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Rediscovery of the Florida Scorpionfly, *Panorpa floridana* Byers
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Abstract. We describe the rediscovery of the Florida scorpionfly, *Panorpa floridana* Byers (Mecoptera: Panorpidae), at Gold Head Branch State Park, Clay County, Florida, based upon a single, living, adult specimen photographed on 4 November 2010. The hardcopy photographic prints and electronic digital images of this panorpid are the first vouchers for *P. floridana* in 28 years, the only observation of a living specimen, and the sixth individual known of this seemingly rare Florida endemic.

Introduction

The Florida scorpionfly, *Panorpa floridana* Byers, 1993, was described 20 years ago on the basis of only five known adult specimens (Byers 1993; Somma and Dunford 2009a). This endemic Floridian panorpid has only been collected in Alachua and Clay counties, northern peninsular Florida (Byers 1993; Somma and Dunford 2008, 2009a). Known *P. floridana* specimens are a male, the holotype, collected in Gainesville at a horticultural unit near the San Felasco Hammock, Alachua County, 1970; one female paratype collected from an unspecified locality in Alachua County, 1974; a female allotype and female paratype, both collected in Gold Head Branch State Park, Clay County, 1982; and one male paratype collected in Orange Park, Clay County, 1936 (Byers 1993; Somma and Dunford 2009a). Four of the five specimens were collected in November, and the Orange Park male in December (Byers 1993; Somma and Dunford 2009a). Almost no other data help elucidate the biology of *P. floridana* except the female Alachua County specimen was found “on saw palmetto” (Byers 1993). *Panorpa floridana* currently has a NatureServe Global Conservation Status Rank of G1 (=critically imperiled because of extreme rarity, NatureServe Explorer 2012) and the Florida Natural Areas Inventory (FNAI) has State-listed it as GIS1 (= critically imperiled because of extreme rarity, Florida Natural Areas Inventory 2012). Herein we present information on the sixth known voucher and only observation of a living individual of *P. floridana*. Additionally, we provide data regarding its habitat and make suggestions for future study.

Methods and Materials

One of us (SC) surveyed the steephead ravine of Gold Head Branch, in the Mike Roess Gold Head Branch State Park, Clay County, Florida, on 4 November 2010. The camera used to photograph the



Figures 1–4. 1) Male *Panorpa floridana* in situ on low growing *Ilex* sp. in Gold Head Branch Ravine, Clay County, Florida, 4 November 2010 (photographic voucher FNAI Reference Code: N13CRE01FLUS, Reference ID: 189911; MorphoBank M152668). Photograph by Stephen Cresswell. 2) Lateral view of male *Panorpa floridana* in situ in Gold Head Branch Ravine, Clay County, Florida, 4 November 2010 (photographic voucher FNAI Reference Code: N13CRE01FLUS, Reference ID: 189911; MorphoBank M152669). Photograph by Stephen Cresswell. 3) Dorsal view of male *Panorpa floridana* in situ in Gold Head Branch Ravine, Clay County, Florida, 4 November 2010 (photographic voucher FNAI Reference Code: N13CRE01FLUS, Reference ID: 189911; MorphoBank M152670). Photograph by Stephen Cresswell. 4) Anterior view of head of male *Panorpa floridana* in situ in Gold Head Branch Ravine, Clay County, Florida, 4 November 2010 (photographic voucher FNAI Reference Code: N13CRE01FLUS, Reference ID: 189911; MorphoBank M152671). Photograph by Stephen Cresswell.

scorpionfly was a Cannon 5D Mark II with a 180 mm macro lens and MT-24 macro twin flash; exposure 1/200 s at f18 and f16. Two of these images were originally posted on BugGuide (Cresswell 2011), where these initial online postings were used to make a species determination by Wesley J. Bicha (in Cresswell 2011, pers. comm. 2012). These and one other photographic image were used by two of us (LAS, JCD) to verify the species identity based upon visible morphology, especially the forewings, by comparing with published descriptions (Byers 1993; Somma and Dunford 2009a) and the two specimens (the holotype and the Orange Park paratype) maintained in the Mecoptera Collection of the Florida State Collection of Arthropods (FSCA), Division of Plant Industry (DPI), Florida Department of Agriculture and Consumer Services (FDACS) (Dunford and Somma 2008, 2009a; Dunford et al. 2013). These three images, along with a fourth photograph better illustrating the plant on which the panorpids was found (Fig. 1–4), were made into duplicate hardcopy photographic prints and vouchered in the McGuire Center for Lepidoptera



Figure 5. Flowing water of Gold Head Branch, 2–3 m from the vouchered *P. floridana*, Clay County, Florida, 4 November 2010. Photograph by Stephen Cresswell.

a characteristic of the *Panorpa lugubris* Swederus, 1787, species group, detailed features of the genitalia which distinguish it from other species in this group (Byers 1993) are not visible. However, the unique forewing morphology (Fig. 2–3) which separates it from all other Florida panorpid include lightly tinted yellowish brown membranes, a diagonal unbranched pterostigmal band, and a basal band strongly constricted at vein M (Byers 1993; Somma and Dunford 2009a). Although the humeral area of the forewings of *P. floridana* are immaculate (Byers 1993), herein we note that the subcostal veins are blackened or edged in black along the basal third of their length in this specimen (Fig. 2–3), and both the holotype and paratype housed in FSCA. The overall color of the body is yellowish to yellowish brown, the head is reddish, and the ocelli are encircled by dark blackish rings (Fig. 2–4), further verifying that this individual is *P. floridana*, the Florida scorpionfly (Byers 1993; Somma and Dunford 2009a). This living *P. floridana* has black antennae, mostly black tarsi, and reddish abdominal segments 6–9 (Fig. 2–4); characteristics which are less clear in pinned, darkened specimens.

Gold Head Branch forms a steephead, or sapping valley, created by the outflow of clear-water springs within Gold Head Branch State Park, located approximately 7.4 km northeast of Keystone Heights and 37 km east-northeast of Gainesville in northern peninsular Florida (Rosenau et al. 1978; Scott et al. 2004; Hermansen 2009). This fire-protected steephead ravine is approximately 14 m deep and cuts through principally flat, upland xeric high pine and scrub ecosystems within the park; but the habitat within the ravine proper is lush, humid, dominated by a southern hardwood ecosystem, has greater thermal stability than the surrounding uplands, and is known for its remarkable diversity of flora and salamanders (Watts and Stuiver 1980; Platt and Schwartz 1990; Hermansen 2009). These features are shared by other steepheads located westward in the Florida Panhandle (Neill 1957; Means 1981, 2000; Dunford et al. 2007). The physical environment and formation of this ravine may be related to geomorphological features of the southernmost extent of the Trail Ridge and northernmost expression of the Lakes Wales Ridge dur-

and Biodiversity (MGCL), Florida Museum of Natural History, University of Florida; the Howard V. Weems, Jr., Reprint Collection in FSCA; and FNAI (Reference Code: N13CRE01FLUS, Reference ID: 189911). Additionally, the electronic versions of the digital images were vouchered with FNAI (Reference Code: N13CRE01FLUS, Reference ID: 189911) and MorphoBank (project number p879; www.morphobank.org/permalink/?P879) under the codes: M152668-M152671). The MorphoBank vouchers are open access.

The length of the scorpionfly was measured to the nearest 0.1 mm by SC photographing a plastic metric ruler immediately after the initial images were taken, at the same distance from the lens, using the identical camera settings, afterwards comparing this photograph against the photograph illustrating the insect's lateral aspect (Fig. 2).

Results and Discussion

The scorpionfly was observed and photographed in situ on a low growing, undetermined species of holly, *Ilex* sp. (Fig. 1–4) under conditions of low ambient lighting between 1214–1217 h. This specimen was on the Fern Loop Trail approximately 15 m from the bottom of the ravine stairway (29.8409°N, 81.9544°W), 2–3 m from the flowing water of Gold Head Branch (Fig. 5). The panorpid was a male 15.1 mm long from apex of anteriormost ocellus to forewing apex. Although an elongate genital bulb is barely visible through the folded wings (Fig. 2),

ing various Pleistocene marine depositions and resortings (Hermansen 2009). Steephead ravines in other parts of northern Florida have proven productive for a variety of unique biota including another elusive mecopteran, the North American earwigfly, *Merope tuber* Newman, 1838 (Dunford et al. 2007; Somma 2011).

Somma and Dunford (2009a, variously reprinted as Somma and Dunford 2012a, 2012b, 2012c) predicted *P. floridana* would be rediscovered in the moist, shaded steephead ravine rather than the surrounding xeric ecosystems in this park; thus, conforming to habitats preferred by most species of Mecoptera (Byers and Thornhill 1983; Dunford and Somma 2008). Other members of the *lugubris* species group are unusual in their preference to open, more xeric environments (Byers 1963, 1993; Evans and Flint 2009; Somma 2011).

No detailed habitat information exists for the other five specimens of *P. floridana* previously collected in Alachua and Clay counties. However, we suggest searching spring seepages, including wet or inundated sinkholes roughly approximating a steephead environment such as Devil's Millhopper in Alachua County (Arnold 1936), during the months of November and December, in these and other nearby counties in northern peninsular Florida. Shady, lush microhabitats with low growing, leafy vegetation may prove particularly productive. To date there is not enough knowledge covering the biology and abundance of *P. floridana* to adequately determine the status of this Florida endemic. In many respects, this is in keeping with the overall knowledge of the Mecoptera of Florida, which remain poorly collected and severely understudied (Somma and Dunford 2008, 2009b; Somma 2010, 2011). Clearly, new discoveries in mecopteran biology await young naturalists and intrepid students of the Florida biota.

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