Silky Cane Weevil, *Metamasius hemipterus sericeus* (Olivier) (Insecta: Coleoptera: Curculionidae)[1]

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Introduction

The silky cane weevil (*Metamasius hemipterus sericeus*) is distributed through the West Indies, Central, and South America (Vaurie 1966), and was first reported in Dade County, Florida in 1984 (Woodruff and Baranowski 1985). In Florida, *M. h. sericeus* is an economically important pest of sugarcane, palms and other tropical plants. Larvae of *M. h. sericeus* are borers that tunnel through plant stems and petioles causing extensive damage.

It was first discovered infesting sugarcane in the Belle Glade, Florida, area by Giblin-Davis et al. (1994) and a heavy infestation was observed by Sosa (1995) about 7 km south of South Bay, FL. A survey conducted by the Florida Sugarcane League and the USDA-ARS indicated that *M. h. sericeus* was widely distributed throughout the sugarcane production areas of Florida planted to cultivar 'CP-85-1382'. *Metamasius h. sericeus* is generally considered a secondary pest of sugarcane and is attracted to stems damaged by mechanical cultivation, harvesting equipment, rats, other borers, disease, or natural growth cracks. Adults of *M. h. sericeus* are most numerous in the spring when they are attracted to a variety of decomposing crops post-harvest, in field margins, or in cull piles. There are no labeled insecticides for **M. h. sericeus** in sugarcane in Florida. Cultural control focuses on the use of cultivars that do not form cracks at their bases. However, many newer cultivars being released for other issues, such as orange-rust resistance, can be prone to cracking, thereby making them very susceptible to *M. h. sericeus* (Gregg Nuessly, pers. comm.).

Host palm damage can be severe in some instances but infestations are rarely lethal. Ornamental crop production represents a 190 million dollar industry in South Florida. Losses in palm nursery production due to weevils, including damage by *M. h. sericeus*, *Rhynchophorus cruentatus,* and *Diaprepes abbreviatus*, are high and contribute to a sizable portion of total pest control costs.

Description

Adults of *M. h. sericeus* vary in color from red to orange and black. In addition, the pattern of coloration on the elytra, pronotum and venter is also variable. The femora are typically red, or red with black patterning. Total length of adults from the tip of the rostrum to the end of the pygidium varies from 9 to 14 mm. Larvae are legless grubs and are creamy to yellowish in color. Their prominent head is reddish-brown and very hard, and they have a ventral posterior protuberance.

1. This document is EENY-053, one of a series of the Department of Entomology and Nematology, UF/IFAS Extension. Original publication date September 1998. Revised August 2007, August 2010, September 2013, and January 2017. Reviewed April 2020. Visit the EDIS website at https://edis.ifas.ufl.edu. This document is also available on the Featured Creatures website at http://entnemdept.ifas.ufl.edu/creatures/.

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Reviewed: 11/2023

Figure 1. Color pattern of the adult silky cane weevil, *Metamasius hemipterus sericeus* (Olivier).
Credits: Robin M. Giblin-Davis, University of Florida

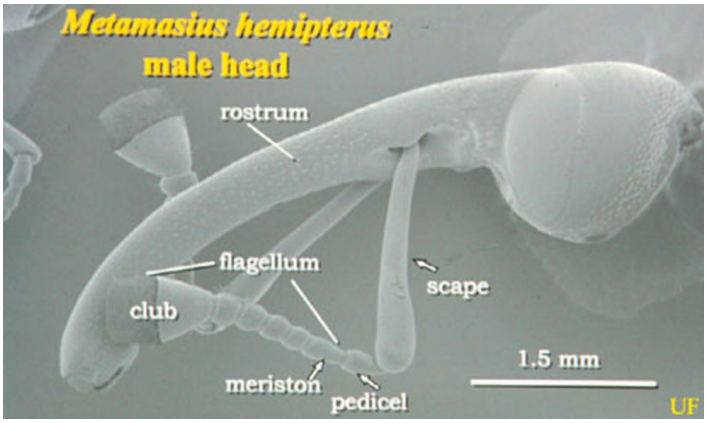

Figure 2. SEM of head of adult male silky cane weevil, *Metamasius hemipterus sericeus* (Olivier).
Credits: Robin M. Giblin-Davis, University of Florida

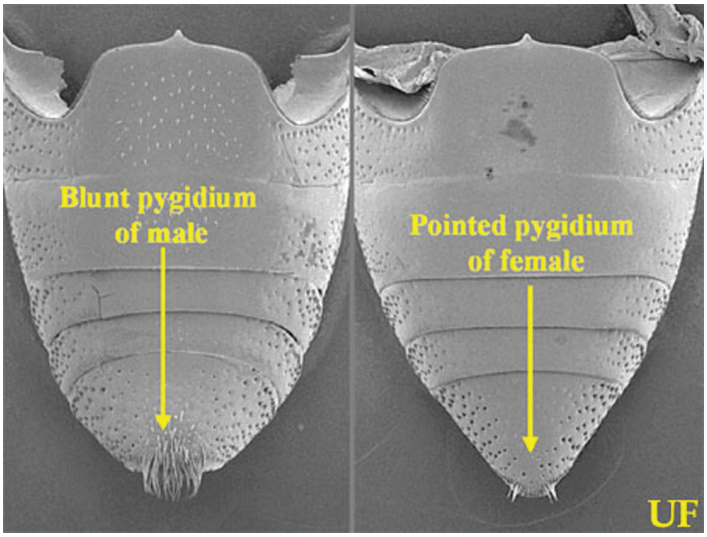

Figure 3. SEM comparison, ventral view of male and female pygidium, of the silky cane weevil, *Metamasius hemipterus sericeus* (Olivier).
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Figure 4. Larva of the silky cane weevil, *Metamasius hemipterus sericeus* (Olivier).
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Life Cycle

Metamasius hemipterus sericeus has a complete life cycle: with an egg, several larval instars, pupal, and adult stages. Adults can live for 60 days and females deposit an average of 500 eggs (Castrillon and Herrera 1980). Females are attracted to and oviposit in damaged or stressed sugarcane stalks, banana pseudostems, ripe fruit (pineapple, mango, papaya), or palm sheaths or stems (Giblin-Davis et al. 1994). Eggs hatch in about four days and begin to feed. In sugarcane, larvae feed in the pith, sometimes boring into healthy tissue. Larval tunneling in palm starts in the petioles, wounds in petioles, crown, or stem and then extends into healthy leaf or stem tissue. After about seven weeks, larvae construct a fibrous pupal case similar to that constructed by *R. cruentatus* (Woodruff and Baranowski 1985). After about 10 days, pupae transform to adults that may immediately break free of the cocoon, or may remain within the cocoon until conditions are favorable for emergence (Woodruff and Baranowski 1985).

The adult stage of *M. h. sericeus* is free living and is often found on or within banana pseudostems, palm fronds, sugarcane sheaths, and leaf litter.

Host Range

Metamasius hemipterus sericeus primarily infests banana and plantain, *Musa* spp., and interspecific hybrids of sugarcane. Infestations have also been observed in several ornamental palms such as Canary Island date palm, *Phoenix canariensis*; MacArthur palm, *Ptychosperma macarthurii*; majesty palm, *Ravenia rivularis*; royal palm, *Roystonia regia*; spindle palm, *Hyophorbe verschaffeltii*; and Washington fan palm, *Washingtonia robusta* (Giblin-Davis et al. 1994, Peña et al. 1995, Vaurie 1966).

Damage

Metamasius hemipterus sericeus is generally considered to be a secondary pest of damaged sugarcane. However, larvae feeding on dead tissue often bore into and feed on healthy material, resulting in significant damage or even cane death. Currently, *M. h. sericeus* in Florida infests 8 to 32% of the 'CP-85-1382' stalks under cultivation. Estimated losses in sugarcane production due to *M. h. sericeus* in Florida have run as high as $402.40/ha, or almost $ 6 million industry-wide (Sosa et al. 1997). Larval tunneling in palm starts in the petioles, wounds in petioles, crown, or stem and then extends into healthy leaf or stem tissue. Affected palms are often characterized by the production of an amber-colored and gummy exudate in the stem, crown shaft or petioles, and galleries in the leaves, petioles and stems (Giblin-Davis et al. 1994). Typically, *M. h. sericeus* infestations in palms are not lethal. However, aesthetic problems are observed, such as exudate running down the palm stem or crown shaft. In addition, palm stress created by *M. h. sericeus* infestation can increase the chances of infestation by the palmetto weevil, *Rhynchophorus cruentatus*. Palmetto weevil infestations can be lethal to palms such as *P. canariensis*. Because *M. h. sericeus* is a borer, it can be easily moved within plants and is considered to be a regulatory problem.

Figure 5. Damage to sugarcane by the silky cane weevil, *Metamasius hemipterus sericeus* (Olivier).
Credits: Robin M. Giblin-Davis, University of Florida

Figure 6. Damage to spindle palm by the silky cane weevil, *Metamasius hemipterus sericeus* (Olivier).
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Figure 7. Closeup of damage to spindle palm by the silky cane weevil, *Metamasius hemipterus sericeus* (Olivier).
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Figure 8. Damage to Canary Island date palm by the silky cane weevil, *Metamasius hemipterus sericeus* (Olivier).
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Figure 9. Damage to majesty palm by the silky cane weevil, *Metamasius hemipterus sericeus* (Olivier).
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Figure 10. Damage to royal palm by the silky cane weevil, *Metamasius hemipterus sericeus* (Olivier).
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Dynamics and Trapping

Population assessment of *M. h. sericeus* is problematic. Trapping of adults is the method most often used to monitor weevil populations. Vilardebo (1973) and later Castrillon and Herrera (1980) suggested the use of a "sandwich trap" using banana pseudostem as an attractant. Using the same trapping method, Peña et al. (1995) determined that populations build up during the spring, summer and early fall in Florida, but warned that the number of weevils collected at these traps was consistently low. Perez et al. (1997) have identified major male-produced aggregation pheromones and host kairomone compounds while Giblin-Davis et al. (1996b) have optimized trap designs and protocols that can be used for enhanced monitoring of weevil populations in the field. In addition, Alpizar et al. (2002) have demonstrated that pheromone and host-baited traps can be used to mass trap *M. h. sericeus* infesting palmito palms in Costa Rica.

Management

Chemical Control

Chemically-based management tactics are currently recommended for control of *M. h. sericeus*. Giblin-Davis et al. (1996a) demonstrated that adults of *M. h. sericeus* were killed by labeled rates of acephate, carbofuran, chlorpyrifos, cyfluthrin, disulfoton, imidacloprid, isofenphos, lindane, and vydate.

Florida Landscape Plant Insect Management Suggestions

Entomopathogens

The use of entomopathogens provides a promising means of managing *M. h. sericeus*. The entomogenous fungi, *Beauveria bassiana* (Balsamo) Vuillemin and *Metarhizium anisopliae* (Metchnikoff) Sorokin, have gained considerable attention as potential control agents for weevils (Mesquita et al. 1981, Peña et al. 1995, Giblin-Davis et al. 1996a). Giblin-Davis et al. (1996a) demonstrated that the nematode *Steinernema carpocapsae* was efficacious against larvae but not the adults of *M. h. sericeus*. Researchers have concluded that because of the potential for high weevil production per Canary Island date palm in Florida and the cryptic habitat of the boring stages of this weevil, chemical insecticides and entomopathogenic nematodes would need to be applied frequently and over a long period of time for effective management of established populations.

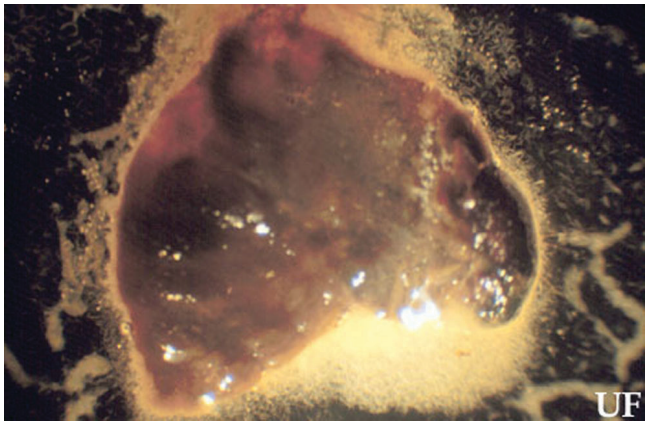

Figure 11. Nematode infested larva of the silky cane weevil, *Metamasius hemipterus sericeus* (Olivier).
Credits: Robin M. Giblin-Davis, University of Florida

Biological Control

Biological control is expected to provide additional, possibly more effective, management of *M. h. sericeus* in Florida and the Caribbean. However, very little is known about effective biocontrol agents of *M. h. sericeus* in the Americas and the Caribbean. Siqueira et al. (1996) identified predators of *Metamasius* at the family level and stated that they were more abundant in Brazil than were parasitoids. These predatory insect families included Labiduridae, Histeridae, Staphylinidae, Carabidae, Cicindelidae, Formicidae, and Reduviidae. A parasitoid was observed and identified as a tachinid.

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