common name: olive psyllid (suggested common name)
scientific name: *Euphyllura olivina* (Costa 1839) (Hemiptera: Psyllidae)

Introduction – Distribution – Description – Life Cycle – Host Plants – Management – Selected References

Introduction

The olive psyllid, *Euphyllura olivina* (Costa), belongs to the superfamily Psylloidea, which consists of six families. As its common name suggests, the olive psyllid (**Figure 1**) is found within the family Psyllidae, which contains over 100 genera (Myers et al. 2016). Psyllids are often referred to as jumping plantlice due to the nature of their quick jumping movements. Psyllids generally are monophagous (feeding on one plant species) or oligophagous (feeding on plants within a related group) (Kabashima et al. 2014). However, the olive psyllid is polyphagous, feeding on hosts that belong to different families.

The olive psyllid nymphs and adults produce a white, waxy secretion (**Figure 2**), which can cause premature flower drop during infestations. The waxy secretion completely covers the nymphs, most likely to hide themselves from predators or to prevent desiccation by blocking sunlight (M.W. Johnson, personal communication). Honeydew, also produced by nymphs and adults, can lead to sooty mold developing on the surface of the host plant (Johnson 2009). Damage to the host plant is predominantly caused by olive psyllid nymphs feeding (Alford 2014).

Figure 1. Adult olive psyllid, *Euphyllura olivina* (Costa). Photograph by Marshall W. Johnson, Center for Invasive Species Research, University of California Riverside.

Figure 2. Secretions made by *Euphyllura olivina* (Costa) on buds of an olive tree, *Olea europaea* L. Photograph courtesy of Wikimedia Commons (User Morini33, CC BY 3.0).

Distribution

According to the psylloidea database Psyl'list, the olive psyllid has been recorded in Algeria, Austria, England, France, Germany, India, Iran, Italy, Montenegro, Morocco, Portugal, Slovenia, Spain, Switzerland, Tunisia, and the United States (Ouvrard 2016, Meftah 2014). Currently, the olive psyllid is not found in Florida, but it does have the potential to spread via olive tree importation. Within the United States, the olive psyllid occurs in southern California in San Diego, Orange, Riverside, and Monterey counties (Johnson 2009). It was first discovered in California in July 2007 in San Diego and Orange counties (Johnson et al. 2010).

Description

The olive psyllid life cycle lasts about three months depending on the temperature, with optimal conditions being between 20 and 25°C (68 and 77°F) (Johnson et al. 2010). The rate of mortality increases at temperatures above 32.2°C (90°F). In California, psyllid populations drop after June due to the rise in temperature, and populations will not steadily rise until the following spring (Zalom et al. 2014).

Typically, three generations of olive psyllids occur annually. The first generation feeds as nymphs beginning in March (Alford 2014). The second generation begins feeding in May but becomes inactive (going through aestivation) once temperatures reach 27.2°C (81°F) (Alford 2014, Johnson 2009). The aestivating olive psyllids hide in cracks of the host plant's trunk

(Zalom et al. 2014). When temperatures become optimal again, usually in September, the olive psyllid nymphs return to their active states (Alford 2014). The third generation of nymphs appears in September and October (Zalom et al. 2014).

Most native psyllids in California are not pests, but introduced species like the olive psyllid typically become pests (Kabashima et al. 2014). When nymphs and adults feed, they rupture plant cells and suck the host's sap, reducing the amount of nutrients reaching certain parts of the host. This only becomes a problem when olive psyllids are on inflorescences (flower clusters) because it affects fruit production. Outside of the United States, it has been found that more than 20 nymphs per inflorescence have caused yield losses to reach up to 60% (Johnson 2009). (California has yet to see losses of such high value.) The olive psyllids' waxy secretions that accumulate on the host plant also reduce the yield by causing premature flower drop (Johnson et al. 2010).

Olive psyllids, both immature and adult stages, excrete honeydew due to their body's inability to use all of the nutrients ingested from their uptake of sap. The accumulation of honeydew on foliage encourages sooty mold (**Figure 3**) to develop, which can potentially block sunlight and inhibit photosynthesis, or lead to premature ageing of leaves that causes the leaves to drop (Laemmlen 2014). The second generation causes the most damage in regards to olive yield, because the immature olive psyllids are present during the growing season (M.W. Johnson, personal communication).

Figure 3. Sooty mold on leaves of California laurel, *Umbellularia californica*. Photograph by Joseph O'Brien, USDA Forest Service, Bugwood.org (CC BY 3.0 US).

Life Cycle

Eggs: Female olive psyllids lay eggs on new shoots, on top of twigs or leaves, and on buds (Johnson 2009, Zalom et al. 2014). Females can lay up to 1,000 eggs during their lifespan (Johnson 2009). Eggs will take one to two weeks to hatch (Alford 2014). The eggs appear oval in shape, are light yellow, and measure about 0.3 mm long (Zalom et al. 2014).

Nymphs: Nymphs (**Figures 4 and 5**) have a flattened, light green and white body along with reddish-purple eyes. The olive psyllid goes through five nymphal stages (that range from 0.4 mm to 1.5 mm long), which last a total of about five weeks until the adult stage is reached (Zalom et al. 2014, Alford 2014).

Figure 4. An olive psyllid, *Euphyllura olivina,* in its first instar on an olive leaf. Photograph by Marshall W. Johnson, Center for Invasive Species Research, University of California Riverside.

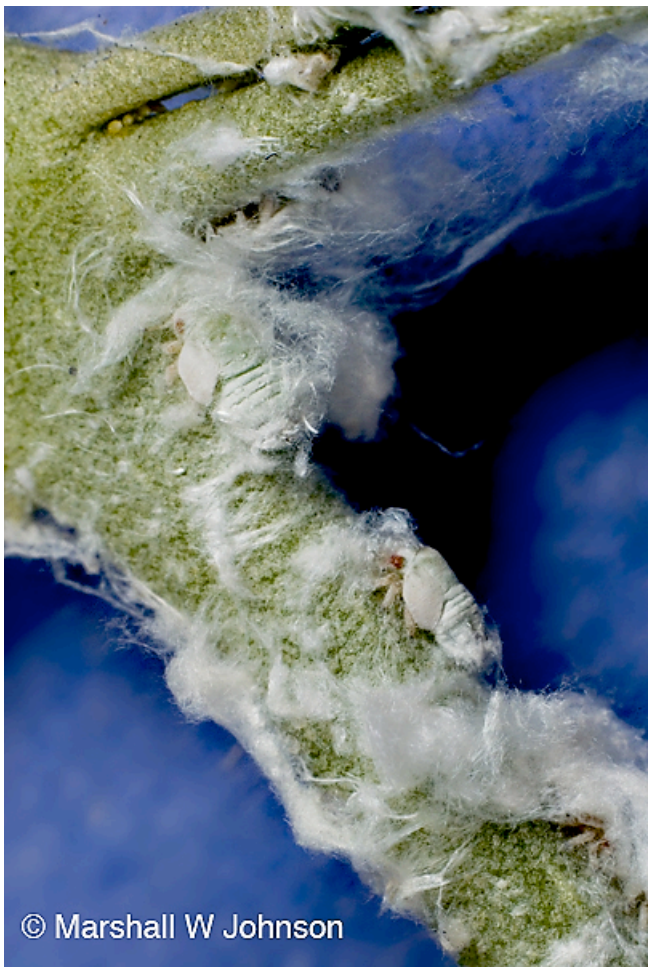

Figure 5. Olive psyllid, *Euphyllura olivina*, nymphs on olive stem. Notice the waxy secretions covering the stem. Photograph by Marshall W. Johnson, Center for Invasive Species Research, University of California Riverside.

Adults: Adult olive psyllids are dull green to gray in color with slightly black-mottled forewings. The adults measure about 2.0 to 2.5 mm long (Alford 2014). Adult males live between 24 and 44 days, while females live between 26 and 50 days (Meftah et al. 2014).

Host Plants

The olive psyllid feeds on Russian olives (*Elaeagnus angustifolia* L.), mock privet/green olive trees (*Phillyrea latifolia* L.), and olive trees (*Olea europaea* L.) (Johnson 2009). In a study published in the Official Journal of the International Olive Council, scientists discovered olive psyllids have particular sensitivities to differing olive tree varieties, which included Haouzia,

Arbequina, Manzanilla, and Picholine marocaine. The olive psyllid success rate was highest for the Haouzia variety (Meftah et al. 2014). Additionally, olive psyllids tend to choose healthy hosts over unhealthy hosts (M.W. Johnson, personal communication). An unhealthy host may be suffering from infestation by other pests or disease or be in an unsuitable location for ideal growth.

Management

Host plants need to be monitored for olive psyllid populations to prevent infestations. Methods of monitoring include using sticky traps, agitating foliage to count fallen adults, and careful inspection of plant parts for eggs, nymphs, and adults (Kabashima et al. 2014). Plant suckers (shoots) at the base of the tree, if they have not been removed, should be inspected for olive psyllids (M.W. Johnson, personal communication). It is best to monitor for the first generation of olive psyllids because the reduction in that generation's population will help prevent the second generation from becoming too large. Treatment is advised if more than 10 olive psyllids are found per inflorescence (Zalom et al. 2014). In the United States, olive psyllid infestations are mostly found on ornamental olive trees (Johnson 2009).

Cultural control: Olive psyllid populations may be reduced by pruning. Growers can prune infested areas, mainly suckers, along with center limbs to enhance air circulation that increases heat exposure to olive psyllids (Johnson 2009, Kabashima et al. 2014).

Chemical control: Insecticides, should they become necessary, are best used before olive psyllids begin producing their waxy secretions, which offer protection from chemicals (Zalom et al. 2014). Because the secretions cause difficulties for control, insecticides should target the first generation to avoid problematic second generation infestations (Kabashima et al. 2014). There are nonresidual, contact insecticides that work against psyllids, such as neem oil, insecticidal soap, and narrow-range oil (Kabashima et al. 2014).

Biological control: In a Tunisian evaluation it was reported that the olive psyllid is parasitized by the endoparasitoid *Psyllaephagus euphyllurae* (Masi), and its predators include *Anthocoris nemoralis* (L.), *Chrysoperla carnea* (Stephens), and *Coccinella septempunctata* L. *Anthocoris nemoralis* was the most abundant predator—49% of the total natural enemies found (Gharbi et

al. 2012). In the United States, the mealybug destroyer (*Cryptolaemus montrouzieri*), green lacewing (*Chrysoperla rufilabris*) larvae, and some lady beetles have occasionally been found around the olive psyllid (Johnson et al. 2010). Researchers in California plan to evaluate whether the mealybug destroyer and the green lacewing will be able to control infestations (Johnson 2009).

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