

Giant Whip Scorpion *Mastigoproctus giganteus* *giganteus* (Lucas, 1835) (Arachnida: Thelyphonida (=Uropygi): Thelyphonidae) ¹

W.H. Kern Jr. and R.E. Mitchell²

Introduction

The only whip scorpion found in the United States is the giant whip scorpion, *Mastigoproctus giganteus giganteus* (Lucas). The giant whip scorpion is also known as the 'vinegaroon' or 'grampus' in some local regions where they occur. To encounter a giant whip scorpion for the first time can be an alarming experience! What seems like a

miniature monster from a horror movie is really a fairly benign creature. While called a scorpion, this arachnid has neither the venom-filled stinger found in scorpions nor the venomous bite found in some spiders.

One very distinct and curious feature of whip scorpions is its long thin caudal appendage, which is directly related to their common name "whip-scorpion." The common name 'vinegaroon' is related to their ability to give off a spray of concentrated (85%) acetic acid from the base of the whip-like tail. This produces that tell-tale vinegar-like scent. The common name 'grampus' may be related to the mantis shrimp, also called the grampus. The mantis shrimp is a marine crustacean that can deliver a painful wound with its mantis-like, raptorial front legs. Often captured with shrimp during coastal trawling, shrimpers dislike this creature because of the lightning fast slashing cut mantis shrimp can deliver to an unsuspecting finger during sorting of the shrimp from the by-catch.

Synonymy

Thelyphonus giganteus Lucas 1835

Thelyphonus excubitor Girard 1854

Thelyphonus rufus Butler 1872

Mastigoproctus giganteus giganteus Lonnberg 1879



Figure 1. The giant whip scorpion or 'vingaroon', *Mastigoproctus giganteus giganteus* (Lucas).

1. This document is EENY-493 (IN890) (originally published as DPI Entomology Circular No. 408), one of a series of Featured Creatures from the Entomology and Nematology Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Published May 2011. This document is also available on Featured Creatures website at <http://entomology.ifas.ufl.edu/creatures>. Please visit the EDIS website at <http://edis.ifas.ufl.edu>.
2. William H. Kern, Jr., associate professor, Entomology and Nematology Department, Ft. Lauderdale Research and Education Center, University of Florida, Davie, FL 33314; and R.E. Mitchell, extension director/horticulture agent, Charlotte County Cooperative Extension Service, 25550 Harbor View Road, Unit 3, Port Charlotte, FL, 33980.

Distribution

Mastigoproctus giganteus giganteus is the only whip scorpion found in the United States. This subspecies occurs in Arizona, Florida, New Mexico, Oklahoma, Texas, and in Mexico. Two other subspecies, *Mastigoproctus giganteus mexicanus* (Lucas 1835) and *Mastigoproctus giganteus scabrosus* (Lucas 1835) are confined to portions of Mexico. As a group, whip scorpions are found worldwide in the tropics and subtropics. While more commonly encountered in arid areas, *Mastigoproctus giganteus* can also be found in grassland, scrub, pine forests and barrier islands.

Description

This is a fairly large creature, up to 5 cm long, which does not include the caudal flagellum or telson. Large pedipalps (pincer-like appendages) help whip scorpions catch and kill their prey by crushing them. Mishandled, these pedipalps can give a noticeable pinch. A pair of long, thin front legs acts almost like antennae as they feel about for their prey in the dark. The whip-like telson also functions as a sensory organ. These three structures apparently help compensate for their eight weak eyes.

Table 1. Other species in the genus *Mastigoproctus* and their general distribution in the Americas.

Species Name	General Distribution
<i>M. baracoensis</i>	Cuba
<i>M. brasiliensis</i>	Brazil (Espírito Santo)
<i>M. butleri</i>	Brazil
<i>M. columbianus</i>	Colombia
<i>M. formidabilis</i>	Venezuela
<i>M. liochirus</i>	Guatemala
<i>M. maximus</i>	Brazil (Mato Grosso)
<i>M. minensis</i>	Brazil (Minas Gerais)
<i>M. nana</i>	Costa Rica
<i>M. pelegrii</i>	Cuba
<i>M. perditus</i>	Brazil (Mato Grosso)
<i>M. proscorpio</i>	Hispaniola, Martinique
<i>M. tantalus</i>	El Salvador

Table 2. Measurements of 10 representative females and one male *Mastigoproctus giganteus giganteus* (Muma 1968). The telson or caudal flagellum was extremely variable due to breakage, but some had a telson longer than the total body length.

Females (10)	Lengths in mm		
	Total	Carapace of Cephalothorax	Abdomen
Max	50.0	21.0	30.0
Min	38.0	11.0	24.0
Mean	45.3	18.5	27.9
Male (1)			
	45.0	18.0	27.0

Table 3. Measurements of 3 Riker mount specimens of *Mastigoproctus giganteus giganteus* by this author.

N= 3	Lengths in mm			
	Total	Carapace of Cephalothorax	Abdomen	Telson
Max	44.0	18.0	25.0	40.0
Min	37.0	14.0	21.0	32.0

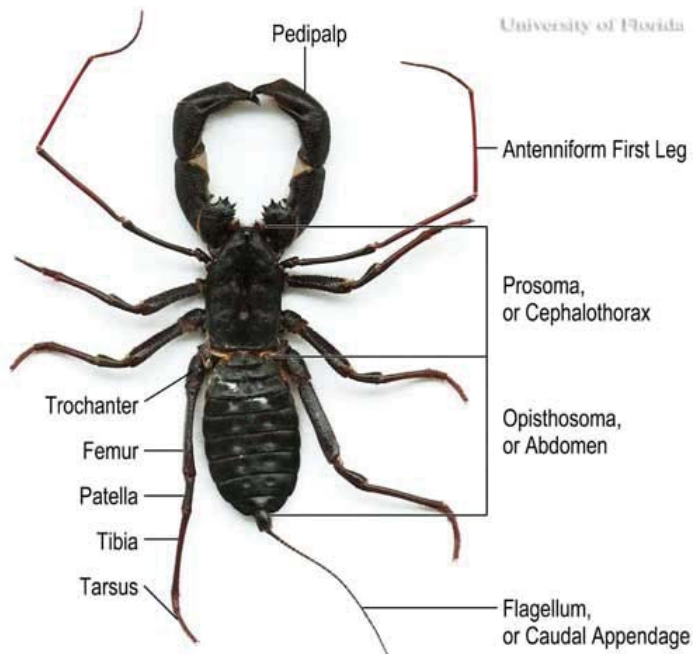


Figure 2. Dorsal view and anatomical features of the giant whip scorpion or 'vingaroo', *Mastigoproctus giganteus giganteus* (Lucas).



Figure 3. Ventral view of the giant whip scorpion or 'vingaroo', *Mastigoproctus giganteus giganteus* (Lucas).

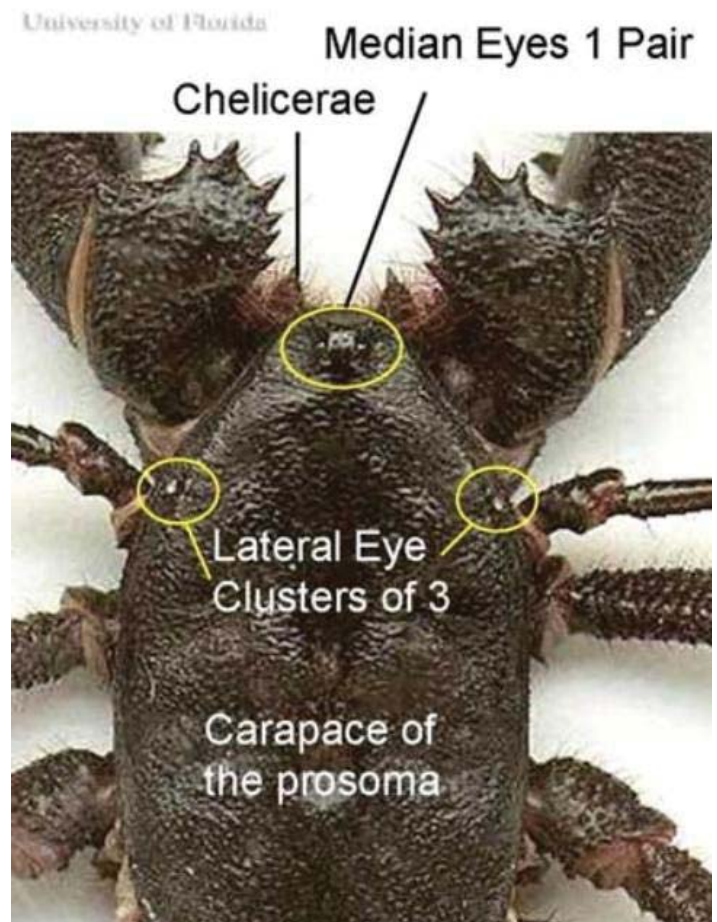


Figure 4. Close-up view of the prosoma (cephalothorax) of the giant whip scorpion or 'vingaroo', *Mastigoproctus giganteus giganteus* (Lucas).

Life History and Habitat

Whip scorpions are nocturnal predators of other arthropods. During the day they remain out of sight in burrows they dig with their pedipalps. They can often be found under logs, boards, rotting wood, rocks, and other natural dark places. Most whip scorpions occur in moist or seasonally moist forested habitats in tropical or subtropical environments. *Mastigoproctus giganteus* occur in more arid habitats with well drained soil. They spend the driest periods underground and become active on the surface during Florida's rainy season (May/June-November).

The primary prey of *Mastigoproctus giganteus* are soft bodied insects like termites, cockroaches, and crickets. One of the common prey of adults in Florida is the Florida woods roach, *Eurycotis floridensis*. Live food such as crickets and roaches are crushed between special teeth on the inside of the second segment of the pedipalps.

When threatened, vinegaroons seek the refuge of their burrows or put on a bluff display of rearing up and spreading their pedipalps. They can also accurately spray acetic

acid from a pore at the base of the caudal filament to a distance of a few inches to one foot. This defensive spray is not dangerous to skin but stings severely if it gets into an animal's eyes or nostrils.



Figure 5. The giant whip scorpion or 'vingaroon', *Mastigoproctus giganteus giganteus* (Lucas), displaying defensive stance with spread pedipalps.

Fairly long-lived, whip scorpions can live at least seven years. They grow slowly, molting three times in about three years. Once becoming adults, they live up to another four years.

Mating takes place in the fall. A complex mating ritual lasts eight to 12 hours. The male secretes and transfers a sperm sac (spermatophore) into the female. She carries the eggs internally for several months and then lays 30 to 40 eggs in a fluid filled sac held under her abdomen. She remains in her burrow holding the egg sac off the ground for an additional two months. The mucous membrane helps preserve moisture, allowing the eggs to develop. The young are white in color when they hatch from the eggs and then climb onto their mother's back for about one month. Once the first molt is complete the second instar young look like miniatures of the adults. At this point, they leave their mother's burrow. The mother whip scorpion, completing her life cycle, dies soon after. Immature *Mastigoproctus giganteus* take a year between each of the next three molts.

Natural Enemies

Mastigoproctus giganteus is large enough to be a reasonable meal for mammals like raccoons, coatis, armadillos, skunks, and even bear, feral hogs and peccaries.

Selected References

- BugGuide. (September 2009). Species *Mastigoproctus giganteus* - Giant Vinegaroon. <http://bugguide.net/node/view/29752> (21 October 2010).
- Drees BM, Jackman J. (1999). Vinegaroon. *A Field Guide to Common Texas Insects*. <http://insects.tamu.edu/fieldguide/cimg365.html> (21 October 2010).
- Fox R. (June 2006). Thelyphonus © - Whip Scorpion. *Invertebrate Anatomy OnLine*. <http://webs.lander.edu/rsfox/invertebrates/thelyphonus.html> (21 October 2010).
- Harvey MS. 2003. Catalogue of the Smaller Arachnid Orders of the World: Amblypygi, Uropygi, Schizomida, Palpigradi, Ricinulei and Solifugae. CSIRO Publishing. 400 pp.
- McMonigle O. 2008. Whipscorpions and Whipspiders: Culturing Gentle Monsters. Elytra & Antenna Publishing. 40 pp.
- Muma MH. 1967. Arthropods of Florida and Neighboring Land Areas Volume 4; Scorpions, Whip Scorpions and Wind Scorpions of Florida. Florida Department of Agriculture and Consumer Services, Division of Plant Industries, Gainesville, FL. 28 pp.