

# LEAF BEETLES



## THE MYSTERIOUS AUSTRALIANS

**by Graham Hall**

There are many native species of leaf beetle, yet little is known about them. In Australia they are kept down by natural predators; in South Africa and New Zealand, however, where they have no natural enemies, one Australian species turned into a scourge. After a visit from a beleaguered South African entomologist, Australian research scientists are now collecting and rearing leaf beetles to help unravel their mystery.

**L**EAF beetles are widespread in Australia (including Tasmania) and south-eastern Papua New Guinea. There are over 250 species, at least 30 of them in Western Australia, and new species are still being found. Yet anyone in Western Australia who attempts to identify a leaf beetle from the published descriptions will quickly run into trouble: the group's taxonomy is confused.

There are at least two reasons for this. First, one of the characteristics of leaf beetles is that they fade to a uniform dull colour when dead; yet early workers seldom examined living beetles or studied their biology. Second, what few biological

studies there are on leaf beetles have concentrated on the species found in eastern Australia and Tasmania, making it very difficult to identify species in this State.

Much remains to be discovered about leaf beetles, but some of their characteristics, and some aspects of their life cycle, are beginning to be understood.

### FROM EGGSHELLS TO CYANIDE MISSILES

Leaf beetles are usually active from September to March. After mating, the female lays eggs on young leaves or shoots, or under bark scrolls. When the larva is

ready to hatch it draws its hatching spines, or egg-bursters, down the egg shell until they cut two slits, enabling the larva to force its way out. The larvae in an egg cluster hatch at about the same time, and consume their egg shells before moving off together in search of green food.

Both adults and larvae feed on leaves. The adults feed alone around the edges of a leaf, producing a scalloped effect, whereas the larvae will gorge on a leaf until they destroy it; then they will move to another. The mature larvae form loose congregations but feed voraciously as they move about.

When fully fed, the larvae drop to the ground and tunnel into the soil. The pupal cell is made of earth particles cemented together with a larva's secretions. When the adults emerge they fly in short, abrupt flights from one part of the tree to another. They are most active in early mornings and late

The leaf beetle *Paropsis elytrura* is widespread, and found on many WA eucalypts.

Photo - Peter Kelly ◀

*Chrysophtharta varicollis* is commonly found on flooded gum during September and October.

Photo - Peter Kelly ▼

Photo previous page - Scientists are attempting to breed this rare *Chrysophtharta* species in captivity.

Photo - Jiri Lochman



afternoons. Between these times the beetles remain under leaves, and if disturbed drop to the ground, where they blend in with the litter.

Although the story is different overseas, in Australian forests the damage by leaf beetles is slight. Many native enemies attack them. Birds and bugs eat the larvae, and some very small wasps parasitise the beetle eggs.

The tachinid fly is also known to be a parasite, this time of the larvae themselves, and it achieves the feat in spite of the latter's defences. Near the base of the abdomen, each larva has a pair of glands that release a clear fluid when jerked upwards. The secretion smells strongly of almonds, and contains cyanide. The brew appears to be deadly enough; meat ants coming into contact with the secretions are knocked down in 20 seconds and die within two minutes. How the fly parasites escape the cyanide treatment is a mystery, even though they approach the larvae with considerable caution. Yet escape it they do - it is not uncommon for 50 to 70 per cent of larvae in an aggregation to be parasitised.

## BETTER VERSUS EUCALYPTS

Some leaf beetles prefer certain trees, while others have a wide range of hosts. Closely related species often occur on very different groups of eucalypts growing in mixed stands. Certain leaf beetles in eastern Australia are so abundant on some eucalypts that they can cause crown



decline and even the death of young trees. As yet no leaf beetles are known to cause similar problems in WA. The flooded gum supports many species, but jarrah is not preferred by many beetles. It could be that jarrah leaves are tougher or have more toxic chemicals than other species.

In South Africa and New Zealand, where the beetles have been accidentally introduced, there are no natural enemies and there is an explosion of beetle numbers in large eucalypt plantations. In New Zealand the activity of one species

(*Paropsis charybdis*) has stopped the development of new plantations.

In the mid-1980s an entomologist from South Africa, Geoff Tribe, visited Western Australia to search for natural enemies of one particular leaf beetle (*Trachymela tincticollis*) that defoliates eucalypts in his country. Geoff realised that the beetle was originally from Australia, where leaf beetles are native. In South Africa *T. tincticollis* severely attacks tuart, which only grows naturally in the South West of WA but has been widely planted overseas. Furthermore, specimens of the beetle in the British Museum had been collected on tuart in south-western Australia. Geoff's detective work proved to be correct; he found *T. tincticollis* on tuart in the South West.



This *Paropsis* species is only known from Anderson Lakes Nature Reserve, north of the Stirling Range.  
Photo - Jiri Lochman ◀

*Paropsis geographica* is usually found on tuart or flooded gum. Its eggs are often parasitised by tiny wasps.  
Photo - Geoff Tribe ▲

Larvae of a *Paropsis* species, just before pupation.  
Photo - Peter Kelly ◀◀





## LEAF BEETLE OR LADYBIRD?

Leaf beetles make up one family (Chrysomelidae) of the beetle order Coleoptera. Another family contains the ladybirds (Coccinellidae), which are the only insects that look superficially like adult leaf beetles.

### LADYBIRD

Adult size 1-7 mm  
 Adult colour Yellow to black spotted

#### Feeding

adults: predatory  
 larvae: predatory

#### Behaviour

adults: gregarious  
 larvae: solitary

### LEAF BEETLE

Adult size 1.5-22 mm  
 Adult colour Bright, spotted or metallic

#### Feeding

adults: leaves  
 larvae: leaves

#### Behaviour

adults: solitary  
 larvae: gregarious



Geoff also found many other species of leaf beetles and documented their natural enemies. It was he who identified the two species of wasp parasites which are highly specific to *T. tincticollis* eggs. Because he found that these wasps could defeat the larvae's cyanide spray, they looked very attractive as a potential controlling force. Sure enough, when the wasps were released in South Africa they rapidly reduced the problem.

Geoff Tribe's visit was the catalyst for other research scientists to examine some of the leaf beetles in this State. Our forests and woodlands support a rich and diverse beetle fauna, most of them beautiful and fascinating. The work now under way is the first step toward understanding their life cycles and ecological requirements, so that future generations can enjoy their beauty and charm. □

Female *Paropsis elytrura* lay eggs in a characteristic whorl around twigs or leaf stems.

Photo - Peter Kelly ◀

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# LANDSCOPE

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*In the central Kimberley, a screw-pine-surrounded creek - just one of the threatened areas in this fragile frontier. Turn to page 22.*



*Until 1984 more was known about what was underneath the Nullarbor than what was on top. But with such a vast area to study, where do we start? See page 16.*



*Public awareness and involvement is vital in the conservation of WA's rare and endangered flora. Page 49.*



*Ten WA mammal species have become extinct in the last 200 years. What can be done to ensure no more are lost forever? Page 28.*



*Forests protect our environment. They also provide timber. How do we strike a balance? Turn to page 35.*

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*Illustrated by Martin Thompson.*



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