

M Metaphycus

Soft scale parasites (under development)

Biocontrol organism

☞ *Metaphycus* spp.

There are many species of parasitoids in the genus *Metaphycus*. Some have been released as part of classical biological control programs in Australia.

In the mid-1990s releases of *Metaphycus lounsburyi* (previously *bartletti*), a black scale parasite, were made throughout southern citrus-growing districts. Black scale diminished as a pest in these districts, so further releases were not considered necessary.

Metaphycus luteolus, a vigorous parasite of soft brown scale, is at present in quarantine awaiting approval for release. It also parasitises second-instar black scale. It is hoped this parasite will improve control of soft brown scale in citrus by aiding the range of beneficials presently established in the orchards.

Metaphycus helvolus, an efficient parasite of soft brown scale and black scale, is mass reared and used successfully in release programs in California. This parasite is present in Australia and is under consideration for mass rearing.

Metaphycus sp. n. (previously *M. lounsburyi*), which is not yet renamed, is also present in Australia, and was originally released for black scale control. It is also able to parasitise grapevine scale and is likely to be of use in wine grapes. This species is also under consideration



Plate 61: *Metaphycus lounsburyi* (formerly *bartletti*), an imported parasite of black scale



Plate 62: Female *Metaphycus helvolus*, an efficient parasite of soft brown scale and black scale



Plate 63: Soft brown scale on a leaf

for mass rearing as some interest has been expressed from the wine industry.

Target pests

Some releases of metaphycus have been made, particularly for the control of soft brown scale (*Coccus hesperidum*), black scale (*Saissetia oleae*) and citricola scale (*Coccus pseudomagnoliarum*). All these soft scales have high reproductive capacities, giving rise to 200–2000 young scales, depending on the species and the health of the adult scale.

Suitable crops/environments

The scales mentioned above quite commonly infest crops such as citrus, olives, passionfruit, figs, custard apples and a wide range of ornamentals including gardenia, oleander, ferns and palms. Soft scales feed on the sap of plants. Large numbers can affect plant health and can

even kill the plants. More commonly they produce large amounts of sugary honeydew, leading to sooty mould which grows on the honeydew. The sooty mould causes downgrading of fruit quality in citrus, and is very unsightly in ornamentals.

The honeydew also attracts ants, which can interfere with the biological control of soft scales. Ants will actively defend honeydew-producing pests from parasites and predators, thus protecting their food source. Control of ants is therefore very important to improve the biological control of soft scales.

At release

Releases of metaphycus occur during spring, summer and autumn, to coincide with the second and third instar stages of soft scales. *Metaphycus* spp. are sensitive to organophosphate and other broad-spectrum pesticides. If pesticides have been used, wait for 4 weeks before releasing.

Parasites are generally released as adults, but may be dispatched as parasitised pupae inside the soft scale bodies. Releases are generally inoculative, so release parasites where soft scales are known to exist, and try to control or reduce ant populations in the release vicinity beforehand.



Plate 64: Soft brown scale parasitised by metaphycus. Note the three wasp pupae visible under the scale cover.

After release

Metaphycus can be detected after release by monitoring the appearance of the scale bodies. Parasitised scales can be detected as the scale bodies dry out and discolour to a tan colour, and parasitised pupae can be seen through the scale body.

Other natural enemies of soft scales

Parasites

Coccophagus spp.
Microterys flavus
Scutellista spp.

Predators

Cryptolaemus montrouzieri
Brown and green lacewings
Paraprius ladybirds
Rhyzobius ladybirds
Diomus ladybirds



Plate 65: Black scale on a leaf midrib