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Red and Black Flat Mite, A False Spider Mite, *Brevipalpus phoenics* (Geijskes) (Arachnida: Acari: Tenuipalpidae)[1]

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Introduction

Brevipalpus phoenicis (Geijskes) is a tropical-subtropical species that has been accidentally transported by man to many areas of North America. It survives under greenhouse conditions beyond its natural range. This mite has an extensive host range and may cause economic damage, depending on the host. Mites in the family Tenuipalpidae are called false spider mites (they do not spin a web) or flat mites.

Synonymy

Tenuipalpus phoenicis Geijskes, 1939: 23.

This species was described by Geijskes from specimens collected in a greenhouse in Haag, Holland. Female from Haag, Holland, on *Phoenix* sp., in the Laboratorium von Entomologie, Landbouwhoogeschool, Wageningen, Netherlands.

Figure 1. Adult female false spider mite, *Brevipalpus phoenicis* (Geijskes). Credits: United States Department of Agriculture

Distribution

B. phoenicis has been recorded from Argentina, Australia (as "passionvine mite"), Brazil, Guyana, Cuba, Egypt, Hawaii, Holland, India, Jamaica, Kenya, Malaya, Mauritius, Mexico, Spain, Taiwan, and the United States. It is recorded on the mainland of the United States from California, District of Columbia, and throughout the Florida peninsula.

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Description

Adults: Adult females are about 275 microns long, including the rostrum. The body is flat, light to dark green or reddish orange. A black mark in the shape of an "H" becomes visible when these mites are reared in temperatures between 68°F and 77°F, while this black spot is not present at 86°F (Haramoto 1969). Two pairs of legs extend forward and two pairs extend behind. The two sensory rods on tarsus II separate it from the privet mite, *B. obovatus* Donn., which is often found with it on the same plant.

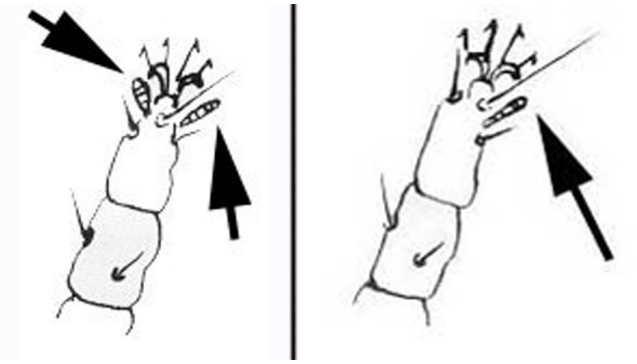

Figure 2. Tarsus II with two sensory rods (left), Tarsus II with one sensory rod (right).

On average, adults lived for a maximum of 47 days at 68°F and a minimum of 7.5 days at 86°F with a relative humidity of 85 to 90 percent (Haramoto 1969).

Duration from egg hatch to adult required a minimum of 10.6 days at 86°F and a maximum of 27.3 days at 68°F under laboratory conditions (Haramoto 1969). Temperatures above 86°F and below 68°F for prolonged periods are fatal to immature stages (Kessing and Mau 1992).

Eggs: Eggs are deposited singly, but often near eggs from the same female, in cracks, crevices and other protected areas on the plant surface. These clusters of bright reddish orange eggs are more easily seen with the naked eye than any other life stage. Eggs have a stipe, a tail-like projection, that extends from the slightly pointed end that came out of the female mite last. This stipe often breaks off if the egg is handled. A day before hatching, the eggs become opaque white and the red eyes of the larvae are visible within (Haramoto 1969).

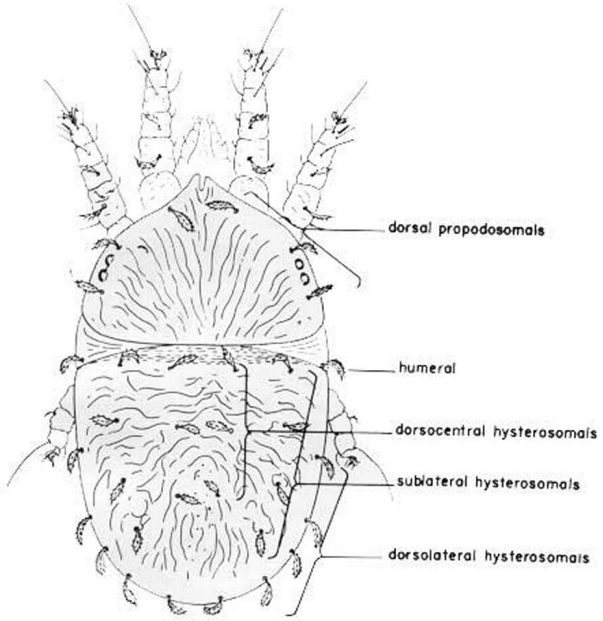

Figure 3. Dorsal view of a typical female false spider mite, *Brevipalpus* sp. Credits: Division of Plant Industry (After Baker)

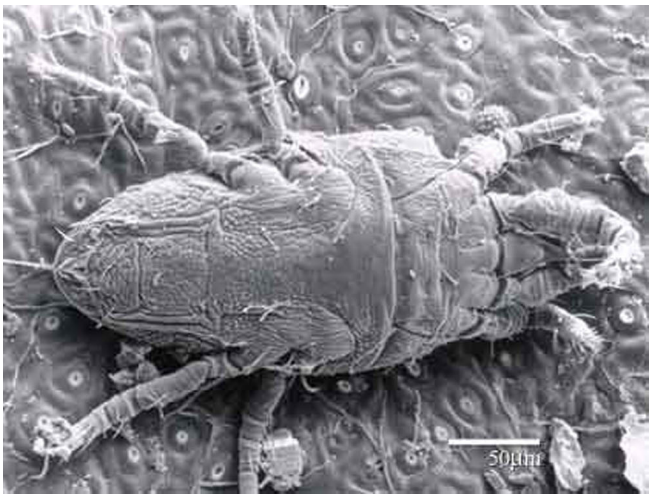

Figure 4. Ventral view of an adult female false spider mite, *Brevipalpus phoenicis* (Geijskes). Credits: United States Department of Agricul

Larvae: Larvae are six-legged, bright orange-red when newly emerged, but turn an opaque-orange when fully grown (Haramoto 1969).

Nymphs: There are two nymphal stages, the protonymph and the deutonymph. The protonymph is larger than the larva and has eight legs. The outer shell is transparent, light green, orange, black and yellow patches may be seen within the body. The deutonymph is similar in appearance to the protonymph except for having an extra pair of legs,

Figure 5. Larva of the false spider mite, *Brevipalpus phoenicis* (Geijskes). Credits: United States Department of Agriculture

Figure 6. Protonymph of the false spider mite, *Brevipalpus phoenicis* (Geijskes). Credits: United States Department of Agriculture

two additional setae (hairs) and being slightly larger (Haramoto 1969).

Hosts

This mite species was reported as having over 65 hosts (Baker and Pritchard 1958), but USDA scientists now say there many be as many as 1,000 hosts (USDA 2004). Only a few major hosts from Florida are given here: Aphelandra, gardenia, grapefruit, hibiscus, holly, ligustrum, lemon, lime, orange, pecan, and viburnum. *B. phoenicis* is the most common false spider mite

Economic Importance

Feeding by this mite devitalizes the plant and causes mesophyll collapse. It is visible on both sides of the leaves. Old damage is characterized by browning of the damaged area. In addition, some hosts exhibit deformed leaves. Symptoms are more prevalent in the spring, summer and fall.

Brevipalpus phoenicis is known to transmit the citrus leprosis virus. Citrus leprosis causes yield reduction and eventual death of the trees if its mite vectors are not controlled. Citrus leprosis, while not currently a problem in the U.S., substantially damaged Florida's orange crop in the early 20th century, but was eradicated in the mid-1920s. However, it is slowly progressing northward from its outbreak epicenter in South America. Only *B. phoenicis* has been experimentally confirmed to transmit citrus leprosis virus. Two closely related species, *B. californicus* and *B. obovatus*, also are suspected transmitters. (USDA 2004).

Management

B. phoenicis has at least four natural predators. Unfortunately, these predators generally fail to provide economic control as predation becomes noticable only after B. phoenicis achieves a very high population density and severe plant damage has already occurred. As a result, other management agents, such as pesticides, are necessary for economic control (Haramoto 1969).

Figure 7. Deutonymph of the false spider mite, *Brevipalpus phoenicis* (Geijskes). Credits: United States Department of Agriculture

In the early part of the 20th century, sulfur was used as a control method for this pest in Florida, but the use of sulfur in today's management programs should be minimized given its toxic effects on beneficial arthropods (Childers et al. 2005).

For more information:

- Florida Citrus Pest Management Guide: rust mites, spider mites, and other phytophagous mites (http://edis.ifas.ufl.edu/CG002)
- False spider mite control measures available to commercial flower producers in Florida (http://edis.ifas.ufl.edu/IN398#TABLE_15)

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