasp Family Ichneumonidae)

Braconid wasps (family Braconidae)

Chalcid, Eulophid and Encyrtid wasps (Family Chalcidae, Family Eulophidae and Family Encyrtidae respectively).

These all vary greatly in appearance and size, with those species that parasitise eggs being particularly small.



Parasitic wasp



Parasitic wasp cocoons

Ichneumonoid wasps:

These wasps are all parasitoids of the immature stages of other insects. The adults range in size from small to very large, 1.5 to 120mm in length. They are often black or black and orange with white markings and many species have dark coloured wings. The females have long egg-laying instruments, called ovipositors. Many people think the ovipositor is a "sting" and that these wasps are dangerous to humans but this is not so.

The female Ichneumon wasp finds a host insect, such as a caterpillar, and either:

Pierces it with the ovipositor and deposits an egg inside the host insect or
Lays an egg on the outside of the host insect. On hatching, the parasitoid larva either burrows into the host or remains external and inserts its mouthparts into the host to feed.

At first, the parasitoid larva feeds on fat tissue and the host may appear unaffected. However, as the parasitoid larva grows it destroys more and more of the host tissue and eventually kills it. Often the host is able to complete development and pupate before it is killed. When this happens the parasitoid larva pupates inside the host pupa and later an adult wasp emerges instead of the host insect. Sometimes only one parasitoid is associated with each host but more often many parasitoids are found in each particular host.

Braconid wasps:

There are several hundred species of these wasps. They range in size from 1 to 80mm long, and are usually black or black and orange in colour. They are mainly parasitoids of caterpillars and beetle larvae though some are parasitoids of insect eggs. In these species the parasitoid larva does not start to develop until the host egg hatches.



Braconid wasps lay many eggs into each host. One species, *Apanteles* spp. has been known to lay up to 150 eggs in a single host. These eggs hatch and the larvae feed on and eventually kill the host. In several species the parasitoid larvae then leave the host and pupate near its remains in small, white, silk cocoons. Masses of these cocoons are particularly common inside the shelters of Autumn Gum Moth caterpillars. (Pictured above: Tiny wasp parasitoids of Autumn Gum Moth eggs)

Chalcid, Eulophid and Encyrtid wasps:

These are tiny wasps, most species being less than 3mm in length. Some species have enlarged hind legs enabling them to jump when disturbed. They have clear wings with very few veins. Many species are egg parasites. Some species are hyperparasites (parasites of parasites) and thus are not beneficial even though the host insect still dies.

Chalcid wasps are 1.5-16mm in length. They are usually solitary parasitoids of caterpillars though they do attack other insects particularly flies and Ichneumon and Braconid wasps

Encyrtid wasps are 0.5-5mm in length. They mainly attack caterpillars, beetle larvae and scale insects.

Eulophid wasps are 0.6-6mm in length. Some species are external parasitoids of caterpillars. Other species attack leafminers or are found in galls. They are also parasitoids of other insect eggs and pupae.

Note: Many wasps are beneficial insects

Summary

When to look: Look for flies and wasps all year round particularly in summer.

Where to look: Look on leaves or in the air around trees.

What to look for: Look for flies and wasps flying or resting on leaves.
Look for small, oval white eggs on the bodies of caterpillars and other larvae.
Look for wasp cocoons in caterpillar shelters.

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