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First U.S. records of *Amorbia concavana* (Zeller) (Lepidoptera: Tortricidae)

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(Lepidoptera: Tortricidae)

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**First U.S. records of *Amorbia concavana* (Zeller)
(Lepidoptera: Tortricidae)**

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Abstract. *Amorbia concavana* (Zeller) (Lepidoptera: Tortricidae) is reported in Florida, USA. Male and female specimens are figured, and new host records are given. The species is compared to other Nearctic species of *Amorbia* Clemens. Florida specimens are more similar to Cuban than to Central American material with respect to male genitalia.

Introduction

Amorbia Clemens (Tortricidae: Sparganothini) includes 29 species distributed in the New World (Phillips-Rodríguez and Powell 2007), of which Powell and Brown (2012) report two in Florida, USA. A third, *Amorbia concavana* (Zeller), is also established in southern Florida. I identified the species and solicited confirmation too late for inclusion in the Moths of North America fascicle on Sparganothini (Powell and Brown 2012), so I intend this note to supplement that treatment.

The earliest known records are four males caught by Jim Vargo on 23 February 2004, two miles east of Florida City (Miami-Dade County), and a fifth on 6 March 2005 (J. Vargo, pers. comm. 2012). From April 2006 through early 2008, large numbers of males were caught in traps baited with a pheromone for *Spodoptera litura* (F.) (Lepidoptera: Noctuidae) as part of the Cooperative Agricultural Pest Survey (CAPS) *Spodoptera* program and submitted for identification to the Florida Department of Agriculture and Consumer Services, Division of Plant Industry (FDACS-DPI). A few female specimens were subsequently obtained by rearing and submitted to DPI. The species has been photographed in the wild and posted on the Moth Photographers Group website (Patterson 2012).

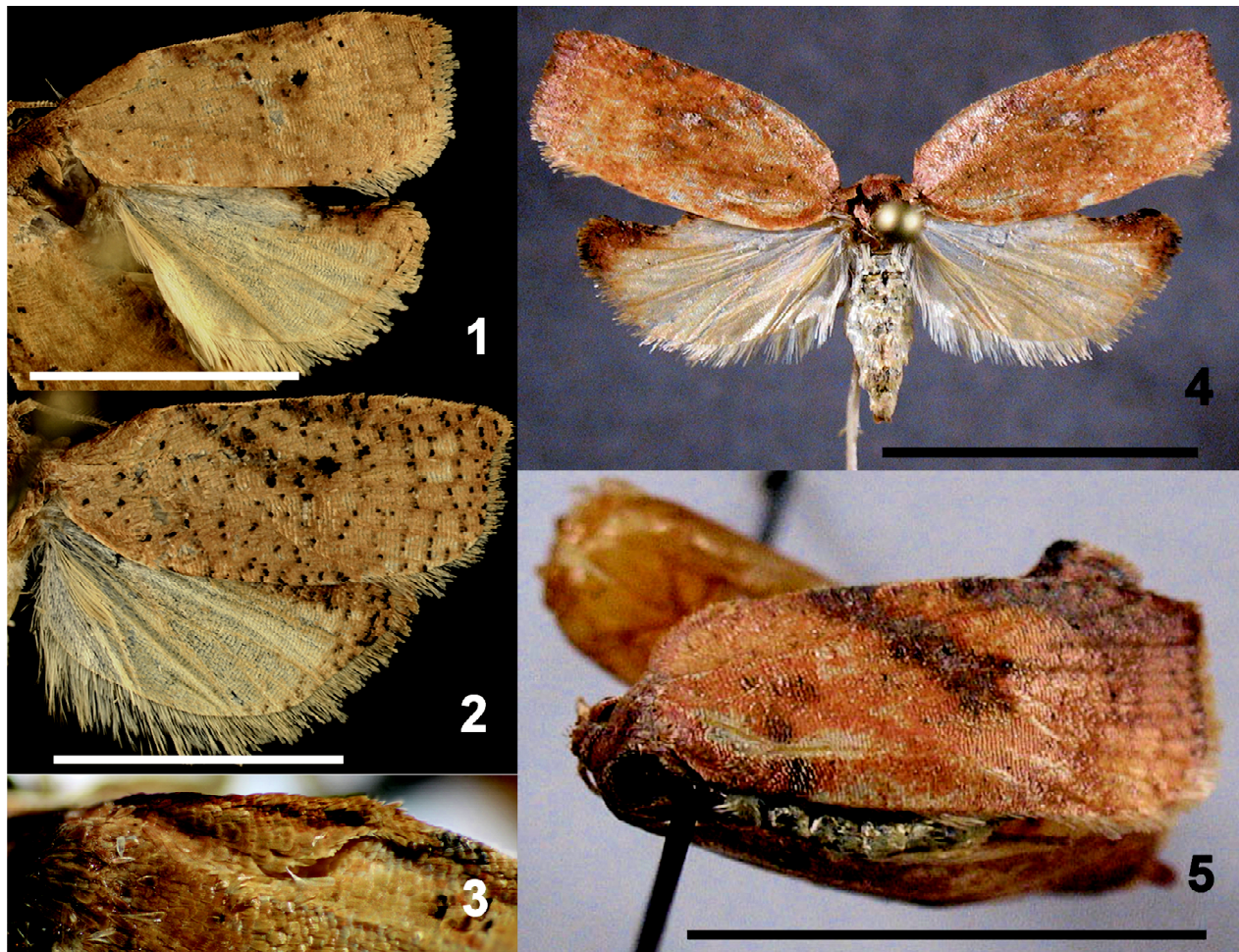
Materials

Dissections were made according to Robinson (1976). Initial identification was based on information in Phillips-Rodríguez and Powell (2007) and confirmed by J. Powell (pers. comm., Essig Museum of Entomology, Berkeley, CA) and J. Brown (pers. comm., USDA-ARS). Photographs were taken with an Auto-montage Pro 5.01 (Syncroscopy; Synoptics Ltd.) using a JVC digital camera and Leica Z16APO lens at FDACS-DPI. Specimens are deposited in the Florida State Collection of Arthropods (FSCA, Gainesville, Florida, USA) and the National Museum of Natural History (NMNH, Washington, D.C.). Unless a depository is listed below, records of specimens that were returned to collectors, discarded, or lost, mostly from 2008, were obtained from the FDACS-DPI regulatory database.

***Amorbia concavana* (Zeller, 1877)**

(Fig. 1–7)

Material examined. USA, Florida: 5MM: “FLORIDA: Dade Co. Miami-Cutler 10 Apr 2006 E. M. Varona 06-1864 *Spodoptera litura* pheromone trap in *Trema micranthum* tree” (NMNH, FSCA); 3MM: “FLORIDA: Dade Co. Homestead (CAPS survey) 16 May 2008 M. Meadows *Spodoptera litura* lure trap” (NMNH, FSCA); 1M: “FLORIDA: Dade Co. Homestead (CAPS survey) 21 Nov 2007 07-8993 N. Rodriguez *Spodoptera litura* lure trap”; 1M: same except “3 Dec 2007 07-9010”; 1M: same except “3 Dec 2007 07-9020”; 1M, 1F: “FL: Miami-Dade Co. Homestead Tres Amigos Nursery, Redland Dr. & SW 280th St. 21-X-2011 On *Mikania micrantha* leaves. R. Diaz. E2011-8947”, male except “JEH slide 1475” (NMNH); 1M: “FLORIDA: Dade Co. Homestead (CAPS survey) 29 Oct 2007 07-8111 C. Carter *Spodoptera litura* lure



Figures 1–7. *Amorbia concavana* specimens from Florida. **1)** Male, right wings (Homestead, FL, 3 Dec. 2007, FSCA; scale = 5 mm). **2)** Male, right wings (Homestead, FL, 28 Nov. 2007, FSCA; scale = 5 mm). **3)** Male costal fold. **4)** Female habitus (Homestead, FL, 11 Jan. 2012, FSCA; scale = 1 cm). **5)** Unspread female (Homestead, FL, 21 Oct. 2011, FSCA; scale = 1 cm).

trap”; 1M: same except “28 Oct 2007 07-8973” “FLMNH-MGCL Slide 00479”; 1M: “FLORIDA: Dade Co. Homestead (CAPS survey) 26 Nov 2007 07-8988 M. Meadows Spodoptera litura lure trap”; 2MM: same except “07-8994” and “07-9004”, “FLMNH-MGCL Slide 00480”; 2MM: same except “27 Nov 2007 07-8995” and “27 Nov 2007 07-8999”; 4MM: “FLORIDA: Dade Co. Homestead (CAPS survey) 20 Nov 2007 07-9000 N. Rodriguez Spodoptera litura lure trap”; 9MM: same except “07-9001”, “29 Nov 2007 07-9006”, “3 Dec 2007 07-9009”, “3 Dec 2007 07-9011”, “3 Dec 2007 07-9012”, “27 Nov 2007 07-9005 Begley”, or “3 Dec 2007 07-9016 D. Begley”; 2FF: “FL: Miami-Dade Co. Homestead. Tree Amigos Nursery, Redland Dr. & SW 280th St. 21-X-2011 On *Mikania micrantha* leaves. R. Diaz. E2011-8947”, [one] “FLMNH-MGCL Slide 00354”; 1F: “FL: Miami-Dade Co. Homestead, 27620 SW 187 Ave, Tree Amigos Nursery. 11-I-2012 on *Mikania micrantha* (#115). R. Diaz & J. McClury. E2012-876”; 1F: “FLORIDA, Dade County Homestead ex *Rosa* Ref # 10-08 15-IV-2008 R. Duncan”; 1M: “FLORIDA: Dade Co. Homestead (CAPS survey) 28 Nov 2007 07-9019 D. Bagley Spodoptera litura lure trap”; 1M: “FLORIDA: Dade Co. Homestead. TREC 18 Apr 2008 08-2256 M. Meadows”; 1M: “FL: Broward Co. Dania Beach, John Lloyd SP, 6503 N Ocean Dr. UV. 21-VI-2012 CAPS IMS M. DaCosta, J. Garcia E12-5008” (FSCA).

Diagnosis. Males of *A. concavana* can be distinguished from Nearctic congeners by the presence of a costal fold (Fig. 3) and cornuti that are perpendicular to the longitudinal axis of the phallus (Fig. 6). The females key out to *Amorbia* Clemens in Powell and Brown (2012: 27), but most males run to *Coelostathma*

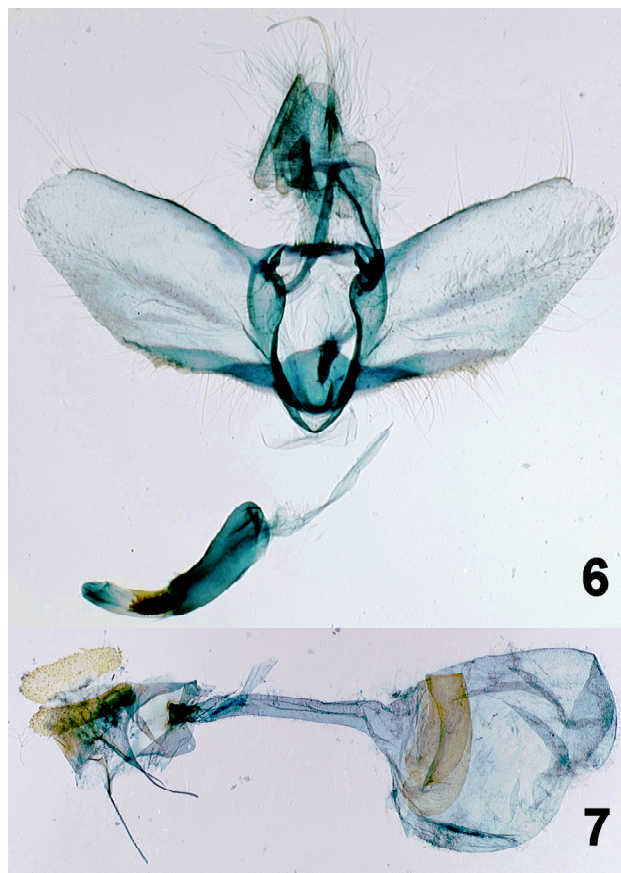
Clemens because of their small size. They differ from *Coelostathma* in lacking ocelli, having a costal fold, and having the sacculus with small ventral projections rather than elongate subbasal or distal processes. Among *Amorbia* species, both sexes key out to *A. emigratella* Busck or *A. vero* Powell and J. Brown (Powell and Brown 2012: 29). Those species differ in lacking a distinct saccular process, and *A. vero* has less strongly colored scales on the apex of the hind wing and a slightly narrower signum than other congeners. Besides *A. concavana*, only *A. vero* and *A. humerosana* Clemens are currently recorded in Florida (Powell and Brown 2012); the latter species is easily distinguished by its gray color and large size (forewing length 10–16 mm).

Descriptive notes. Males have beige forewings with scattered black and silver scales (Fig. 1–2). The hind wings are pale yellow-beige without a transparent area, and the apex is distinctly dark orange with black scales. Females are similar but have darker, rather orange forewings with less black scaling (Fig. 4–5). The quantity of black scales on the male forewing is variable among Florida specimens, but they are otherwise quite homogeneous. The male forewing length is 6.0–8.0 mm (mean = 7.1 mm, $n = 27$), and the female forewing length is 10.0–12.0 mm (mean = 11.0 mm, $n = 4$). The venation is as in other *Amorbia* species, with sexually dimorphic forewing radial veins. The male genitalia (Fig. 6; $n = 3$) have one short saccular spine that is consistent in length among examined material. The corpus bursae has a broad, band-shaped signum typical of *Amorbia* (Fig. 7).

Remarks. The male genitalia differ somewhat from those of Central American populations, represented by a Honduran specimen in Fig. 84 of Phillips-Rodríguez and Powell (2007). Those have a distinctly emarginate sacculus and a longer saccular process, whereas Floridian specimens have a nearly straight sacculus and short spine. However, they are more similar to the illustration of *A. phaseolana* Busck in Busck ([1934]: pl. 30 fig. 4), a Cuban species synonymized with *A. concavana* by Phillips-Rodríguez and Powell (2007). Lambert (1950) also illustrated a short saccular spine in *A. concavana*, but he did not state the dissection's provenance. The Cuban population may prove to be a distinct species from the Central American one, with the Floridian population conspecific with the former, but a decision on the status of *A. phaseolana* will depend on examination or sequencing of Cuban specimens.

The female was not available to Phillips-Rodríguez and Powell (2007), but Busck ([1934]: pl. 36 fig. 8) illustrated the female of *A. phaseolana* and noted that it was much larger than the male. Photographs of both sexes and larvae are available online in Janzen and Hallwachs (2012).

Phillips-Rodríguez and Powell (2007) suggested that *Amorbia effoetana* (Möschler), described from one female specimen from Puerto Rico, could be conspecific. The type specimen was not examined by Lambert (1950) nor by Phillips-Rodríguez and Powell (2007), and it is still absent from the Museum für Naturkunde (W. Mey, pers. comm. 2012). Although nomenclaturally unavailable, Lambert (1950) synonymized *A. phaseolana* with *A. effoetana* and illustrated male genitalia very similar to Fig. 6; it is unknown whether his figure represents Cuban or Puerto Rican populations. Möschler described the species as having “graubraun” (brownish gray) hind wings, so it may well be specifically distinct.



Figures 6–7. *Amorbia concavana* specimens from Florida. **6)** Male genitalia (same data, JEH slide 1475, NMNH). **7)** Female genitalia (same data, JEH slide 1473, FSCA).

Hosts. *Amorbia concavana* is polyphagous (Busck [1934]; Phillips-Rodríguez and Powell, 2007; Janzen and Hallwachs 2012) with some preference for Fabaceae. The records on *Rosa* L. sp. (Rosaceae) and *Mikania micrantha* Kunth (Asteraceae) are novel. The latter is a fast-growing weed that is invasive in Florida (Anderson et al. 2012).

Distribution. *Amorbia concavana* is distributed from northern Mexico (Tamaulipas) to Panama and also in Cuba (Phillips-Rodríguez and Powell 2007). Most of the Florida records are from Miami-Dade County around Homestead and Miami, but one specimen is known from Dania Beach, Broward County. Photograph vouchers posted on the Moth Photographers' Group (Patterson 2012) include specimens from near Florida City, February 2004 (J. Vargo); Davie, May 2006 (P. Ayick); and Anhinga Trail, in Everglades National Park near the main entrance, February 2012 (C. Wolf).

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