



Two new species of Eucosmini from the Bahamas (Lepidoptera: Tortricidae)

TODD M. GILLIGAN¹, DEBORAH L. MATTHEWS^{2,3} & JACQUELINE Y. MILLER^{2,4}

¹Identification Technology Program, USDA-APHIS-PPQ-S&T, 2301 Research Blvd., Suite 108, Fort Collins, Colorado 80526, USA.
E-mail: todd.m.gilligan@aphis.usda.gov

²McGuire Center for Lepidoptera & Biodiversity, Florida Museum of Natural History, 3215 Hull Road, Gainesville, FL 32611, USA.

³E-mail: dlott@flmnh.ufl.edu, ⁴E-mail: jmiller@flmnh.ufl.edu

Recent surveys to document the poorly known moth fauna of the Bahamas have resulted in the collection of more than 60 morphospecies of Tortricidae. Among these are several Eucosmini, including undescribed representatives of *Eucosma* and *Pelochrista* that are similar to several species present in the southeastern United States. *Eucosma bahamae*, **sp.n.**, a member of the *E. refusana* group, and *Pelochrista wrighti*, **sp.n.**, a member of the *P. canana* group, are described and illustrated.

Key words: *Eucosma bahamae*, *Pelochrista wrighti*

Introduction

The Bahamas is an archipelago consisting of more than 700 islands that extend from Grand Bahama in the North to the Inagua Islands in the South. Although the Bahamas has been extensively surveyed for butterflies (Smith et al. 1994), the moth fauna is poorly known, with only scattered records in taxon-specific treatments and a two-part checklist by Hampson (1901, 1904) that includes primarily macrolepidoptera. In 2010, the third author along with field associates began a more comprehensive inventory of the Bahamas, surveying for all Lepidoptera. In 2014, subsequent to a season of substantial rainfall throughout the islands, 11 major islands were sampled for up to five days each with a different location or habitat sampled each night. Additional islands or localities were surveyed again in 2015 and 2016.

Since 2010, a total of 774 specimens of Tortricidae have been processed from Bahamas survey material, representing more than 60 distinct morphospecies. Among these are several Eucosmini, including species of *Eucosma* Hübner and *Pelochrista* Lederer. One such species was identified as *Eucosma grindeliana* (Busck), previously recorded from throughout the southern U.S., and two others are described below as new. The latter two taxa show close affinities to groups of species with members present in the southeastern U.S. (*E. refusana* and *P. canana* groups; Wright and Gilligan 2015, 2017) but differ consistently in wing pattern from currently named species. *Eucosma* and *Pelochrista* species are relatively scarce in the extreme southeastern U.S. Of the 301 Nearctic species treated by Wright and Gilligan (2015, 2017), less than 20 have been recorded from Florida. The discovery of these new taxa suggests that other undiscovered *Eucosma* or *Pelochrista* may be present in the Caribbean outside of the documented range for these genera.

Materials and methods

A total of six male specimens were examined for this study, all of which are deposited in the McGuire Center for Lepidoptera, Florida Museum of Natural History, Gainesville, Florida, USA (MGCL). Images of adults were taken with Canon 100 mm and MP-E 65 mm macro lenses attached to a Canon 5DS digital SLR (Canon U.S.A., Inc., Melville, NY). Images of genitalia were taken with a Nikon DS-Fi1 digital microscope camera attached to a Nikon Labophot-2 compound microscope (Nikon Instruments, Inc., Melville, NY). All images were edited using Photoshop CS6 Extended (Adobe Systems, Inc., San Jose, CA). Forewing length (FWL) is defined as the distance from the base to the apex including the fringe, reported to the nearest one-tenth of a millimeter. Measurements were made with the “Analysis” tool in Photoshop using known measurement scales. Abbreviations are as follows: AR = forewing aspect ratio, forewing length divided by medial forewing width; n = the number of observations supporting a particular statistic; NR = neck ratio, neck width divided by basal valva width; SA = saccular angle, the angle formed at the distal end of the sacculus by linear approximations to the ventral margins of the sacculus and the base of the neck. Dissection methods follow those

presented in Brown and Powell (1991), and morphological nomenclature follows Gilligan et al. (2008), Wright and Brown (2014), and Wright and Gilligan (2015, 2017).

Results and discussion

Eucosma bahamae Gilligan and Matthews, sp.n. (Figs. 1–3, 7)

Diagnosis. Although the female is unknown, *E. bahamae* is confidently placed in *Eucosma* in the *refusana* group (Wright and Brown 2014; species 16–24 in Wright and Gilligan 2015), based on similarity of male genitalia and forewing markings. It can be separated from other members of the group by its forewing pattern: uniform pale yellow with mottled grayish-brown to orange-brown markings, variably expressed lustrous gray striae, and a large salt-and-pepper-colored ocelloid region surrounding the ocellus. In other members of the group with a similar ocelloid region the forewing is visibly divided into proximal (basal two-thirds) and distal sections.

Description. Male (Figs. 1–3, 7). *Head*: Frons brown to straw yellow; vertex brown to straw yellow with many scales brown apically; labial palpus length subequal to diameter of compound eye, first two segments orange brown to dark brown dorsally, straw yellow ventrally, third segment solid orange brown to dark brown; antenna orange brown to dark brown; scape brown to dark brown. *Thorax*: Dorsal surface and tegula pale brown with scales dark-tipped to uniform straw yellow; pro- and mesothoracic legs mottled brown to orange brown, metathoracic leg pale yellow to white, tarsi with brown annulations. Forewing (Figs. 1–3) length 4.9–5.8 mm (mean 5.4 mm; $n = 3$), AR = 2.86; costal fold absent; ground color pale yellow; wing markings grayish brown to orange brown, scales often with dark apices; costal strigulae weakly expressed in distal one third of wing, obscured into a continuous narrow dark band along the costa in the proximal two thirds; basal, subbasal, and median fasciae weakly to moderately expressed as indistinct mottling; striae lustrous gray to silver, variably expressed in distal one third of wing, stria number 6 extending nearly continuously from costa along proximal margin of ocelloid region to dorsum; ocelloid region extending from tornus to radius, ringed with lustrous gray and fragments of striae; scales in ocelloid region and along termen white basally, dark brown medially, and white apically, producing a salt-and-pepper effect; ocellus with three rows of four black dashes on a white background separated medially by a lustrous gray vertical bar. Hindwing white to pale brown with pale grayish brown scales tracing veins; elongate fringe scales white, subtended by a layer of shorter, grayish scales. *Abdomen*: Genitalia ($n = 2$) (Fig. 7) with uncus with basal width ca. $2 \times$ height, well-differentiated from dorsolateral shoulders of tegumen; socii fingerlike; phallus stout, tapering distally; vesica with 7–12 deciduous cornuti; valva with costal margin nearly straight, basal setal patch weakly raised, densely covered with stiff moderately long setae, ventral emargination shallow, NR = 0.74, saccular corner broadly rounded, mean SA = 148° ; cucullus with dorsal lobe moderately developed, apex rounded, distal margin weakly convex, anal angle weakly produced, basoventral margin extending in ridgelike manner onto medial surface of neck, basal excavation shallow.

Female. Unknown.

Holotype (Fig. 1). ♂, “BAHAMAS: Crooked Is[land], Pittstown Point, 22.831211°, -74.348717°, 10–11.iii.2014, at light, M. Simon & M. Simon. Bahamas Survey, MGCL Accession No. 2014-8. TMG 728 Genitalia dissection. MGCL 233071 McGuire Center for Lepidoptera & Biodiversity, FLMNH, UF [barcode]” MGCL.

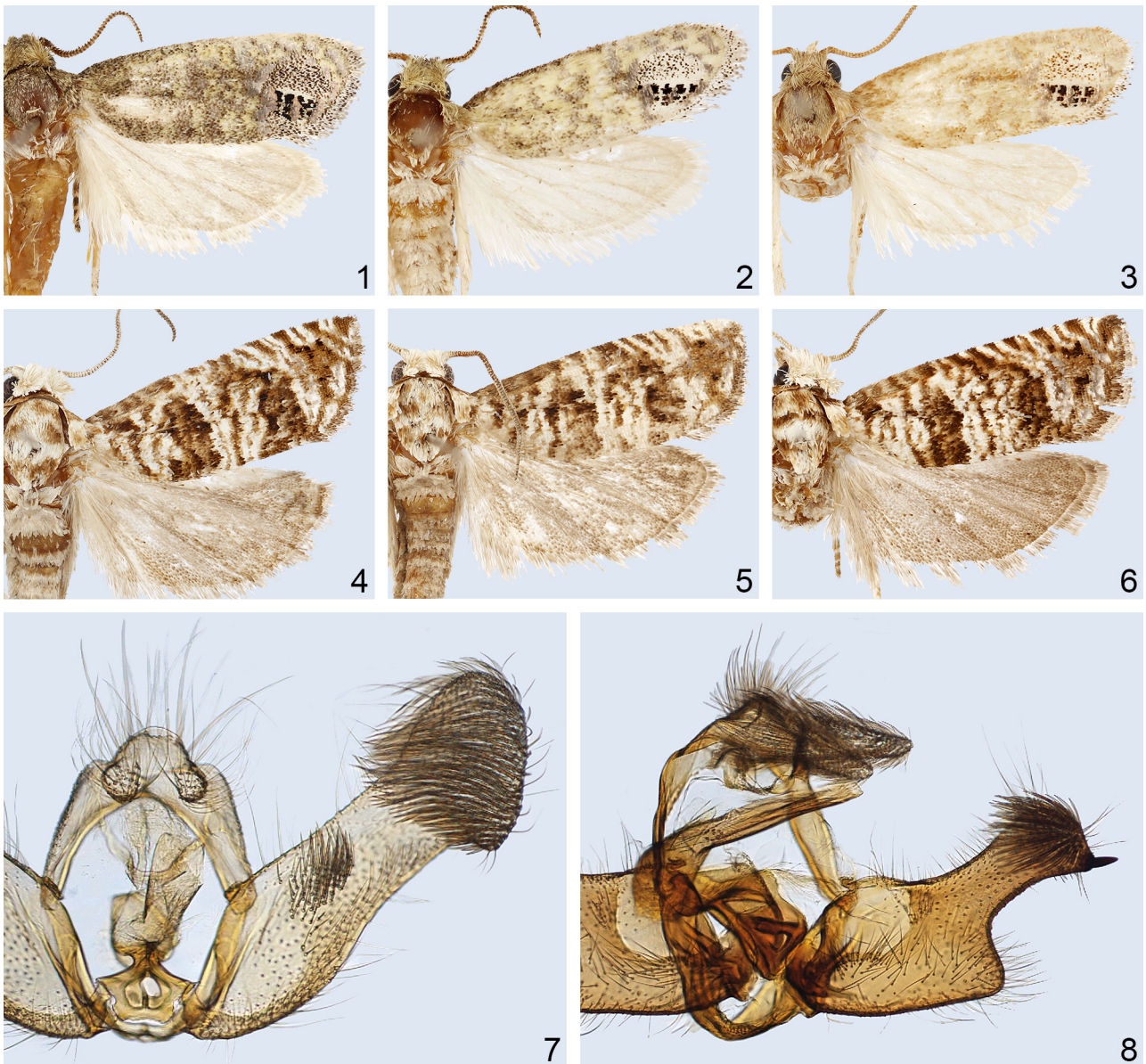
Paratypes (Figs. 2–3). BAHAMAS: Long Island, vic. Salt Pond, 23.353833°, -75.119500°, 30.v.2014, J. Miller, G. Goss, M. Simon, D. Matthews. Bahamas Survey MGCL Accession No. 2014-14. MGCL 234324 McGuire Center for Lepidoptera & Biodiversity, FLMNH, UF (1 ♂ MGCL); Cat Island, vic. Ocean Dream Resort, E of Smith Town, 24.352295°, -75.454510°, 23.vi.2014, J. Miller, M. Simon, D. Matthews, G. Goss. Bahamas Survey MGCL Accession No. 2014-15. D. Matthews Genitalia Prep. # 1826. MGCL 238600 McGuire Center for Lepidoptera & Biodiversity, FLMNH, UF (1 ♂ MGCL).

Etymology. The species name refers to the Bahamas, the only location from which this species has been collected.

Distribution and Biology. This species has been recorded only from islands in the Bahamas. Adults were captured in March–June. Larval hosts are unknown. Specimens were collected in open disturbed areas less than 0.1 mile from the shoreline with dune vegetation present.

Pelochrista wrighti Gilligan and Matthews, sp.n. (Figs. 4–6, 8)

Diagnosis. The distinctive male genitalia place *P. wrighti* in *Pelochrista* in the *canana* group (species 78–87 in Wright and Gilligan 2015). *Pelochrista wrighti* can be separated from all other members of the group by the lack of a well-defined ocellus and the white and brown fasciate pattern on the forewing.



FIGURES 1–8. Wing patterns and genitalia. **1.** *Eucosma bahamae* (male, holotype). **2–3.** *E. bahamae* (male, paratype). **4.** *Pelochrista wrighti* (male, holotype). **5–6.** *P. wrighti* (male, paratype). **7.** *E. bahamae* (male genitalia, holotype). **8.** *P. wrighti* (male genitalia, holotype).

Description. Male (Figs. 4–6, 8). *Head:* Frons white; vertex white with mix of brown scales laterally; labial palpus length ca. $1.25 \times$ horizontal diameter of compound eye, first two segments light pale brown dorsolaterally, white ventrally, third segment solid brown; antenna light pale brown; scape white. *Thorax:* Dorsal surface and tegula white with mottled patches of brown and light brown; pro- and mesothoracic legs brown, metathoracic leg pale brown to white, tarsi with white annulations. Forewing (Figs. 4–6) length 6.5–7.6 mm (mean 7.1 mm; $n = 3$), $AR = 2.74$; costal fold present along basal 1/3 of costa; ground color brown; wing markings white and brown; costal strigulae strongly expressed distad of costal fold (pairs 3–9); subbasal fascia dark brown, continuous from dorsum to radius; striae associated with costal strigulae pairs 5–6 dislocated distally and confluent with stria 7, separating the median and postmedian fasciae into narrow bands and a conspicuous dark brown pretornal patch; postmedian band and preterminal fascia indistinct patches or bands; ocellus absent. Hindwing brown, fringe scales brown basally, pale grayish brown apically. *Abdomen:* Genitalia ($n = 2$) (Fig. 8) with uncus evenly rounded, densely setose, weakly differentiated from dorsolateral shoulders of tegumen; socii long, densely setose, narrowed distally; phallus relatively long, tapering gradually, with base loosely surrounded by anellus; vesica with 9–10 deciduous cornuti; valva with costal margin weakly concave to nearly straight, ventral emargination moderate, $NR = 0.35$, saccular corner acute, mean $SA = 76^\circ$; valval neck

with subcostal line of hairlike setae; cucullus with dorsal lobe weakly developed and rounded, ventral lobe triangular, anal spine stout, medial surface covered in coarse setae.

Female. Unknown.

Holotype (Fig. 4). ♂, “BAHAMAS: South Abaco, Schooner Bay Institute, vic. power substation, 26.167500°, -77.18900°, 4.vi.2016, J. Miller, G. Goss, M. Simon, D. Matthews. Bahamas Survey, MGCL Accession # 2016-09. TMG 729 Genitalia dissection. MGCL 246573 McGuire Center for Lepidoptera & Biodiversity, FLMNH, UF [barcode]” MGCL.

Paratypes (Figs. 5–6). BAHAMAS: N. Andros, Stafford Creek, Love at First Sight (Motel, at MVL), 24.901449°, -77.936089°, 18 m, 28.x.2011, J. Y. Miller, M. Simon, G. Goss, D. Matthews. J. Y. Miller et al. Bahamas Survey MGCL Accession No. 2011-32. MGCL 233027 McGuire Center for Lepidoptera & Biodiversity, FLMNH, UF (1 ♂ MGCL); Grand Bahama Island, Freeport, Sea Gate Ln., 26.504418°, -78.650936°, 24.x.2014, J. Miller, M. Simon, R. Rozycki, D. Matthews. Bahamas Survey MGCL Accession No. 2014-31. D. Matthews Genitalia Prep. # 1806. MGCL 238166 McGuire Center for Lepidoptera & Biodiversity, FLMNH, UF (1 ♂ MGCL).

Etymology. The species name is in honor of Donald J. Wright, whose tireless work on *Eucosma* and *Pelochrista* for the past 20 years has provided us with an understanding of these otherwise impossible groups.

Distribution and Biology. This species has been recorded from three islands in the Bahamas, with adults captured in June and October. Larval hosts are unknown. Specimens were collected in or near relict or larger tracts of rocky pineland dominated by *Pinus caribaea*. The holotype was collected in a relatively pristine tract of pineland on the outskirts of a recent housing development.

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