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The Florida Scorpionfly, *Panorpa floridana* Byers (Mecoptera: Panorpidae)[1]

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INTRODUCTION: The Florida scorpionfly, *Panorpa floridana* Byers, is a little-known insect, endemic to northern peninsular Florida (Byers 1993; Somma and Dunford 2008). Knowledge of this species of scorpionfly (Panorpidae) is limited to five specimens, the last one collected in 1982 (Byers 1993; Somma and Dunford 2008). The apparent scarcity of this species, lack of known or published observations on living individuals, and its superficial resemblance to stinging arthropods prompted us to prepare this circular.

IDENTIFICATION: Mecoptera is a small, ancestral order of holometabolous insects consisting of more than 605 known, extant species arranged in 34 genera and nine families worldwide (Penny 1975, 2008; Grimaldi and Engel 2005; Dunford *et al.* 2007-2008; Dunford and Somma 2008a, b). The family Panorpidae is represented by one genus, *Panorpa* Linnaeus, and more than 58 species in North America (Byers 2005; Dunford and Somma 2008a, b; Penny 2008). There are at least seven known species of *Panorpa* indigenous to the state of Florida (Somma and Dunford 2008). Panorpids can be distinguished from other mecopterans indigenous to Florida, bittacids (hangingflies) and meropeids (earwigflies), by the presence of two pretarsal claws (only one in bittacids) and ocelli (lacking in meropeids) (Byers 1993, 2005; Dunford and Somma 2008a, b). Moreover, the enlarged genital bulb of males is held curled above the dorsum of the abdomen like a scorpion's "stinger," a feature lacking in hangingflies and earwigflies (Byers 2005; Somma and Dunford 2008).

Panorpa floridana can be distinguished from other Floridian panorpids by the following combination of characters (Byers 1993): Body length 18.3-18.5 mm; color is an overall dark yellowish brown. Color of head dark yellowish brown to reddish brown, with a dark brown to black ring around each ocellus. Wings lightly tinged with yellowish brown; pterostigmal band diagonal, unbranched; humeral area of wing clear, without spots; basal band strongly constricted at vein M. Hypovalves of sternum 9 of male less than one-third length of elongate genital bulb, excluding dististyles, and borne on prolongation of sternum on ventral surface of bulb; tergum 9 narrowed toward subacute apex, lacking posterior lobes. Genital plate of female lacking posterior lobes on apical plate, axial portion thick, its apodemes only slightly divergent.

Species in Florida with somewhat superficially similar genitalia include the black scorpionfly, *Panorpa lugubris* Swederus, and the red scorpionfly, *Panorpa rufa* Gray. However, *P. lugubris* has overall black wings and a mostly black, or red and black body; while *P. rufa* has a dark band along the anterior edge of the forewing from basal band to the wing base and the pterostigmal band is usually branched, with its outer or distal branch often joining the apical band near the wing margin (Byers 1993).

DISTRIBUTION: To date, *P. floridana* is only known from specimens collected from Alachua and Clay counties in northern peninsular Florida. These are the same specimens that Byers used to describe this species in 1993. The two specimens from Alachua County, are the holotype, a male collected in Gainesville near the San Felasco Hammock in 1970 (currently housed in the Florida State Collection of Arthropods [FSCA]; Fig. 1 and 2); and a paratype, a female collected from an unspecified locality in 1974 (Byers 1993; Somma and Dunford 2008). The three specimens

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from Clay County, include: the allotype, a female collected in Gold Head Branch State Park in 1982 and a paratype, another female collected in Gold Head Branch State Park in 1982; a paratype, a male collected in Orange Park in 1936 (Byers 1993). The lattermost Clay County specimen is housed in FSCA (Somma and Dunford 2008).

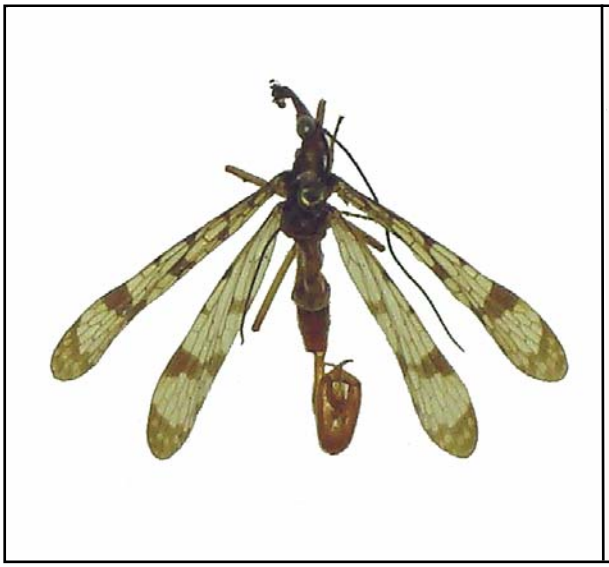

Fig. 1. Dorsal view of the holotype of the Florida scorpionfly, *Panorpa floridana* Byers, from Alachua County, Florida. Photography credit: James C. Dunford.

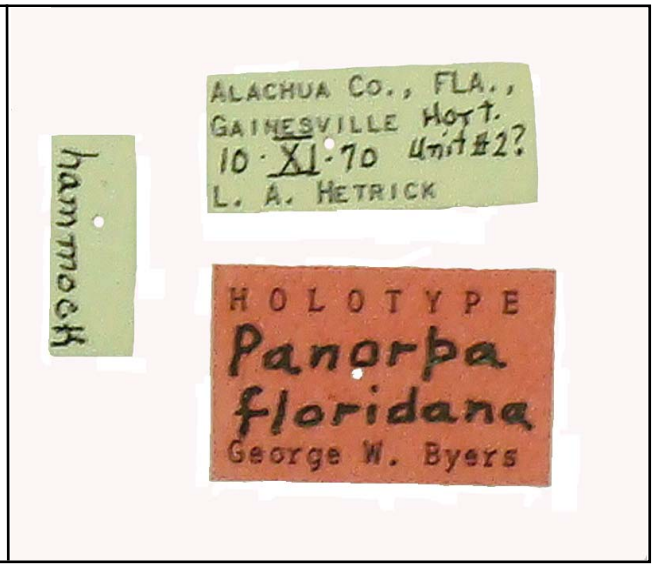

Fig. 2. Data labels of the holotype of the Florida scorpionfly, *Panorpa floridana* Byers. Photography credit: James C. Dunford.

NATURAL HISTORY AND HABITAT: Habitat information on *P. floridana* is based solely upon the meager information printed on the labels of the two Alachua Co. specimens. The holotype was collected at a horticultural unit near a primarily mesic, mixed woods hammock known as the San Felasco Hammock (Byers 1993; Somma and Dunford 2008). This site, near the intersection of Millhopper Road and NW 71st Street, still exists and is partially occupied by units from University of Florida Agricultural Experiment Stations, and the U.S. Geological Survey. The other Alachua Co. specimen was found "on saw palmetto" (Byers 1993). The two individuals collected in Gold Head Branch State Park, Clay Co., were likely collected in the deep, mossy, mesic ravine formed by Gold Head Branch, as the surrounding sandy, upland habit appears too xeric. Most panorpids tend to prefer mesic habitat with low, dense, herbaceous vegetation (Webb *et al.* 1975; Marshall 2006; Dunford *et al.* 2007-2008; Dunford and Somma 2008a, b). Four of the 5 known specimens were collected in November and the Orange Park, Clay Co., individual in late December (Byers 1993; Somma and Dunford 2008).

No living individuals of *P. floridana* have ever been observed; thus, nothing is known of their habits and life history. Other species of *Panorpa* typically eat dead and moribund soft-bodied insects, supplemented with vertebrate and snail carrion, living slugs, bird droppings, pollen, nectar and fruit juices (Byers 1963; Thornhill 1975; Webb *et al.* 1975; Byers and Thornhill 1983; Marshall 2006; Dunford and Somma 2008a, b). Many panorpid species are kleptoparasites of spider webs, feeding on the dead and trapped insects, and occasionally the resident spiders themselves (Thornhill 1975; Bockwinkel and Sauer 1993).

The reproductive habits of *P. floridana* also are unknown; however, other species of *Panorpa* are famous for ethological and sociobiological studies on their complex courtship behaviors which include various combinations of the use of pheromones, wing vibrations, stridulation, nuptial gifts of dead insects and salivary masses, and even forced copulation (Rupprect 1974; Thornhill 1980; Byers and Thornhill 1983; Thornhill and Alcock 1983). The eggs of *P. floridana* are undiscovered, but could be deposited in loose cavities in the soil as in other species of *Panorpa* (Byers 1963; Byers and Thornhill 1983; Dunford and Somma 2008a, b). Additionally, both the larval and pupal stages of *P. floridana* are unknown; however, in other scorpionfly species the larvae are soil- and litter-dwelling, eruciform, caterpillar-like scavenger-predators, and the pupae are exarate and decticous (Byers 1987, 1993; Dunford and Somma 2008a, b).

North American panorpids have no known agricultural importance. The enlarged genital bulbs of the males (and the insect's common name) may give the false impression of a venomous stinger. However, these structures are harmless to humans and instead are used for copulation, competitive grappling with other scorpionflies and fending off spiders (Thornhill 1975; Byers and Thornhill 1983; Bockwinkel and Sauer 1993).

Panorpa floridana is Florida's only described endemic mecopteran and is seemingly rare (Somma and Dunford 2008). No other individuals have been found in more than 25 years. Specimens or reports of sightings should be turned in to the Florida State Collection of Arthropods. Until more discoveries of *P. floridana* have been made, the biological and economic role of this scorpionfly in northern peninsular Florida will remain unknown.

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