

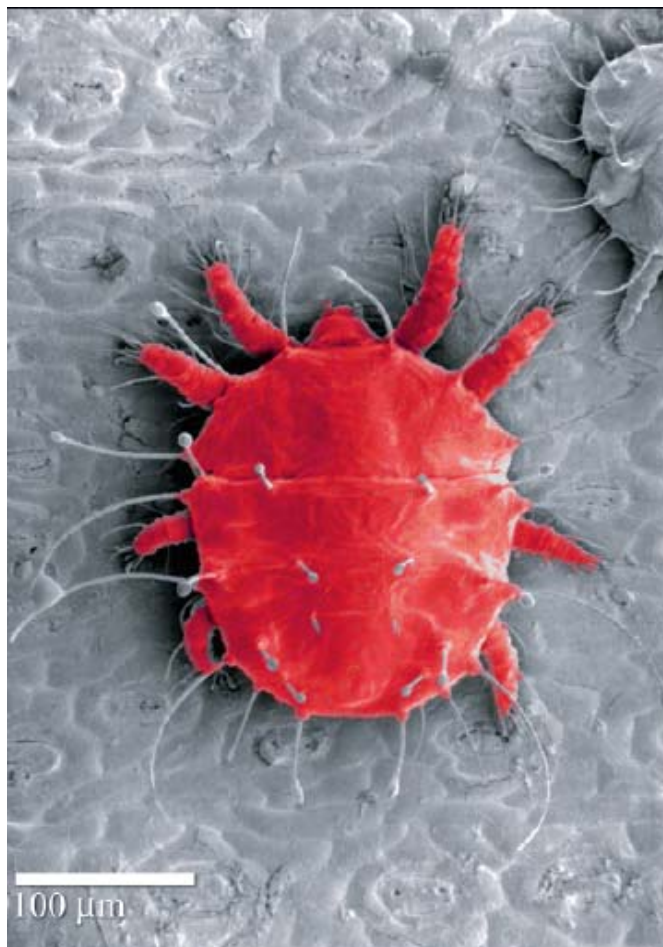


United States Department of Agriculture  
Research, Education, and Economics  
Agricultural Research Service

## Detection & Identification of the Red Palm Mite *Raoiella indica* Hirst (Acari: Tenuipalpidae)

Ethan C. Kane & Ronald Ochoa  
Systematic Entomology Laboratory  
USDA-ARS, Beltsville, MD

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Adult Female, LTSEM

(E. Erbe, E. Kane, & R. Ochoa, USDA-ARS)



Systematic Entomology Laboratory  
Bldg. 005, Rm. 137, BARC-West, USDA-ARS  
10300 Baltimore Avenue, Beltsville, MD 20705 USA

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The first Western Hemisphere records of the Red Palm Mite, *Raoiella indica* Hirst, were reported in 2004 from the island nation of Martinique (Flechtmann & Etienne 2004). Subsequent reports from the Caribbean Region have been confirmed from the islands of Saint Lucia (2005), Dominica (2005), and Trinidad (2006). In all instances, this species has established itself on palm species in the family Arecaceae, with significant outbreaks on Coconut Palms, *Cocos nucifera* L.. In addition, major infestations have been reported on the leaves of banana plants in the family Musaceae on the islands of Dominica and Trinidad.

Prior to its discovery in the Caribbean Region, the Red Palm Mite was known only from tropical and subtropical regions of the Old World where it had been reported as a pest of Coconut, Areca Palm, and Date Palm in India, Sri Lanka, Pakistan, Egypt, Israel, Iran, Mauritius, Sudan, and the Philippines.

Given this mite's explosive appearance in the Caribbean Region, it should be considered a significant pest risk for the subtropical areas of the United States, including Puerto Rico. The purpose of this document is to provide supplemental information to aid PPQ and CBP officers in the detection and identification of this pest species.



(R. Ochoa & G. Mathurin, USDA-ARS & MOA- Saint Lucia)

Figure 1. Red Palm Mite damage to coconut palms on Saint Lucia

### **Host Information:**

The Red Palm Mite has been recorded from a variety of host plants, but primarily from palm species in the families Arecaceae and, more recently, from banana species in the family Musaceae. Table 1 lists the hosts reported in the literature on which the Red Palm Mite, *Raoiella indica*, or closely related species have been found.

Table 1. Reported Host Plants for *Raoiella* spp.

Family	Host Plant
Arecaceae	<i>Aiphanes</i> sp. (Multiple crown palm)
Arecaceae	<i>Areca catechu</i> L.
Arecaceae	<i>Areca</i> sp.
Arecaceae	<i>Cocos nucifera</i> (Coconut)
Arecaceae	<i>Dictyosperma album</i> (Borg.)
Arecaceae	<i>Dypsis lutescens</i> (H.Wendl.)
Arecaceae	<i>Phoenix dactylifera</i> L. (Date palm)
Arecaceae	<i>Syagrus ramanzoffianum</i> Glassman (Queen palm)
Arecaceae	<i>Veitchia merrillii</i> (Becc.)
Celastraceae	<i>Cassine transvaalensis</i>
Lamiaceae	<i>Ocimum basilicum</i> L.
Musaceae	<i>Musa acuminata</i> Colla
Musaceae	<i>Musa balbisiana</i> Colla
Musaceae	<i>Musa uranoscopus</i> Lour.
Musaceae	<i>Musa x paradisiaca</i> L.
Myrtaceae	<i>Eucalyptus</i> spp.
Myrtaceae	<i>Eugenia</i> sp.
Oleaceae	(Olive)
Pandanaceae	<i>Pandanus</i> sp.



(L. McComie, MOA-Trinidad & Tobago)

Figure 2. Red Palm Mite infestation of banana plants, Trinidad

## Symptoms:

The mites are typically found on the undersides of leaves, often in large numbers (~100-300 individuals) and are visible with the naked eye. All life stages are predominantly red, while adult females often exhibit dark areas on the body. The exuvial remains (shed skins) are white and are often more numerous than the living mites in very productive populations.

In high densities, feeding mites cause localized yellowing of the leaves followed by tissue necrosis. Figures 2 and 3 illustrate the various symptoms of an infestation on bananas and coconut palms, respectively.



Figure 3. Red Palm Mite infestation of coconut palms, Trinidad.

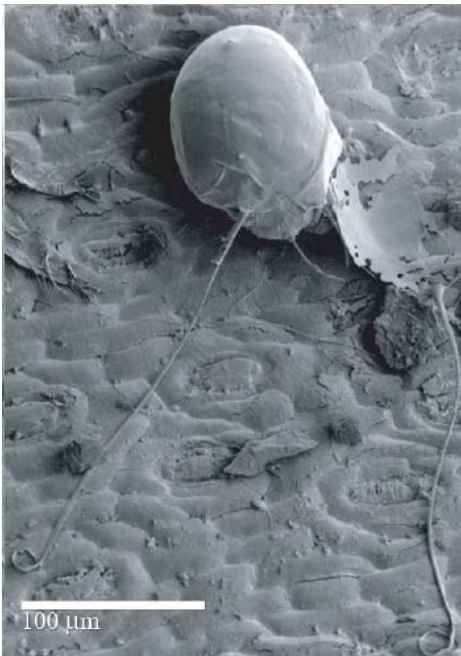
## Description:

The Red Palm Mites superficially resembles spider mite species in the family Tetranychidae; however, their bright red coloration and long spatulate setae are useful characters in distinguishing them from spider mites. All life stages, including the eggs, are red, and the adult females often exhibit darkened areas in their abdomens that appear as black patches across their backs. Adult females have been reported to live for approximately 30 days.

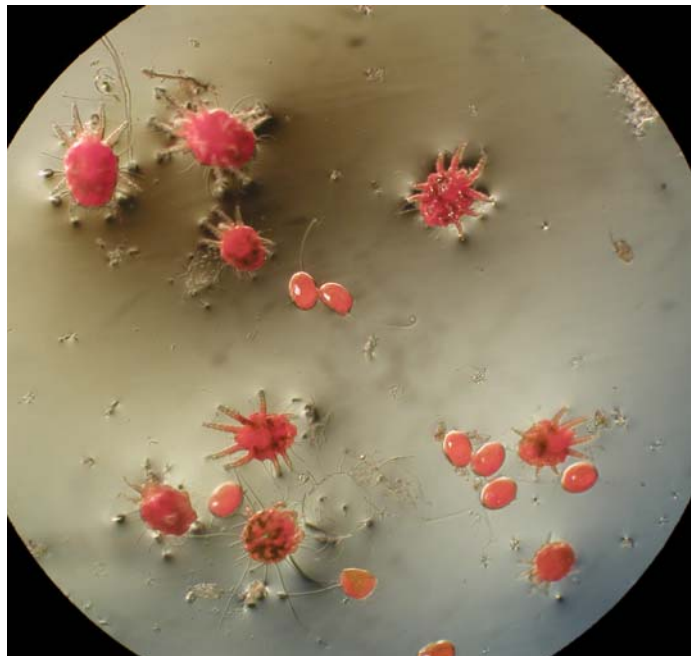
Eggs- The eggs are smooth and are attached to the leaf surface by a slender stipe, or tether, that is about twice as long as the egg itself (Figure 4).

Immatures- The nymphal stages are slightly smaller than the adults and exhibit a smoother integument that lacks the projecting setal bases that are apparent in the adults, and they also have distinctly shorter dorsal and lateral setae.

Adults- As mentioned previously, the adult females often exhibit dark patches on their abdomens. Males are smaller than the females and have a distinctly triangular abdomen that terminates with a complex reproductive organ. The dorsal setae in both sexes arise from projections of the dorsal integument.



4. (E. Erbe, E. Kane, & R. Ochoa, USDA-ARS)



5. (L. McComie, MOA-Trinidad & Tobago)

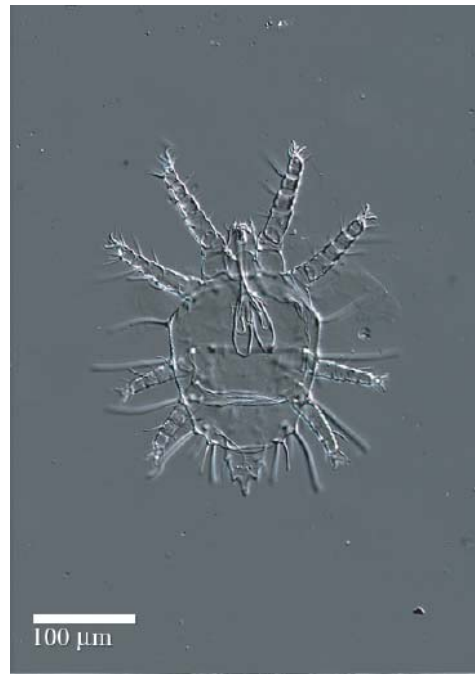
Figure 4- Low temperature scanning electron microscopy image of the egg of *Raoiella indica* Hirst.

Figure 5. Various life stages of the Red Palm Mite, viewed under a stereomicroscope.



A. Female

(E. Kane & R. Ochoa, USDA-ARS)



B. Male

(E. Kane & R. Ochoa, USDA-ARS)

Figure 6. Light microscopy images of the Red Palm Mite

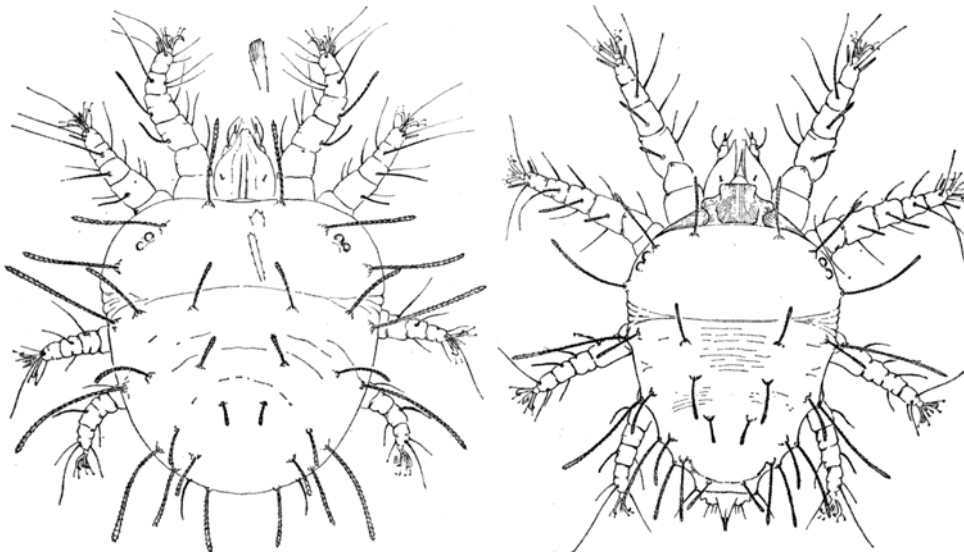


Fig. 47. *Raoiella indica*: dorsal aspects of female and male.

Figure 7. Illustrations of *Raoiella indica* from Pritchard & Baker 1958.

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