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EUGENIA PSYLLID BIOLGICAL CONTROL

Eugenia psyllid adult (photo by Jack Kelly Clark)

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Background

The eugenia psyllid, *Trioza eugeniae*, attacks eugenia, also known as Australian bush cherry, *Syzygium paniculatum* Gaertn. (=*Eugenia myrtifolia*), a common ornamental tree or shrub in California. The psyllid was first discovered by a homeowner in Los Angeles County in May 1988. By September 1988, the psyllid had been found on residential properties in several cities in Orange County, and by the end of 1988 the psyllid was found in Ventura, Santa Barbara, San Luis Obispo and San Diego Counties. Early in 1989, the psyllid began to appear in northern California, and to date has been found in the coastal counties as far north as Marin and in Napa Counties. The psyllid has not been found in the Central Valley. The rapid spread of the eugenia psyllid was undoubtedly facilitated by the frequent movement of nursery stock throughout the state.

Description of Pest and Damage

The eugenia psyllid has 3 to 5 plus overlapping generations, apparently determined in part by the interaction of temperature and the physiological state of the host plant. After mating, the female psyllid partially inserts yellow football-shaped eggs (Fig. 1) into the edges of the new terminal leaves. Small mobile nymphs hatch from the eggs and settle on the newly expanding leaves, primarily on the ventral surface, where they feed and develop in a cup-shaped pit or gall (Fig. 2), formed by the plant's response to the psyllid's feeding.

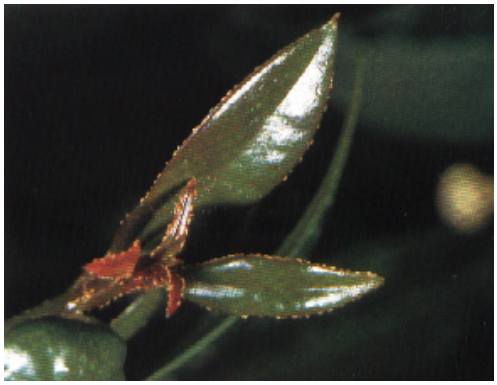

Fig. 1. Eggs of the eugenia psyllid (Jack Kelly Clark)

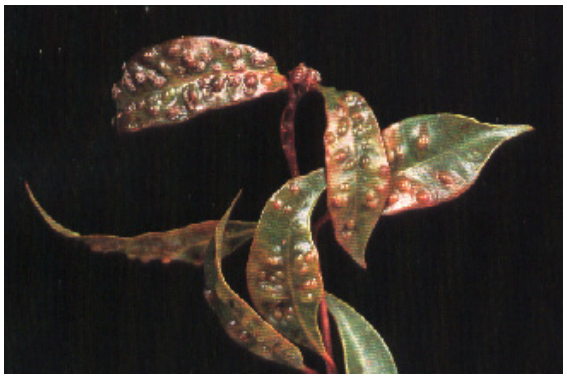

Fig. 2. Pits on eugenia from the psyllid nymph

Psyllids produce honeydew, a sticky substance which falls on sidewalks and cars. Acute plant damage caused by high psyllid densities include inhibition of new shoot formation, distortion of foliage and stems,

and a spoiled plant appearance as a result of the black sooty molds growing on the honeydew. In large quantities, honeydew can cause unpleasant effects on sidewalks and cars. Chronic effects of sustained high infestation are well documented, and include severe weakening of plants, poor growth characteristics, and lowered economic value.

Biological Control

Observations on the biology of the eugenia psyllid were initiated at our laboratory in Albany and at other locations in Alameda County in 1989-90. Some native natural enemies have been noted on the psyllid in California, but their effects on psyllid populations have been negligible.

A search for natural enemies of the psyllid was conducted at several locations in Australia in late 1991: within the native range of eugenia in New South Wales and from ornamentals in Victoria and in South Australia. A primary parasitoid, a eulophid wasp in the genus *Tamarixia*, was sent to our quarantine facilities in Albany between November 1991 and January 1992. *Tamarixia* sp. was released from quarantine

Tamarixia sp. (Fig. 3). is an external parasitoid of the eugenia psyllid's larger nymph stages. The wasps are tiny (less than 1 mm); the female is readily distinguished from the male by the large yellowish spot on the anterior of the abdomen The female lays an egg between the leaf tissue and the psyllid nymph in the gall created by the psyllid feeding. A small larva hatches from the egg and eventually kills the psyllid. The larvae transforms into a new adult under the psyllid carcass. The new adult chews a hole in the dorsum of the carcass, emerges and starts the next generation of *Tamarixia*. A generation takes about 3 to 6 weeks during the summer months.

Fig. 3. *Tamarixia* sp. parasitoid

Parasitoids were initially released in Disneyland, Orange County, California in July 1992, and in Alameda County in August 1992. Subsequent releases were made in 1993 in San Diego, San Luis Obispo, Santa Clara, and Alameda counties. The parasitoids spread rapidly and successfully overwintered. Most coastal areas of the state had parasitoids by 1994.

Monitoring systems were designed and set up to quantify the initial psyllid populations and effects of the introduction of the parastoid. Peak psyllid numbers decreased each year by a factor of 10 to 20 from 1992 to 1994 at the Disneyland site. Similar effects were observed at the other release locations from 1993 to 1995. At some sites the psyllids increased somewhat in the April-May 1995 period, perhaps due to a very wet spring which encourged plant growth and had a negative effect on overwintering parasitoids. By mid-late summer 1995 psyllid levels had again subsided.

Yellow sticky trap used to monitor adult psyllid and parasitoid numbers.

In cooler areas of the California coast, such as the city of San Francisco, the parasitoid populations do not increase quickly enough to respond to sudden increases in psyllid numbers. We are studying why this may be at the present time (1999).

We are experimenting with pruning treatments for areas such as San Francisco where the parasitoid does not adequately control the psyllid. Pruning new foliage may provide

effective control if timed to follow maximum spring growth, by effectively removing psyllid eggs and young nymphs, and allowing time for parasitoid numbers to build up from the low winter pupulations. The pruned material is left on the ground under the trees for at least three weeks to allow any parasitoids present to escape.

We may import new strains of the parasitoid or another parasitoid species to help control the psyllid in the future.

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