



Guide to Insect and Mite Pests of Tea (*Camellia sinensis*) in Hawai'i

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This guide provides photographs and general information about insect and mite pests associated with tea in Hawai'i. Details on pest identification, crop damage, crop hosts, pest life cycle, and pest distribution are given. Accurate identification of the pest is essential for making sound pest management decisions. Early detection is often critical to eventual success in managing pests and reducing economic losses.

The pests were selected based on surveys of tea plants growing at the UH-CTAHR Mealani Research Station at

2800 feet elevation in Waimea on Hawai'i. In addition, pests were collected from cooperating growers in other locations on Hawai'i. Pest samples were identified by the UH-CTAHR Agricultural Diagnostic Service Center (ADSC).

If you suspect pest problems but cannot determine the cause, we suggest that you submit plant samples to the ADSC for identification. The samples may be taken to the nearest UH-CTAHR Cooperative Extension Service office.

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Chinese rose beetle

Adoretus sinicus Burmeister, Coleoptera: Scarabaeidae

Damage

Adult Chinese rose beetles are nocturnal and chew plant leaves. Recently transplanted and young plants appear to be most susceptible, although established plants may also be attacked. Serious defoliation can occur when pest numbers are high, and this may kill young plants. Only the adult stage of the insect will damage crops.

Identification

Holes in leaves and chewing of all but the leaf veins are signs of feeding damage. These beetles are active at night and will not be present during the day. Look for beetles beginning about 30 minutes after sunset. The beetles are sturdy, pale reddish brown, and about ½ inch long. The body is densely covered with minute hairs, which may give it a grayish appearance.

Hosts

The plant host range for this species comprises over 250 plants from a wide variety of ornamental and cultivated crops, including asparagus, beans, broccoli, cabbage, cacao, Chinese broccoli, Chinese cabbage, chiso, corn, cotton, cucumber, eggplant, flowering white cabbage, ginger, grape, green bean, okra, rose, soybean, strawberry, sweetpotato, and tea.

Life cycle

The larval stages are commonly found in the soil of lawns and gardens where organic matter is present. The grubs are thought to feed on organic matter and do not attack plants. Eggs are laid in soil about 1½ inches deep. They hatch in about 7–16 days. There are three larval stages. The grubs are whitish with a conspicuous brown head and short legs. When still, they tend to be C-shaped. The larval stage lasts for 3–4 weeks. The pupa is yellowish-white when initially formed and then turns brown. Pupation is completed in 1–2 weeks. Development from egg to adult takes 7–16 weeks, depending on temperature. The life cycle from egg to adult is completed in 6–7 weeks.

Distribution

Originally from Japan and Taiwan, this beetle is widely distributed throughout Southeast Asia and many Pacific islands. Introduced to Hawai'i before 1896, it is now a common pest on all major islands in the state.

Reference

Mau, R.F.L., and J.L. Martin. *Adoretus sinicus* (Burmeister). Crop Knowledge Master. www.extento.hawaii.edu/Kbase/crop/type/adoretus.htm



Chinese rose beetle



Feeding damage on young tea plant



Grub in soil

Mexican leafroller

Amorbia emigratella Busck, Lepidoptera: Tortricidae

Damage

This caterpillar rolls the young leaves at the shoot tips and lives and feeds within. Leaves from damaged shoots have holes and may be distorted. In tea, insect parts may contaminate the harvested product. In addition to damage in the field, this insect can be a pest of cuttings in the nursery.

Identification

Examine the shoot tips for rolled leaves and look for the caterpillar inside. Newly hatched caterpillars are $\frac{1}{8}$ inch long, growing to 1 inch long when fully grown. They have a brownish-yellow head, a light-green body, and a black stripe on the sides behind the eyes. The adult moths are yellowish-brown with a small pointed head. The wingspan of female moths is 1–1 $\frac{1}{2}$ inches. Males are slightly smaller and paler.

Hosts

This pest has a wide host range. It is commonly found on ornamental plants and some fruit trees, but vegetables are not common hosts. Hosts include avocado, broccoli, cacao, citrus, cotton, eggplant, green beans, guava,

macadamia, orchids, papaya, passion fruit, potato, rose, sweetpotato, tea, and tomato. It also attacks many other shrubs, fruit trees, and indigenous Hawaiian plants in the mountains.

Life cycle

Eggs are laid in clusters of 65–120 on the upper surfaces of leaves. There are three or four molts in the larval stage, which is completed in 28–35 days. Pupation occurs within the folded leaf. The adult emerges in about 10 days. The life cycle from egg to adult takes from 48–55 days.

Distribution

This caterpillar has been in Hawai'i since 1900 and has been reported from all major islands except Lāna'i. It also occurs in Mexico and Costa Rica.

Reference

Mau, R.F.L., and J.L. Martin Kessing. 1992. *Amorbia emigratella* (Busck). Crop Knowledge Master. www.extento.hawaii.edu/kbase/crop/type/amorbia.htm



Mexican leafroller caterpillar



Damaged tea shoot tip



Adult moth

Red and black flat mite

Brevipalpus phoenicis (Geijskes), Acari: Tenuipalpidae

Damage

Red and black flat mites feed on plant sap and cause bronzing and/or browning of the leaves. These mites favor the upper leaf surface of mature leaves, and the damage progresses from the lower leaves to the younger leaves. Young plants that are not yet fully established appear to be highly susceptible.

Identification

Clusters of bright reddish orange eggs are more easily seen with the naked eye than any other life stage. Note that other mites found on tea also have reddish eggs. These mites are microscopic—the adult female mite is about a hundredth of an inch long. Populations are primarily composed of females, with males less than 1 percent of the population. A feature distinguishing these mites from other mites is that the body is flattened. Coloration ranges from light to dark green or reddish orange. There are four legs extending forward and four legs extending behind. Depending on temperature, adult females may have a black mark in the shape of an H. The adult male is flat, reddish, more wedge-shaped than the female, and lacks black markings.

Hosts

The red and black flat mite has been recorded on over 65 hosts. In Hawai'i, the red and black flat mite has been reported on anthurium, banana, hemigraphis, lemon, macadamia, orchid, papaya, and passion fruit. In other parts of the world it is common on tea and citrus.

Life cycle

Reproduction primarily occurs without mating. The life stages are egg, larva (six-legged), protonymph, deutonymph, and adult. As observed under laboratory conditions, egg-to-adult timespan has been observed to be as short as 10.6 days at 86°F and as long as 27.3 days at 68°F.

Distribution

This mite was first found in Hawai'i on O'ahu in 1955 and has subsequently been reported on Kaua'i, the Big Island, and Maui. The mite is abundant in areas between sea level and 1000 feet, scarce between 1000 and 2500

feet, and has not been recorded in areas above 2500 feet elevation. It is usually not considered to be a pest of economic importance above 1000 feet.

Reference

Martin Kessing, J.L., and R.F.L. Mau. 1992. *Brevipalpus phoenicis* (Geijskes). Crop Knowledge Master: www.extento.hawaii.edu/Kbase/crop/Type/b_phoeni.htm



Red and black flat mite damage



Red and black flat mite viewed under microscope

A spider mite

(identification pending)

Acari: Tetranychidae

Damage

Leaves of severely damaged plants turn reddish and drop prematurely. Plants may be totally defoliated when populations are very high. The damage progresses from older leaves upward to the younger growth. Although mites and their eggs are present on both leaf surfaces, they appear to prefer the upper leaf surface. Plants in the establishment phase appear to be the most prone to severe damage from this mite.



Spider mites and their eggs

Identification

Mites and their eggs are reddish.

Hosts

Tea; other hosts unknown.

Life cycle

As yet unknown.

Distribution

As yet unknown.



A tea plant severely damaged by spider mites



Plants recovering from defoliation

Broad mite, yellow tea mite

Polyphagotarsonemus latus (Banks),
Acari: Tarsonemidae

Damage

Broad mites feed on plant sap and cause scarring and distortion of the leaves and stems. The scarred tissue may appear to be a greasy darkened discoloration that may later turn to a brown, corky surface on the undersides of leaves. Broad mites appear to favor young growth. Plants in the greenhouse or nursery are highly susceptible.

Identification

Although broad mite eggs are microscopic (0.08 mm long), they are distinct and helpful in identifying broad mite infestations. The clear eggs are oval and have five to six rows of whitish bumps. A good hand lens (at least 10x) is needed to see the eggs.

Hosts

The broad mite attacks many plants including bitter melon, Chinese waxgourd, chiso, chrysanthemum, cucumber, edible gourds, eggplant, green beans, guava, hyotan, macadamia, mango, papaya, passion fruit, pepper, pikake, plumeria, poha, pumpkin, Spanish needle, tomato, watercress, winged bean, and yardlong bean. In temperate and subtropical areas, the broad mite is a pest of greenhouse plants.



Damaged shoot

Life cycle

The life cycle, from egg to adult, is completed in about 4–6 days. The number of eggs laid per female and the population growth are affected by temperature and relative humidity.

Distribution

This mite has a worldwide distribution. It is known to occur in Australia, Asia, Africa, North America, South America, and the Pacific. Countries included in this mite's distribution include American and Western Samoa, Bermuda, Brazil, China, Cook Islands, Guyana, Fiji, India, Japan, Kiribati, Malaysia, Marianas, New Caledonia, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Taiwan, Tonga, Vanuatu, and Wallis. It is present on all the major islands of Hawai'i.

Reference

Martin Kessing, J.L., and R.F.L. Mau, *Polyphagotarsonemus latus* (Banks). 1993. Crop Knowledge Master: www.extento.hawaii.edu/kbase/crop/Type/p_latus.htm



Broad mites and egg



Scarring on leaf undersides

Mining scale

Howardia biclavis (Comstock),
Homoptera: Diaspididae

Damage

In general, feeding by these insects on the juices of its host plant causes loss of vigor, deformation of infested plant parts, and even death of the plant. In tea plants, this scale has been mostly found on the bark of the trunk.

Identification

On tea plants, these scales appear to favor living on the bark of the trunk and stems. The scales are round and slightly dome-shaped and may measure up to $\frac{1}{8}$ inch in diameter. The color is variable from white to gray or yellow. A reddish spot is located at or near to the edge of the margin of the armor. This species is called the mining scale because it may burrow beneath the host plant's epidermis and be partially concealed by it. They are a transparent light or yellowish brown.

Hosts

In Hawai'i it has been recorded on acacia, allamanda, bougainvillea, cassia, ficus, ebony, gardenia, hibiscus, ixora, jasmine, lantana, lychee, mango, papaya, plumeria, poinsettia, pulasan, sapodilla, sapote, *Sterculia foetida*, and tea. Among its many other hosts are albizia, kukui, annona, camellia, citrus, coffee, tomato, and macadamia.

Life cycle

Males have not been observed, and parthenogenesis (females producing females) is suspected. The first nymphal stage is commonly called the crawler stage, and it is at this early stage that the insect is mobile on the plant and can be transported to other plants by people, animals, birds, ants, and wind currents. The life cycle is probably about 30 days, based on the generalized life history of other tropical armored scale species.

Distribution

The mining scale was first reported from Kona on Hawai'i in 1895. It has since been recorded from Ni'ihau, O'ahu, and Maui. Worldwide, the mining scale is found in the tropics and in glasshouses in temperate areas.

References

- Tenbrink, V.L., and A.H. Hara. *Howardia biclavis* (Comstock), Crop Knowledge Master. www.extento.hawaii.edu/Kbase/Crop/Type/h_biclav.htm
- Watson, G.W. 2005. Arthropods of economic importance —Diaspididae of the world. <http://ip30.eti.uva.nl/bis/diaspididae.php?selected=beschrijving&menuentry=soorten&id=102>



Mining scales on bark of tea plant

Avocado scale

Fiorinia fioriniae (Targioni-Tozzetti),
Homoptera: Diaspididae

Damage

This scale often causes yellow spotting on the leaves where it feeds on plant sap, due to its toxic saliva. This insect is a pest of tea both in the nursery and in the field.

Identification

Look for the scales on the leaves, especially along the veins. The scales are small: 1–1.5 mm long. They are transparent and light or yellowish brown.

Hosts

In Hawai'i this scale was first reported on tea on Maui in 1997. Elsewhere, it has been recorded on tea, avocado,

anthurium, *Araucaria*, *Buchanania*, *Callistemon lanceolatus*, *Cinnamomum*, *Citrus* spp., coconut, *Cupressus*, *Cycas*, *Decaspermum*, *Dictyosperma*, *Eucalyptus*, *Eugenia*, *Ficus* spp., *Hedera*, *Howea*, *Lauris nobilis*, *Livistona*, mango, *Myristica*, olive, *Phoenix*, *Pinus*, *Podocarpus*, *Salix*, *Santalum*, *Sida*, *Taxus*, *Ulmus*, and others.

Reference

Watson, G.W. 2005. Arthropods of economic importance—Diaspididae of the world. <http://ip30.eti.uva.nl/bis/diaspididae.php?selected=beschrijving&menuentry=soorten&id=102>



Yellowing caused by feeding damage



Avocado scales on tea leaf

Florida red scale

Chrysomphalus aonidum (Linnaeus),
Homoptera: Diaspididae

Damage

The Florida red scale mainly infests leaves, where it feeds on plant sap, but it may spread to other plant parts when its population is very high. Severely infested leaves may drop prematurely. Dry weather conditions favor infestation.

Identification

From a distance, the scales appear as dark circular spots on leaves, especially on the lower leaf surfaces. Closer examination with a hand lens will reveal more detail. Adult female scales are conical and up to 2 mm in diameter. The area near the tip of the cone may appear pale. Immature male scales are smaller and paler than female scales. They are elongate-oval and half the size of adult females. Adult male scales are winged insects that look very different from adult female scales.

Hosts

Hosts recorded in Hawai'i include citrus, coconut, anthurium, bougainvillea, dendrobium, dracaena, eucalyptus, ficus, hibiscus, palm, plumeria, podocarpus, bird of paradise (*Strelitzia*), ginger (*Zingiber officinale*), *Citrus* spp. (lime, lemon, pummelo, grapefruit), asparagus, tea, apple, mango, banana and plantain, palms, and pines.



Florida red scales on tea leaf

Life cycle

Reproduction is sexual. Each adult female lays about 50–150 eggs. The eggs hatch under the female scale, and these crawlers seek a suitable feeding site to settle. Development from egg to adult takes 7–16 weeks, depending on temperature.

Distribution

In Hawai'i, the Florida red scale was first reported from Oahu in 1907. It has since been recorded from the Big Island, Lāna'i, and Kaua'i. The Florida red scale is very widely distributed in the tropics and subtropics. It is present in Europe, Asia, Africa, South America, parts of North America such as Florida, Maryland, Texas, and Virginia, and on many Pacific islands.

References

- Heu, R.A. 2005. Agricultural pests, related organisms and purposely introduced natural enemies in Hawaii. Biological Control Section, Hawai'i Department of Agriculture.
- Watson, G.W. 2005. Arthropods of economic importance—Diaspididae of the world. <http://ip30.eti.uva.nl/bis/diaspididae.php?selected=beschrijving&menuentry=soorten&id=102>



Close up of Florida red scales
(note the yellow crawlers)

Brown soft scale

Coccus hesperidum Linnaeus, Homoptera: Coccidae

Damage

Soft scales feed on plant sap and excrete honeydew, a sugar-rich substance that is fed on by ants and is a substrate for the sooty mold fungus.

Identification

Adult female scales are pale yellowish brown to greenish. The color may darken with age. They are $\frac{1}{8}$ – $\frac{1}{6}$ inch long. Male scales have not been recorded for this species.

Hosts

The brown soft scale attacks a variety of field, ornamental, and greenhouse crops. Host plants reported in Hawai'i include citrus, iliahi, loquat, orchids, papaya, and tea.

Life cycle

Brown soft scales reproduce primarily by parthenogenesis (females producing females without mating) and live birth. It makes up for its relatively slow growth by producing large numbers of offspring (80–250 eggs per female). The first stage is tiny crawlers, which are the dispersive stage. The nymphs undergo three molts before they become adults. The adult female scales are immobile.

Distribution

The brown soft scale was first recorded in Hawai'i in 1896 and is found on all the main islands. It has been reported in Algeria, Australia, Austria, British Guiana, Canada, Chile, Cuba, Dutch East Indies, Ecuador, England, Europe, Haiti, Japan, Mauritius, Mexico, Morocco, New Zealand, Seychelles, South Africa, and West Indies.

Reference

Tenbrink, V.L., and A.H. Hara. 1994. *Howardia biclavis* (Comstock). Crop Knowledge Master. www.extento.hawaii.edu/Kbase/Crop/Type/h_biclav.htm



Brown soft scales on a tea leaf

Melon aphid (cotton aphid)

Aphis gossypii Glover, Homoptera: Aphididae

Damage

Melon aphids have piercing-sucking mouthparts that enable them to feed on plant sap. These aphids excrete honeydew, which is a sweet, sticky substance that can become deposited on infested plants. Honeydew is attractive to ants and is a substrate for sooty mold fungus. Sooty mold blackens the leaf surface and may decrease photosynthesis. Infested leaves may become cupped and distorted. Melon aphids commonly infest the tea shoot, and their body parts may end up in the finished product.

Identification

Melon aphids are soft-bodied insects that vary in color from black to dark brown to brownish green to yellowish green. They are usually $\frac{1}{16}$ inch or less in size. Adults may be winged or wingless. On tea, they often live in groups on the underside of leaves at the shoot tips.

Hosts

The melon aphid attacks a wide variety of plants including many cucurbit vegetables, eggplant, guava, hibiscus, orchids, peppers, taro, and weeds such as lamb's quarters, cheeseweed, and Spanish needle.

Life cycle

In Hawai'i, melon aphids are females that reproduce without mating. They do not lay eggs, but instead produce live nymphs. There are four nymphal stages separated by molts. The nymphs become adults in 4–12 days, depending on temperature. Adult aphids are generally wingless, but overcrowding or decline of the host plant can trigger production of winged forms. Adult aphids may live for 3–4 weeks and produce about 85 offspring each.

Distribution

Melon aphids occur in tropical and temperate regions throughout the world, except for the northernmost regions. In Hawai'i it was first reported on Oahu in 1909 and is now present on all islands.

Reference

Martin-Kessing, J.L., and R.F.L. Mau. 1991. *Aphis gossypii* (Glover). Crop Knowledge Master. http://www.extento.hawaii.edu/Kbase/crop/Type/aphis_g.htm



Melon aphids on tea shoot

Spiraling whitefly

Aleurodicus dispersus Russell,
Homoptera: Aleyrodidae

Damage

It is common to find the waxy spirals made by whiteflies on the undersides of tea leaves. However, because the amount of whiteflies is usually kept at low levels, this insect is likely to be only a minor pest of tea in Hawai'i. Whiteflies feed on plant sap and secrete honeydew and a white, waxy material. Honeydew can serve as a substrate for the sooty mold fungus.

Identification

Eggs are laid in waxy spirals that give this whitefly their common name (see photo). When magnified, whitefly adults somewhat resemble tiny moths. Adult spiraling whiteflies are relatively large compared to other common whiteflies and measure 2–3 mm in length. Larval and pupal stages secrete a waxy material that may be in the form of rod-like projections that appear fluffy. Laboratory identification is often based on taxonomic characters found on the pupal stage.

Hosts

The spiraling whitefly has a wide host range and has been recorded from over 100 plant species. It is common to find this whitefly on various ornamental, fruit, and shade tree crops in Hawai'i. Some common host plants include *Annona* sp., avocado, banana, bird-of-paradise, breadfruit, citrus, coconut, eggplant, guava, kamani, Indian banyan, macadamia, mango, palm, paperbark, papaya, pepper, pikake, plumeria, poinsettia, rose, sea grape, ti, and tropical almond.

Life cycle

The life stages are egg, three larval stages, pupal stage, and adult. Eggs are elliptical, yellow to tan, and are laid in groups of a few to several dozen in spiraling, waxy lines on the leaf underside. Eggs hatch in 9–11 days. The first larval stage is sometimes called the crawler stage and is the only immature stage with functional legs that enable mobility. The second and third larval stages are sedentary, and waxy material is secreted. The third larval stage molts into the pupal stage. Pupae are white to yellowish, nearly oval

Distribution

The spiraling whitefly is native to the Caribbean region and has spread to Africa, Australia, Bahamas, Barbados, Brazil, Canary Islands, Costa Rica, Cuba, Dominica, Ecuador, Haiti, India, Martinique, Panama, Peru, Philippines, Republic of Maldives, Singapore, Sri Lanka, Thailand, USA, Vietnam, and the West Indies. In the Pacific it is present in American Samoa, Cook Islands, Fiji, Hawai'i, Kiribati, Majuro, Mariana Islands, Nauru, Palau, Papua New Guinea, Pohnpei, Tokelau, Tonga, and Western Samoa. This whitefly was first reported in Hawai'i in 1978 on O'ahu and had spread to all the major islands by 1981. It is most abundant in coastal areas and elevations below 1000 feet.

Reference

Martin Kessing, J.L., and R.F.L. Mau. 1993. *Aleurodicus dispersus* (Russell). Crop Knowledge Master. www.extento.hawaii.edu/kbase/Crop/Type/a_disper.htm



Spiraling whitefly adults, larvae, and pupae



Whitefly eggs in waxy "spiral"

Twospotted leafhopper

Sophonia rufofascia (Kuoh & Kuoh),
Homoptera: Cicadellidae

Damage

The twospotted leafhopper uses piercing-sucking type mouthparts to feed on plant sap. Although both nymphs and adults are often associated with tea plants in Hawai'i, the importance of this insect to tea crops is yet unknown. In some other plants, this insect is known to cause injury by injecting saliva into the plant while feeding. Symptoms of plant reaction to the saliva include leaf yellowing, formation of brown or black patches on the leaves, leaf distortion, and stunting of the plant.

Identification

Adult leafhoppers are about $\frac{3}{16}$ inch long and are yellowish, with a dark stripe with red markings through the middle of the body and two dark spots on the posterior end. Nymphs are smaller, do not have wings, and cannot fly. Nymphs are translucent yellow and have two dark spots on the posterior end. The skin that is cast upon molting has the dark spots also. These cast skins tend to remain on the leaves for some time and can be useful for determining the presence of the pest.

Hosts

This leafhopper attacks over 300 species of plants including many fruit, vegetable, and ornamental crops as well as endemic plants. A few examples include avocado, guava, chili peppers, sweetpotato, ti, octopus plant, uluhe fern, and mamaki.

Life cycle

The eggs are laid in plant tissue and are very difficult to detect. Eggs take about 4 weeks to hatch. There are four nymphal stages which last a total of about 7–8 weeks.

Distribution

This species was originally described in southern China. It was first discovered in the state on O'ahu in 1987 and has since spread to all the major Hawaiian islands.

References

- Jones, V.P., M.T. Fukada, D.E. Ullman, J.S. Hu, and W.B. Borth. *Sophonia rufofascia* The two spotted leafhopper. Crop Knowledge Master. www.extento.hawaii.edu/kbase/Crop/Type/s_rufofa.htm
- Duan, J. and R. Messing. Biological control of the two-spotted leafhopper. www2.ctahr.hawaii.edu/t-star/leafhopper.htm



Twospotted leafhopper adult



Cast skin (note spots)



Nymphal stage

Transparentwinged plant bug

Hyalopeplus pellucidus (Stål), Heteroptera: Miridae

Damage

Transparentwinged plant bugs are frequently associated with tea plants in Hawai'i, but it is not known if this insect is a pest of tea. It is a serious pest of guava in Hawai'i, where its feeding and egg-laying into flower buds causes bud drop. On guava, this insect prefers to feed on the corolla region of the flower bud, where it results in a necrotic blackening of the anthers within the bud. It is thought that salivary enzymes are involved in the plant damage.

Identification

Adults are $\frac{1}{3}$ – $\frac{2}{5}$ inch long. The transparentwinged plant bug is perhaps the largest species from the family Miridae in Hawai'i. The adult has smoky colored wings that are folded over the back when at rest. Nymphal stages are pale, translucent green with purplish-red or pinkish-red specks on the abdomen and heads shaped similar to that of the adults, one-half wider than long, and with the vertex being wider than the eyes together. Black bristly hairs over an undercoat of golden yellow hairs cover the head and antennae. The second antennal segment is three times the length of the first and twice as long as the third.

Hosts

This insect has been collected from *Acacia koa*, avocado, coffee, *Coprosoma*, *Dodonaea*, guava, *Hibiscus* sp., rose flowered jathropha, *Metrosideros*, *Pipturis*, *Psidium cattleianum*, *Sida*, *Straussia*, and *Trema orientalis* (charcoal tree).

Life cycle

The life stages are egg, five nymphal stages, and the adult stage. The eggs hatch in 6–8 days after being laid (inserted into plant tissue). The duration of the nymphal stages is about 14 days.

Distribution

The transparentwinged plant bug was first reported in Hawai'i in 1902 and occurs on all of the major islands from sea level to the mountains. This insect might be endemic to Hawai'i.

Reference

Mau, R.F.L., and J.L. Martin. 1992. *Hyalopeplus pellucidus* (Stål). Crop Knowledge Master. www.extento.hawaii.edu/Kbase/Crop/Type/h_pelluc.htm



Adult transparentwinged plant bug

Greenhouse thrips

Heliethrips haemorrhoidalis (Bouche'),
Thysanoptera: Thripidae

Damage

This insect appears to be only a minor pest of tea in Hawai'i. Greenhouse thrips feed on plant sap, and the damage causes a silvering of the leaf. These thrips appear to prefer living and feeding on the undersides of the older leaves of a tea plant. They cause a characteristic fecal spotting, which appears as dark specks on the leaf. These insects prefer to live in the shady areas of the tea tree canopy and do not appear to damage the tea shoot.

Identification

On the plant, check for silvering and fecal spotting, especially on the undersides of older leaves. Mature larvae and adult thrips are about 1 mm in length. Larvae are yellowish, and adults are mostly black with light yellow legs. Definitive identification can be done by an insect diagnostic laboratory.

Hosts

In Hawai'i the greenhouse thrips has been reported on various ornamentals and conifers. Elsewhere, it has been recorded on plants such as ardisia, *Aspidium* sp., avocado, azalea, *Coleus* sp., *Crinum* sp., croton, dahlia, dogwood, ferns, guava, hibiscus, magnolia, mango, natal plum, orange, phlox, and viburnum.

Life cycle

The greenhouse thrips is parthenogenetic (females reproduce without mating). Eggs are laid singly in plant tissue. There are two larval instars, which are the feeding stages. The larval stage is then followed by a prepupal and a pupal stage, during which the insect does not feed. The pupal stage molts into the adult stage. The adult stage has fully formed wings and is capable of flight.

Distribution

The greenhouse thrips was first reported in Hawai'i in 1910 from O'ahu and has since been found on all the major islands except Lāna'i. It is thought to have originated in tropical America. It is found in Brazil, the West Indies, and Central America. It occurs in the U.S. mainland outdoors in Florida and southern California. It is found in greenhouses throughout the mainland. It

is found in Europe in Germany, England, France, Italy, Vienna, Finland, Palestine, and North Africa. This species is thought to be found throughout the world because of its habit of living in greenhouses.

References

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Thrips damage on leaf underside



Adult greenhouse thrips