Eutetranychus orientalis

Scientific Name
Eutetranychus orientalis Klein

Synonyms:
Anychus orientalis, Anychus ricini, Eutetranychus monodi, Eutetranychus sudanicaus, Eutetranychus anneckei, Anychus latus, Eutetranychus latus

Common Name(s)
Citrus brown mite, oriental mite, oriental red mite, oriental spider mite

Type of Pest
Mite

Taxonomic Position
Class: Arachnida, **Order:** Acarina, **Family:** Tetranychidae

Reason for Inclusion in Manual
CAPS Target: AHP Prioritized Pest List - 2009

Pest Description
The genus *Eutetranychus* is characterized by its empodium, which is reduced to a small protuberance (Avidov and Harper, 1969). The life cycle of *E. orientalis* is completed in four active (larva, protonymph, deutonymph, and adult) and three quiescent stages (nymphochrysalis, deutochrysalis, and teleochrysalis) (Lal, 1977).

Eggs: The eggs of *E. orientalis* are oval or circular (Fig. 1) and flattened, coming to a point dorsally, but lacking the long dorsal stalk of other spider mites. Newly laid, the eggs are bright and hyaline, but later they take on a yellow, parchment-like color (Smith-Meyer, 1981). Diameter of the eggs is 0.14 mm (Avidov and Harper, 1969).

Figure 1. Eggs (left) and adult (right) of *E. orientalis*. Photos courtesy of Pedro Torrent Chocarro.

Larvae: Average size of the larva of *E. orientalis* is 190 x 120 µm. The abdomen of female larvae and nymphs is greenish brown, while the abdomen of male larvae is reddish brown. The protonymph is pale-brown to light-green, with legs shorter than the

body, average size 240 x 140 µm. The deutonymph is pale-brown to light-green, average size 300 x 220 µm.

Adults: Adult female *E. orientalis* are broad, oval and flattened. They vary in color from pale brown through brownish-green to dark green with darker spots within the body. The legs are about as long as the body and are yellow-brown (Fig. 1). Average size is 410 x 280 µm. Adult male *E. orientalis* are much smaller than the females. They are elongate and triangular in shape with long legs (leg about 1.5 x body length). The body setae are short and cannot be seen with a 10x lens (Dhooria and Butani, 1984; Smith-Meyer, 1981).

Technical description: Empodia lacking on all tarsi; true claws slender, padlike, each with pair of tenent hairs; duplex setae of tarsi loosely associated, not paired as in other spider mites; 2 pairs of anal setae; 3 pairs of dorsal propodosomal setae, and 10 pairs of dorsal hysterosomal setae, all setae stout, serrate; dorsal striae of hysterosoma form V-pattern between setae D1 and E1, and setal bases E1 and F1 form a square; setal cout (solenidia or sensory rodlike setae in parentheses) of legs (Meyer, 1974). L coxa 2-1-1-1, trochanter 1-1-1-1, femur (8-6-3/4-1/2), genu (5-5-2-2), tibia 9(1/4)-6(0/2)-6(0/1)-7, and tarsus 15(3)-13(1/2)-10(1)-10(1).

Adult male *E. orientalis* are much smaller than the females. They are elongate and triangular in shape with long legs (leg about 1.5 x body length). Usually males have a higher solenidia count.

Short setae are found on legs and body of both sexes at all stages. The body setae are short, however, and cannot be seen with a 10x lens (Smith-Meyer, 1981; Dhooria and Butani, 1984).

The outstanding characteristic in the adult is that the legs are equal to, or longer than, the body length (Avidov and Harper, 1969).

Symptoms/Signs

Eutetranychus orientalis begins feeding on the upper side of the leaf along the midrib and then spreads to the lateral veins, causing the leaves to become chlorotic. Pale yellow streaks develop along the midrib and veins (Fig. 2) initially, which later progress to a grayish or silvery appearance of the leaves. At times, the leaves appear to be

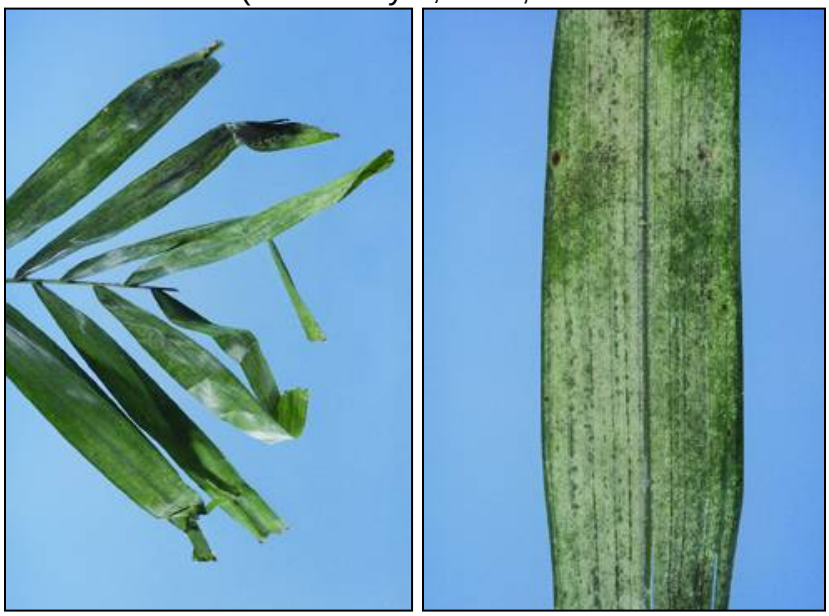

Figure 2. *Eutetranychus* feeding damage on *Ptychosperma* palm. Photos courtesy of http://www.pestalert.org/viewArchPestAlert.cfm?rid=62.

covered in a layer of fine dust. When damaged, the younger, tender leaves show margins that are twisted upwards. Usually, little webbing is produced but can occur. In heavier infestations, the mites feed and oviposit over the whole upper surface of the leaf. Very heavy infestations on citrus cause leaf fall and die-back of branches, which may result in defoliated trees. Lower populations in dry areas can produce the same effect.

Survey

CAPS-Approved Method*: Visual survey is the method to survey for *E. orientalis.*

*For the most up-to-date methods for survey and identification, see Approved Methods on the CAPS Resource and Collaboration Site, at http://caps.ceris.purdue.edu/.

Literature-Based Methods:

Visual survey: The presence of *E. orientalis* can be detected by discoloration of the host leaves and pale-yellow streaks along the midribs and veins. Eggs, immature stages, and adults may be observed visually on the upper leaf surface. Adult females are larger than the males. They are oval and flattened and are often pale brown through brownish-green to dark green. Webbing is possible (often dust colored), providing protection for the eggs. The spread of the mite is windborne, and new infestations commonly occur at the field perimeters. Field perimeters should, therefore, be scouted, especially field perimeters facing prevailing winds. Studies indicate that alfalfa plays a role in dispersing tetranychid mites to other crops (Osman, 1976). Fields near alfalfa should be targeted for survey. Shake leaves above white paper or cloth, and use a hand lens to observe mites.

Surveys should be focused where the greatest risk for establishment occurs. A recent risk analysis by USDA-APHIS-PPQ-CPHST indicates that most states in the United States are at low to moderate risk for *E. orientalis* establishment based on climate and host availability. Florida, however, has a moderate to high risk for establishment of this mite. Establishment of *E. orientalis* is unlikely in portions of Colorado, Idaho, Indiana, Iowa, Kansas, Louisiana, Minnesota, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming.

Hall (1992) discusses sampling strategies for spider mites in orange groves. The author's sampling method consisted of examining 16 leaves per tree, 5 trees within a small area of trees, and 3 areas per block. The leaves were collected by gently pulling four leaves from each of the north, east, south, and west sides of a tree. The leaves from each side of the tree were placed into separate plastic bags. The bags were placed in a cold ice chest, taken to the laboratory, and examined under a microscope to count the number of spider mites present per leaf (both surfaces).

Gilstrap and Browing (1983) recommend using a liquid sampling procedure for leaf collecting of mites, where leaves are placed in a jar filled with 0.5% liquid dishwashing soap and 0.5% standard bleach (5% NaCl) (each % by volume) in a solvent of distilled water. The liquid soap is used to break up surface tension; while the bleach is used to

dissolve any webbing. The author showed that the liquid sampling procedure collected more mites than more mites than the 'normal procedure'. In the 'normal procedure', leaves are placed in a paper bag and a mite brushing machine is used to dislodge mites from the samples when processed the next day. Dhorria et al. (1982) collected forty random leaves (10 leaves/tree) from each almond variety at different heights and all sides of the plants to assess mite resistance. A mite brushing machine was used to dislodge the mites from the leaves on to counting disks.

Key Diagnostics/Identification

CAPS-Approved Method*: Confirmation of *E. orientalis* is by morphological identification. The mite can only be identified by examination of the adult male.

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Literature-Based Methods: According to a NAPPO pest alert, the only form of *E. orientalis* that can be identified is the adult male. Conflicting information states that identification of *E. orientalis* requires examination of cleared and mounted female specimens by transmitted light microscopy.

Mite experts agree that though it may be possible to identify a specimen with a slide mounted female, one can never be 100% sure without a male for confirmation. *E. orientalis* can be easily mistaken for the Texas citrus mite (*E. banksii*). Similarity of the female *E. orientalis* with other tetranychid mites such as the two-spotted mite *(Tetranychus urticae)* can make identification difficult.

References

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