



# EUCALYPTUS TORTOISE BEETLE BIOCONTROL

Scion wants to import the Tasmanian parasitoid wasp, *Eadya paropsidis*, into our containment facility to evaluate it as a biocontrol agent against the forestry pest *Paropsis charybdis*, or eucalyptus tortoise beetle. Scion has a long history of managing pests using biocontrol for the forest industry.

## PROTECTING OUR EUCALYPTS

*Eucalyptus* plantations are part of New Zealand's diversified commercial forestry industry, providing pulp and hardwood timber, with additional benefits in agroforestry, honey production, firewood and carbon sequestration. Eucalypts are also widely used as amenity trees in urban areas.

The eucalyptus tortoise beetle has been a pest of gum trees in New Zealand since it invaded Lyttelton Harbour in 1916. It is causing significant damage to our eucalypt crops, specifically *Eucalyptus nitens*, the species grown for wood, and pulp and paper.

## RAPID POPULATION GROWTH

There are no native *Paropsis* beetles in New Zealand and therefore no natural enemies, enabling populations of eucalyptus tortoise beetle to grow at an alarming rate. The beetle undergoes two generations per annum with both larvae and adult beetles eating copious amounts of young eucalypt leaves for many months of the year.

Host-specific biocontrol agents *Enoggera nassau* and *Neopolycystus insectifurax* have already been introduced to New Zealand from Australia, which predominantly target the egg stage of the eucalyptus tortoise beetle life cycle. These have proven insufficient to reduce the population levels of the pest.

Our scientists have been studying the specialist parasitoid *Eadya paropsidis* which has evolved to attack the larval stages of only eucalypt leaf-feeding beetles and nothing else. We now wish to import this parasitoid into containment at our secure facility in Rotorua.



*Eadya paropsidis* injecting an egg inside a tortoise beetle larva in Australia.

Photo: A. Rice

## WHAT IS BIOCONTROL?

The deliberate use of natural enemies to reduce pest populations in modified habitats is called biological control (or biocontrol). It often involves importing an insect parasitoid or predator from the pest's native environment where they have evolved closely together over millennia.

**What is a parasitoid?** A parasitoid lives most of its life attached to, or inside a single host. If it cannot find its host, it will die without being able to reproduce.

**Sustainable and economic.** Biocontrol is an effective and environmentally sustainable method of managing unwanted pests. It is one of the most important alternatives to chemical pesticides and in many locations, the only economic and practical solution.

Several host-specific biocontrol agents have already been introduced to New Zealand from Australia against other pests. Successful biocontrol can substantially reduce potential economic losses and often remove the need for pesticide application.

***Eadya paropsidis*.** Adult parasitoids are about 10 mm long with a black body and bright orange head. The parasitoid specifically hunts for tortoise beetle larvae on eucalyptus foliage, stinging them and laying an egg inside them. Only one parasitoid develops to maturity within each host.

The parasitoid larvae feed within the host tortoise beetle larvae for about 21 days. They then emerge, killing the host, and pupate within the soil. After hibernating as a pupa for about ten months, the adult parasitoid hatches in springtime. Only one generation is produced per year.

## EVALUATING *EADYA* WITHIN CONTAINMENT

Importing the parasitoid wasp *Eadya paropsidis* into containment allows our entomologists to assess its host specificity against a range of New Zealand native and beneficial beetles. This will determine whether any non-target beetles could be at risk.

This testing is a key component of biocontrol projects involving the deliberate importation and release of any new biocontrol agent. Data gathered within the next three to four years (the usual duration of a host specificity testing project) will be provided to the community, special interest groups, Māori and others to examine and ask questions.

If our research continues to show that the parasitoid is likely to be beneficial, these data will be provided to the Environmental Protection Authority (EPA) to undertake a cost/benefit risk assessment of the proposed release, and ultimately decide if *Eadya paropsidis* can be released in New Zealand.

## ABOUT SCION

Scion is a Crown Research Institute that specialises in research, science and technology development for the forestry, wood product and wood-derived materials and other biomaterial sectors. Scion's purpose is to create economic value and contribute to beneficial environmental and social outcomes for New Zealand.

We offer research and development services across the entire forestry value chain, including forest and climate change, forest health and biosecurity, rural fire research, forest management and tree improvement.

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