

## Data Sheets on Quarantine Pests

# *Eutetranychus orientalis*

### IDENTITY

**Name:** *Eutetranychus orientalis* (Klein)

**Synonyms:** *Anychus orientalis* Klein  
*Anychus ricini* Rahman & Sapra  
*Eutetranychus monodi* Andre  
*Eutetranychus sudanicus* Elbadry  
*Eutetranychus anneckeii* Meyer

**Taxonomic position:** Arachnida: Acarina: Prostigmata: Tetranychidae

**Common names:** Citrus brown mite, lowveld citrus mite (in South Africa), oriental mite, oriental red mite, citrus mite (English)

**Notes on taxonomy and nomenclature:** The close and confusing similarity between the genus names *Eotetranychus* and *Eutetranychus* causes problems in the literature. The EU Directive refers to this pest as *Eotetranychus orientalis*. This is a misspelling, not a synonym. Pritchard & Baker (1955) considered this species to be a junior synonym of *E. banksi* (McGregor) a species, as now defined, restricted to North, Central and South America. The species concept followed here is that of Smith-Meyer (1987).

**Bayer computer code:** EUTEOR

**EU Annex designation:** II/A1 - as *Eotetranychus orientalis*

### HOSTS

*Citrus* spp. are the main hosts of economic importance. In Egypt, lemons (*C. limon*), mandarins (*C. reticulata*) and oranges (*C. sinensis*) are equally attacked. The mite has been recorded on a wide range of other crops including almonds (*Prunus dulcis*), bananas (*Musa paradisiaca*), cassava (*Manihot esculenta*), cotton (*Gossypium*), figs (*Ficus carica*), guavas (*Psidium guajava*), mulberries (*Morus*), olives (*Olea europaea*), pawpaws (*Carica papaya*), peaches (*Prunus persica*), pears (*Pyrus*), *Plumeria*, quinces (*Cydonia oblonga*), *Ricinus communis*, sunflowers (*Helianthus annuus*), sweet potatoes (*Ipomoea batatas*), watermelons (*Citrullus lanatus*) and over 50 other plant species. The potential host range in the EPPO region concerns essentially citrus.

### GEOGRAPHICAL DISTRIBUTION

This species has a wide distribution in the Old World but it is not clear which is the country of origin.

**EPPO region:** Cyprus, Egypt, Israel (rare), Lebanon, Libya (unconfirmed), Turkey.

**Asia:** Afghanistan, Bangladesh, China, Cyprus, India (Assam, Delhi, Haryana, Karnataka, Kerala, Madhya Pradesh, Meghalaya, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh), Iran, Israel, Jordan, Lebanon, Pakistan, Philippines, Taiwan, Thailand, Turkey, Yemen.

**Africa:** Cape Verde, Egypt, Ethiopia (unconfirmed), Kenya, Libya (unconfirmed), Malawi, Mauritania, Mozambique, Nigeria, Senegal, South Africa, Sudan, Swaziland.

**Oceania:** Australia (Queensland; Walter *et al.*, 1995).

**EU:** Absent.

## **BIOLOGY**

On citrus in South Africa at 27°C and RH 45%, females begin to lay eggs when 1-2 days old along the main vein on the upper surface of the leaf at a rate of 6 eggs per day. Eggs hatch after 5-6 days and the larval, protonymphal and deutonymphal stages each last 1-2 days. The duration of the life cycle in summer is 10-12 days; the male lives for 7-8 days and the female 8-11 days so that 25 generations can occur per year under optimal conditions. Infestation begins in February and the peak is reached between March and April (Smith-Meyer, 1981).

Bodenheimer (1951) quoted in Jeppson *et al.* (1975) reported that, in the Middle East, females lay about 8 eggs per day and, in heavy infestations and during the winter, eggs are laid on both leaf surfaces. The development threshold is 11°C and the thermal constant (when development becomes slower) 26°C. The pre-oviposition period varies from 1-2 days at 23°C to 4-8 days at 15°C. Females live for 12 days in summer to 21 days in winter. Eggs are sensitive to low humidities. Optimum conditions are 21°C and 59-70% RH although development proceeded between 18 and 30°C and between 35 and 72% RH.

In Egypt, Siddig & Elbadry (1971) quoted in Jeppson *et al.* (1975) reported the following average figures for winter and summer, respectively: number of eggs laid per female 22 and 32; egg stage lasts 5.7 and 4.3 days; larva 3.7 and 2.9 days; protonymph 2.4 and 2.2 days; deutonymph female 2.7 and 2.2 days; deutonymph male 2.4 and 2.0 days; pre-oviposition period 2.4 and 1 day; oviposition 12.2 and 10.4 days; post-oviposition 3 and 2.4 days; female lived 15.2 and 12.8 days; male lived 11.9 and 10.3 days; life cycle lasted 14.5 and 11.2 days. There are as many as 27 generations per year.

In 1988-89 in Jordan on lemons, mites were most abundant during late November and December, a season of lower temperatures and increased rainfall. The mites passed late January through February as mature, quiescent fertilized orange-red females. There were 8-10 generations per year (Tanigoshi *et al.*, 1990).

In India, there are usually two population peaks, early May and mid-September, rains during July and August causing a significant reduction in numbers.

## **DETECTION AND IDENTIFICATION**

### **Symptoms**

Mites commence feeding on the upper side of the leaf along the midrib and then spread to the lateral veins, causing the leaves to become chlorotic. Pale-yellow streaks develop along the midrib and veins. Little webbing is produced. 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.

### **Morphology**

#### **Eggs**

Oval or circular and flattened, coming to a point dorsally but lacking the long dorsal stalk of other spider mites. Newly laid, they are bright and hyaline but later take on a yellow, parchment-like colour (Smith-Meyer, 1981).

#### **Larva**

Average size 190 x 120 µm. The protonymph is pale-brown to light-green, 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.

### Adult

Female broad oval, flattened, varying in colour from pale-brown through brownish-green to dark-green with darker spots within the body; legs about as long as the body and yellow-brown. Average size is 410 x 280  $\mu\text{m}$ . Male much smaller than female and elongate triangular in shape with long legs (leg I about 1.5 x body length). The body setae are short and cannot be seen with a x10 lens (Smith-Meyer, 1981; Dhooria & Butani, 1984).

Identification requires examination of cleared and mounted female specimens by transmitted light microscopy. Diagnostic descriptions are given by Jeppson et al. (1975) and Smith-Meyer (1987). *E. orientalis* may be distinguished from other described species of *Eutetranychus* by the following combination of characters: striae on the prodorsum longitudinal and tuberculated; striae between the second ( $d_1$ ) and third ( $e_1$ ) dorsocentral setae longitudinal or V-shaped; the 13 pairs of dorsal body setae all arise from basal tubercles and vary in length and shape; dorsolateral setae on the body ( $c_2$ ), ( $d_2$ ), ( $e_2$ ), ( $f_2$ ), are long, lanceolate and subspatulate or broadly spatulate; dorsocentral setae ( $c_1$ ), ( $d_1$ ), ( $e_1$ ), ( $f_1$ ), ( $h_1$ ) short and spatulate or lanceolate or subspatulate; first pair of dorsocentral setae ( $c_1$ ), first pair of dorsal lateral setae ( $c_2$ ) and humeral setae ( $c_3$ ) all more or less in line; third ( $e_1$ ) and fourth ( $f_1$ ) dorsocentral setae form a square; terminal sensillum (spinneret) of palptarsus 3 times as long as broad; coxa II with one seta; tactile setal formulae (I-IV): femora 8-6-(3-4)-(1-2), genua 5-5-2-2, tibiae 9-6-6-7; chromosome number ( $n$ ) = 3.

### MEANS OF MOVEMENT AND DISPERSAL

Spider mites mainly disperse by wind currents and in the field this is probably the main means of dispersal for *E. orientalis*. In international trade, they might be carried on citrus plants. Since the mites do not infest fruits, these only present a risk if accidentally contaminated by the pest or carrying leaf debris.

### PEST SIGNIFICANCE

#### Economic impact

On citrus, *E. orientalis* is generally regarded as being an important pest. In India, of the seven species reported as pests on citrus, only *E. orientalis* was reported as being a major pest in all areas (Dhooria & Butani, 1984).

#### Control

Acaricides are commonly used against *E. orientalis* and other spider mites on citrus. In Jordan, flubenzimine and omethoate were effective (Sharaf, 1989). In Taiwan, cyhexatin is used to control the pest on carambola (Chang & Leu, 1986). Of nine pesticides tested in India, dicofol (0.025%) and sulfur (0.15%) were found to be the most effective against *E. orientalis* (Deshpande *et al.*, 1988).

The phytoseiid mite, *Euseius scutalis*, widely distributed throughout North Africa, the Middle East, southern Spain and India and known to occur on trees and shrubs of some 29 families, can feed and reproduce on pollen but will also feed on insects and mites. In Jordan, this species has been able to keep *E. orientalis* to non-economic population densities. In Israel, *Amblyseius rubini* and *Euseius hibisci* reproduced when reared on *E. orientalis* and it was the most favoured tetranychid mite offered to the phytoseiids *A. swirskii* and *A. cydnodactylon*, as measured by both the number of attacks and number of eggs laid. Because of the similar leaf colonization, predators that attack *Panonychus citri* might be expected to attack *E. orientalis* also (McMurtry, 1985). The fungus *Hirsutella thompsonii* has been reported parasitizing *E. orientalis* in Israel (Gerson *et al.*, 1979).

### Phytosanitary risk

*E. orientalis* is under consideration by EPPO for the A2 list. It has not been classed as a quarantine pest by any other regional plant protection organization but is of concern to the USA (Baker, 1983). It already occurs in eastern Mediterranean countries and clearly presents a risk for citrus-growing countries in the western Mediterranean area.

### PHYTOSANITARY MEASURES

Importation of citrus plants is prohibited from most non-Euromediterranean sources because of a variety of EPPO A1 pests. From eastern Mediterranean sources, citrus plants should come from a place of production free from, or treated against, the pest, analogous with the measures recommended by EPPO for *Parabemisia myricae* for example (OEPP/EPPO, 1990).

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