



Biological Control of Boneseed with the Boneseed Leaf Buckle Mite

June 2008

LC0433

ISSN 1329-833X

Jamie Davies and Tom Morley, DPI Frankston

*This Landcare Note provides a summary of the biology and potential impacts of the boneseed leaf buckle mite, a biological control agent for boneseed, *Chrysanthemoides monilifera* ssp. *monilifera*.*

Common and scientific names

Boneseed leaf buckle mite, *Aceria* sp.
Family Eriophyidae (bud, blister, gall and rust mites). All mites are in the Subclass Acari (mites and ticks), Class Arachnida (which also includes spiders and scorpions).

Background

Boneseed (*Chrysanthemoides monilifera* ssp. *monilifera*) is native to the south-west Cape region of South Africa. Most of the existing infestations are believed to be derived from garden escapes. Boneseed is widespread and densely established in several areas of Victoria, with major infestations in the You Yang Ranges, Mornington Peninsula, Bellarine Peninsula and on the coast near Anglesea. For more detailed information on boneseed refer to Landcare Note LC0181.



Figure 1. Boneseed infestation west of Melbourne near You Yangs regional park.

The boneseed leaf buckle mite was imported into the quarantine facility at DPI Frankston and reared under quarantine conditions to ensure a clean, disease free culture. Following this, the mite was released in 2008 at carefully selected sites in Victoria, Tasmania and South Australia. These sites will serve as nurseries to enable collection and transfer of colonies to new release sites.

Description

Eriophyids are specialised plant-feeding mites with the following characteristics:

- **Very small** (even by mite standards) – individual mites cannot be seen with the naked eye and are difficult to see with a magnifying glass. Boneseed leaf buckle mite is approximately 0.15 mm long and 0.05 mm wide.
- **Elongated worm-like body** (Figure 2).
- **Four legs** – most other mites have eight legs.

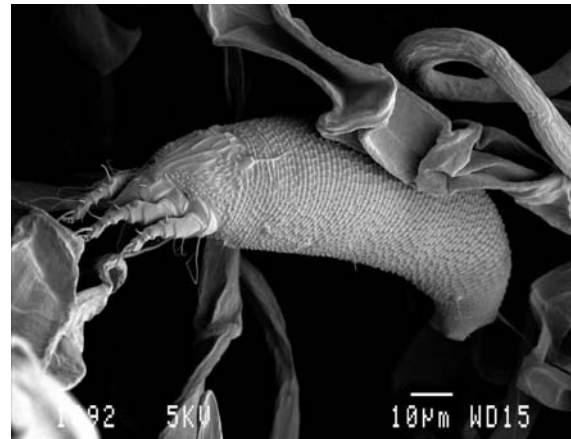


Figure 2. Scanning Electron Micrograph of boneseed leaf buckle mite.

Life cycle

The life cycle of the boneseed leaf buckle mite consists of egg, larva, nymph and adult. The duration of the life cycle is unknown, but there is likely to be multiple generations per year. Other eriophyid mites can develop from egg to egg-laying adult in approximately 10 days under ideal conditions in the laboratory. Such ideal conditions may occur in summer when plants are healthy and not drought-stressed. Development will take longer during cooler weather (eg winter). Adults may live for several weeks and females may lay one or more eggs daily.

Impact

Eriophyid mites have piercing and sucking mouthparts that are used to extract cell contents. All eriophyid mites feed on plants, some induce distorted growth such as galls. Boneseed leaf buckle mite induces the formation of specialized galls called **erinea** (pl.) or **erineum** (singular). These appear as abnormal patches of leaf hairs associated with a distorted area on the leaf (Figs 3 and 4).



Figure 3. Development of erinea on boneseed leaves causes distorted leaf growth.

Production of erinea is closely linked to plant growth; they are initiated by boneseed leaf buckle mite feeding on embryonic leaves at the shoot tip. As the young leaf grows, a colony of boneseed leaf buckle mite develops within the erineum. Eventually many mites may occur in a single erineum. Erinea are present on infested plants throughout the year and new ones develop during boneseed growth flushes. Erinea provide a safe harbor from predators, protection from weather extremes, a plentiful food supply and an environment suitable for breeding. One to a few erinea may develop randomly over the leaf surface.



Figure 4. Close up of an erineum on a distorted boneseed leaf.

There is currently little information on the impact of boneseed leaf buckle mite on boneseed. Heavily infested boneseed plants in South Africa are unthrifty and appear to have lower growth rates and reproductive outputs than uninfested plants. Leaves may become severely distorted and plants may become stunted due to a reduction of photosynthetic tissue. Sometimes lateral buds are entirely converted to a small erineum from which new branch development is prevented.

Integrated control

Biological control cannot eradicate a weed but can reduce the spread and density of infestations. In some cases, control is achieved to the level where the weed is no longer of concern and no other control is necessary. More commonly, other methods are still required. Biological control should not be considered the complete answer to a boneseed problem. It should be used in conjunction with other control measures in an integrated management program. For more information on biological control refer to Landcare Note LC0163.

Other biological control agents for boneseed have been introduced from South Africa and include the bitou tip moth (*Comstolopsis germana*), the black boneseed leaf beetle (*Chrysolina* sp.), the blotched boneseed leaf beetle (*Chrysolina picturata*), the painted boneseed leaf beetle (*Chrysolina oberprieleri*), the lacy-winged seed fly (*Mesoclanis magnipalpis*) and the boneseed leaf roller moth (*Tortrix* sp.). Although these insects can be destructive on *Chrysanthemoides* in South Africa, none has yet successfully established in Australia. A contributing factor to establishment failure has been predation by native insects and mites.

Further information

If you wish to be part of the boneseed biocontrol program, please contact DPI Frankston, PO Box 48 Frankston, ph. 03 9785 0111.

Acknowledgments

The boneseed biological control program is a collaborative project between DPI Victoria and the Tasmanian Institute of Agricultural Research (TIAR). Federal funding was provided by the Defeating the Weeds Menace program, Department of Agriculture Fisheries and Forestry.

Reviewed by: John Ireson, TIAR.

Figure 2: Charnie Craemer (ARC-Plant Protection Research Institute, Pretoria, South Africa) and Alan Hall (University of Pretoria, South Africa).

The advice provided in this publication is intended as a source of information only. Always read the label before using any of the products mentioned. The State of Victoria and its employees do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication.