

Scarlet-Bodied Wasp Moth, *Cosmosoma myrodora* (Dyar) (Insecta: Lepidoptera: Arctiidae)¹

Diego Moscoso, Rodrigo Diaz, and William A. Overholt²

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

The scarlet-bodied wasp moth, *Cosmosoma myrodora* (Dyar), is a beautiful native insect. Because of its striking adult coloration, including a bright red thorax and abdomen, and transparent wings patterned with black, this moth immediately stands out in Florida landscapes. Larval feeding is restricted to two native plants in the genus *Mikania*, family Asteraceae.

Distribution

The scarlet-bodied wasp moth is found throughout Florida, and the coastal regions of Texas, Louisiana, Mississippi, Alabama, Georgia, and South Carolina (Figure 1).

Description

Adult

Adult length is 1.52 ± 0.09 cm (mean \pm SD) (n= 5). The thorax and abdomen are bright red, and the latter has blue metallic dots on the dorsal (upper) side (Figure 2). The wings are transparent with black patterns. The ventral

(lower) side of the male's abdomen has two pouches containing fine filaments (Figure 3), called flocculence. The ventral side of the female does not have these pouches (Figure 4).



Figure 1. Distribution of the scarlet-bodied wasp moth, *Cosmosoma myrodora* (Dyar), in United States.

Credits: Diego Moscoso, University of Florida

Pupae

Pupae are 1.40 ± 0.09 cm long (mean \pm SD) (n= 5). They are protected by a 2.31 ± 0.13 cm long cocoon (mean \pm SD) (n= 5), formed by the setae (hairs) of the last instar (Figures 5 and 6). The cocoon might protect the pupa from natural enemies such as parasitoids or predators, and/or from desiccation. Early pupae are white (Figure 7). Mature pupae are red and black (Figure 8).

1. This document is EENY557, one of a series of the Entomology and Nematology Department, UF/IFAS Extension. Original publication date May 2013. Revised April 2023. Visit the EDIS website at <https://edis.ifas.ufl.edu> for the currently supported version of this publication. This document is also available on the Featured Creatures website at <http://entnemdept.ifas.ufl.edu/creatures/>.
2. Diego Moscoso, visiting scientist; Rodrigo Diaz, post-doctoral associate; and William A. Overholt, professor; Entomology and Nematology Department, UF/IFAS Indian River Research and Education Center, Fort Pierce, FL 34945.

The Institute of Food and Agricultural Sciences (IFAS) is an Equal Opportunity Institution authorized to provide research, educational information and other services only to individuals and institutions that function with non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, marital status, national origin, political opinions or affiliations. For more information on obtaining other UF/IFAS Extension publications, contact your county's UF/IFAS Extension office. U.S. Department of Agriculture, UF/IFAS Extension Service, University of Florida, IFAS, Florida A & M University Cooperative Extension Program, and Boards of County Commissioners Cooperating. Andra Johnson, dean for UF/IFAS Extension.



Figure 2. Dorsal view of the scarlet-bodied wasp moth, *Cosmosoma myrodora* (Dyar). Note blue metallic spots on the abdomen.
Credits: Rodrigo Diaz, University of Florida

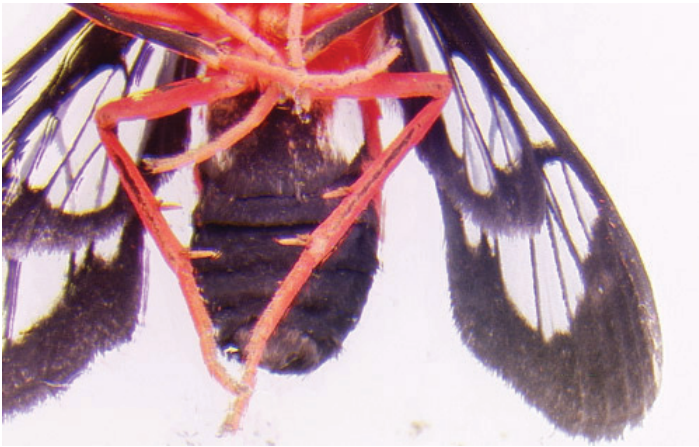


Figure 3. Ventral view of the male scarlet-bodied wasp moth, *Cosmosoma myrodora* (Dyar). Note white spots on the lateral sides of the first segment of the abdomen.
Credits: Diego Moscoso, University of Florida



Figure 4. Ventral view of the female scarlet-bodied wasp moth, *Cosmosoma myrodora* (Dyar). Note the absence of white spots on the first segment of the abdomen.
Credits: Diego Moscoso, University of Florida

Larvae

First instar larvae are 2.80 ± 0.32 mm long (mean \pm SD) ($n=5$), and they can grow up to 21.61 ± 0.78 mm long (mean \pm SD) ($n=4$) by the last instar. Larvae are covered by non-urticating (non-stinging) white setae (hairs). The color of the larvae changes from whitish in young larvae to bright yellow as the larvae ages (Figures 9, 10, and 11).



Figure 5. Scarlet-bodied wasp moth, *Cosmosoma myrodora* (Dyar), pupa inside a cocoon.
Credits: Rodrigo Diaz, University of Florida

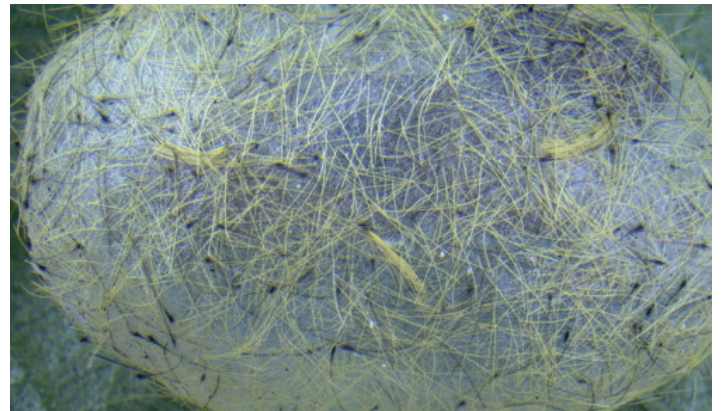


Figure 6. Scarlet-bodied wasp moth, *Cosmosoma myrodora* (Dyar), cocoon made of larva's setae.
Credits: Rodrigo Diaz, University of Florida



Figure 7. Scarlet-bodied wasp moth, *Cosmosoma myrodora* (Dyar), young pupa removed from its cocoon.
Credits: Rodrigo Diaz, University of Florida



Figure 8. Scarlet-bodied wasp moth, *Cosmosoma myrodora* (Dyar), mature pupa.

Credits: Diego Moscoso, University of Florida



Figure 11. Lateral view of a late larval instar of the scarlet-bodied wasp moth, *Cosmosoma myrodora* (Dyar).

Credits: Rodrigo Diaz, University of Florida



Figure 9. Scarlet-bodied wasp moth, *Cosmosoma myrodora* (Dyar), early-instar larva eating egg chorion.

Credits: Diego Moscoso, University of Florida



Figure 10. Dorsal view of a late larval instar of the scarlet-bodied wasp moth, *Cosmosoma myrodora* (Dyar).

Credits: Diego Moscoso, University of Florida

Eggs

The diameter of eggs is 0.88 ± 0.06 mm (mean \pm SD) ($n=5$). Eggs are white in coloration (Figure 12) and laid individually. A female can oviposit from 75 to 170 eggs during her lifetime (Castillo 2012).



Figure 12. Eggs of scarlet-bodied wasp moth, *Cosmosoma myrodora* (Dyar).

Credits: Diego Moscoso, University of Florida

Biology and Host Plants

The scarlet-bodied wasp moth completes its life cycle in 50 to 60 days. Development times for larva and pupa are 7 days and 11 days, respectively (Castillo 2012). The larvae of the scarlet-bodied wasp moth feed on the Florida Keys hempvine (*Mikania cordifolia* Willd.) (Figure 13) (Torres 1992), and the climbing hempvine/hempweed (*Mikania scandens* (L.) Willd.) (Figure 14) (Asterales: Asteraceae). Upon hatching, larvae feed on the egg chorion (Figure 9), perhaps because it is a rich source of protein. Larvae are aggressive folivores. The last instar migrates to protected areas of the plant or to the ground before it forms a cocoon.

Adult males of the scarlet-bodied wasp moth feed on dog fennel (*Eupatorium capillifolium* Lam. (Small.) (Asterales: Asteraceae)) (Figure 15) with their proboscis to obtain

defensive compounds (pyrrolizidine alkaloids) that provide protection from predators like the golden orb-web spider (*Trichonephila clavipes* L.) (Araneae, Araneidae) (Conner et al. 2000). During courtship the males passes these compounds to the female.



Figure 13. Florida Keys hempvine (*Mikania cordifolia*)
Credits: Rodrigo Diaz, University of Florida



Figure 14. Climbing hempweed (*Mikania scandens*).
Credits: Rodrigo Diaz, University of Florida

Mating Behavior

The male approaches the female, then flies around her and flutters for a while in close range. When the male is in the air, he discharges flocculence from his pouches which resembles a net that diffuses toward the female like a mist (Conner et al. 2000). After the female is surrounded by the flocculence, the male tries to copulate. The male transfers the pyrrolizidine alkaloids acquired from dog fennel to the female through seminal infusion, and the same alkaloids are then transferred to eggs by the female as a defense

against predation. If the male does not obtain the alkaloid, females and eggs are more susceptible to predation (Conner et al. 2000).



Figure 15. Dog fennel (*Eupatorium capillifolium*).
Credits: Rodrigo Diaz, University of Florida

Natural Enemies

In the spring of 2012, *Cosmosoma myrodora* larvae collected in St. Lucie County, Florida, were parasitized by *Hyphantrophaga sellersi* (Sabrosky) (Diptera: Tachinidae) (Figure 16) and an undescribed Tetrastichinae parasitoid (Hymenoptera: Eulophidae) (Figures 17 and 18).



Figure 16. *Hyphantrophaga sellersi* puparium next to pupa of the scarlet-bodied wasp moth, *Cosmosoma myrodora* (Dyar).
Credits: Rodrigo Diaz, University of Florida



Figure 17. Pupa of the scarlet-bodied wasp moth, *Cosmosoma myrodora* (Dyar), with exit hole, and remains of Tetrastichinae adults.
Credits: Rodrigo Diaz, University of Florida



Figure 18. Adult of a Tetrastichinae wasp that emerged from the pupa of the scarlet-bodied wasp moth, *Cosmosoma myrodora* (Dyar).
Credits: Rodrigo Diaz, University of Florida

Selected References

Castillo JA. 2012. Desarrollo de *Cosmosoma myrodora* y *Estigmene acrea* (Lepidoptera: Arctiidae) en la maleza *Mikania micrantha* y las plantas nativas *Mikania cordifolia* y *Mikania scandens* (Asteraceae) en Florida. (Tesis de bachiller). Zamorano University. Zamorano, Honduras. 23p.

Conner W, Boada R, Schoroeder F, Gonzalez A, Meinwald J, Eisner T. 2000. "Chemical defense: bestowal of a nuptial alkaloidal garment by a male moth on its mate." *Proceedings of the National Academy of Sciences USA* 97: 14406–14411.

Torres JA. 1992. "Lepidoptera outbreaks in response to successional changes after the passage of Hurricane Hugo in Puerto Rico." *Journal of Tropical Ecology* 8: 285–298.