

A Stored Products Pest, *Oryzaephilus acuminatus* (Insecta: Coleoptera: Silvanidae)¹

M. C. Thomas and R. E. Woodruff²

The Featured Creatures collection provides in-depth profiles of insects, nematodes, arachnids and other organisms relevant to Florida. These profiles are intended for the use of interested laypersons with some knowledge of biology as well as academic audiences.

Introduction

A commercial nursery in Fort Myers, Florida imported seeds of the neem tree (*Azadirachta indica* A. Juas) from India to be used for their purported insecticidal properties. Beetles were discovered in the storage area on 11 January 1983 and were sent to the Florida Department of Agriculture for identification. They were identified by the senior author as *Oryzaephilus acuminatus* Halstead, constituting the first United States record. Recommendations were immediately made to fumigate the area where the seed was stored in order to prevent establishment of the pest.

A previous shipment of 1,000 kg (~2200 lbs) of the seed was made a year earlier, but no beetles were noted then. The present shipment, consisting of 3,000 kg (~6600 lbs), left India in September 1982, arriving in Los Angeles (San Pedro) on 12 December 1982. It was then shipped to Miami and stored for about three weeks before being shipped to Fort Myers. There it was stored in a room with part of the previous shipment. Thousands of beetles (all stages) were found in the storage area. This area was fumigated, and the surrounding nursery and greenhouse areas were treated. All subsequent inspections were negative (after nine months).

Distribution

Halstead (1980) recorded it from India, Sri Lanka, and England (imported on coconut shells). The discovery of this species in Fort Myers represents the first record of its occurrence outside the Old World (Halstead, personal communication).

Description

Oryzaephilus acuminatus is similar to the other two stored products species of *Oryzaephilus* found in the U.S. Adults are dark brown to black with recumbent golden setae. Males range in length from 3.4-3.7 mm (~ $\frac{1}{8}$ in); females from 3.3-3.5 mm (~ $\frac{1}{8}$ in). Body elongate, parallel sided, ratio of length to width 4.3- 4.4:1 in males, 3.9-4.1:1 in females. Pronotum in large males elongate, 1.5-1.7:1; lateral ridges and anterior pronotal angles strongly developed (all above ratios are from Halstead, 1980). The immature stages have not been described, but larvae resemble those of the saw- toothed grain beetle [*Oryzaephilus surinamensis* (L.)] illustrated by Peterson (1979: fig. C49-A).

In Cutler's (1971) key to the larvae of some economically important silvanids, *Oryzaephilus acuminatus* would key to *Oryzaephilus mercator*, the merchant grain beetle, sharing with that species the possession of 4 long, antero-lateral setae on abdominal tergites 2 to 7.

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2. M. C. Thomas and R. E. Woodruff, Florida Department of Agriculture and Consumer Services, Division of Plant Industry, Gainesville, Florida.

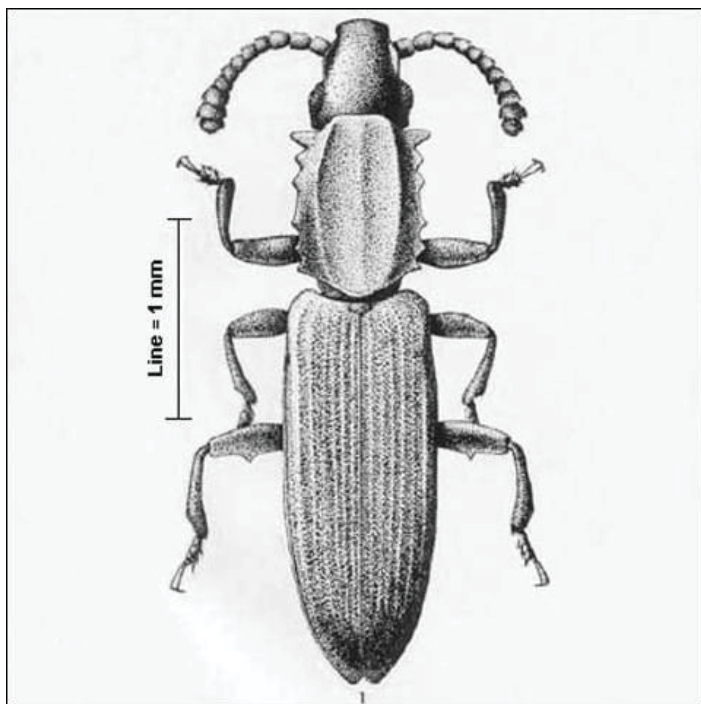


Figure 1. Adult male *Oryzaephilus acuminatus* Halstead, a stored products pest.

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Biology

In the original description, Halstead (1980) reported on crossing experiments among *Oryzaephilus acuminatus*, *Oryzaephilus mercator*, and *Oryzaephilus surinamensis*; *Oryzaephilus acuminatus* and *Oryzaephilus mercator* resulted in a few sterile hybrids; *Oryzaephilus acuminatus* and *Oryzaephilus surinamensis* were entirely unsuccessful. He noted in *Oryzaephilus acuminatus* that: "Its performance in cultures at constant temperatures suggests considerable pest potential." Some paratypes were designated from a culture of specimens collected in England in coconut shells imported from India.

After studying *Oryzaephilus acuminatus* at a variety of temperatures, humidities, and culture media, Jacob (1981) concluded that "... there are good reasons for concluding that *Oryzaephilus acuminatus* will not succeed as a storage pest as well as the other two species. *Oryzaephilus acuminatus* lays fewer eggs and this alone would probably lead to its failure in competition with them. Although it develops on cereals as quickly as *Oryzaephilus mercator*, its low rate of oviposition and considerable mortality of developing larvae and pupae ensure that its potential for increase is less."

Identification Key

Although *Oryzaephilus acuminatus* is superficially similar to both the saw-toothed grain beetle (*Oryzaephilus surinamensis*) and the merchant grain beetle (*Oryzaephilus*

mercator) there are numerous structural differences distinguishing adults of the three species. Both *Oryzaephilus mercator* and *Oryzaephilus acuminatus* have relatively large eyes and short temples, while *Oryzaephilus surinamensis* has small eyes and long temples. Identification of *Oryzaephilus acuminatus* was confirmed by comparison with a paratype in the Florida State Collection of Arthropods. The following key, modified from Halstead (1980), should permit the identification of both sexes of these three species.

Key to the United States Species of *Oryzaephilus*

1. Temple at least one-half length of eye, not sharply angulate behind (Figure 6) *surinamensis* (L.), sawtoothed grain beetle

1'. Temple less than one-third length of eye, sharply angulate behind (Figure 5). . . . 2

2. Anterior pronotal angle moderately developed in large males; body less elongate (3.6-4.1:1); pronotum of large males with lateral ridges not strongly elevated (Figures 2 and 4). . . . *mercator* (Fauvel), merchant grain beetle

2'. Anterior pronotal angles strongly developed in large males; body more elongate (3.9-4.4:1); pronotum of large males with lateral ridges strongly produced (Figure 3) *acuminatus* Halstead, no common name

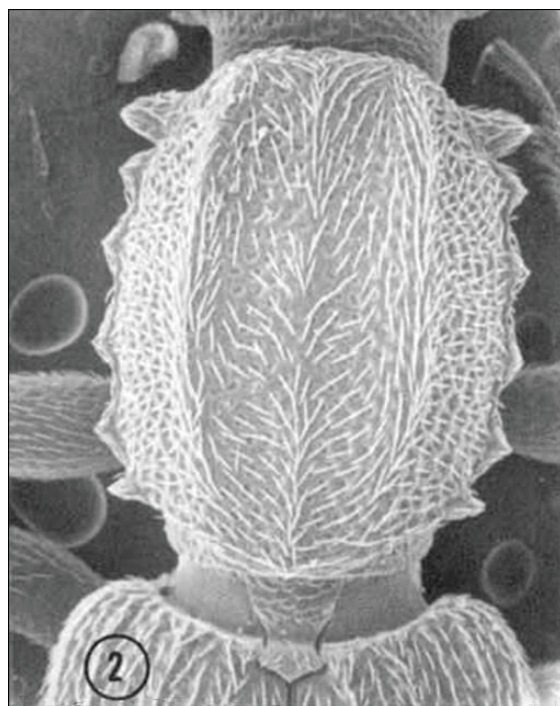


Figure 2. Oblique view of the pronotum of an adult male *Oryzaephilus acuminatus* Halstead, a stored products pest, showing the strongly developed anterior pronotal angles.

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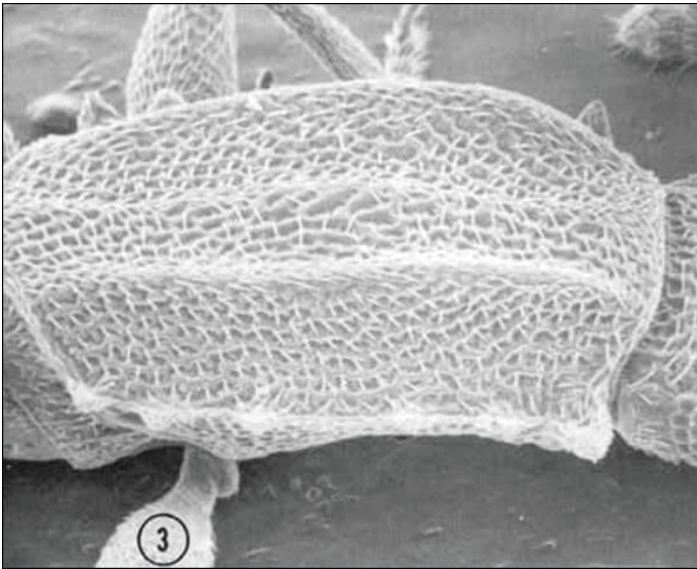


Figure 3. Dorsal view of the pronotum of an adult male *Oryzaephilus mercator* (Fauvel), the merchant grain beetle, showing lesser development of anterior pronotal angles, compared to *Oryzaephilus acuminatus* Halstead.

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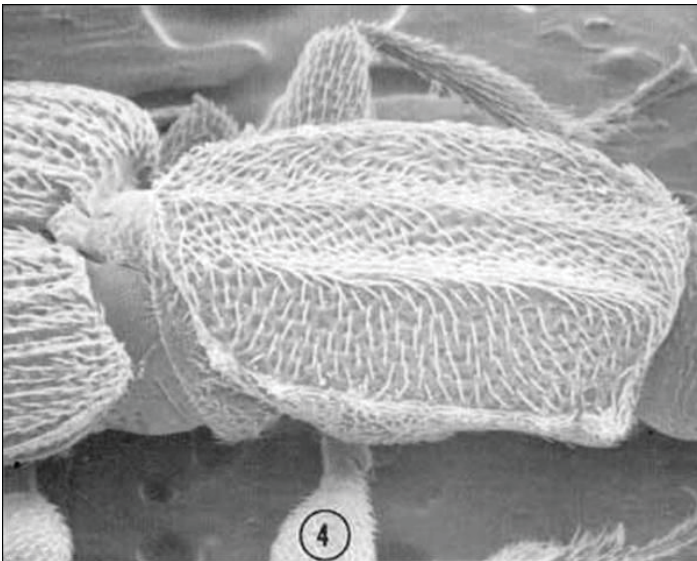


Figure 4. Oblique view of the pronotum of an adult male *Oryzaephilus mercator* (Fauvel), the merchant grain beetle, showing lesser development of anterior pronotal angles, compared to *Oryzaephilus acuminatus* Halstead.

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Male genitalia are also diagnostic for each species (see Halstead 1980).

Hosts

The neem tree (*Azadirachta indica* A. Juas) is primarily Indian in distribution. At least one tree is growing at the USDA Plant Introduction Station in southern Miami. The beetle appears to thrive in dry stored materials, in this case seeds. Although these seeds are reported to have insecticidal properties, the chemical does not appear to be toxic to *Oryzaephilus acuminatus*.

Although some host preferences may exist, it is likely that any stored plant materials could provide sustenance. The British interceptions were in coconut shells, and it was cultured on groundnuts, on copra, and on a mixture of rolled oats, wheatfeed, and yeast in the laboratory. The saw-toothed grain beetle is found in flour, grains, seeds, and many kinds of stored products.

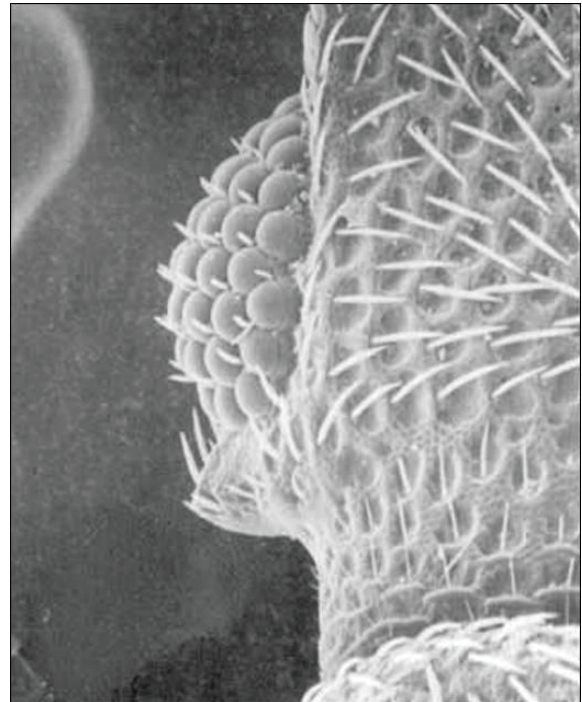


Figure 5. Dorsal view of the left eye and temple of an adult *Oryzaephilus mercator* (Fauvel).

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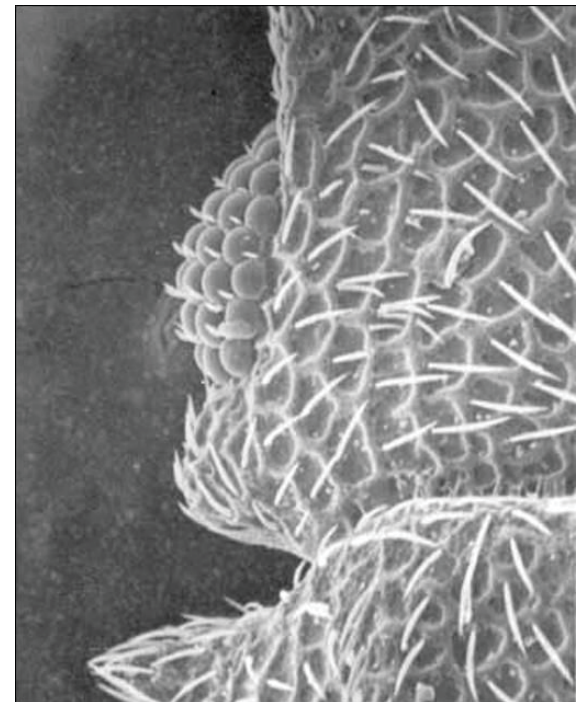


Figure 6. Dorsal view of the left eye and temple of an adult *Oryzaephilus surinamensis* (L.).

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Management

For management information see ENY-213 Pantry and Stored Food Pests (<https://edis.ifas.ufl.edu/ig095>).

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