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# ARGYRIINI (LEPIDOPTERA: CRAMBIDAE) OF MISSISSIPPI AND ALABAMA WITH A REDESCRIPTION OF *ARGYRIA RUFISIGNELLA* (ZELLER)

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**Abstract:** The tribe Argyriini (Lepidoptera: Crambidae) is represented in Alabama and Mississippi by seven species of *Argyria* and *Urola*, all of which are associated with grasslands and other open habitats. *Argyria rufisignella* is a rarely collected species previously reported from Texas, Florida, and North Carolina. A series of this species recently was collected at Bibb County Glades Preserve, Alabama, a floristically unique habitat. The imago, wing venation, and genitalia of *A. rufisignella* are illustrated for the first time, and new distributional records are reported. Diagnoses, distribution maps, and photographs are provided as well for the other Argyriini that occur in Alabama and Mississippi.

**Additional key words:** *Urola*, distribution, grasslands, Bibb County Glades Preserve.

*Argyria* Hübner and related genera in the Argyriini (Crambidae: Crambinae) are considered to be restricted to the New World (Landry 1995). *Argyria* includes 38 species, of which seven occur in America north of Mexico, primarily in the eastern states and provinces (Klots 1983, Landry 1995, Landry 2003, Munroe 1995). The only other species of Argyriini in America north of Mexico is *Urola nivalis* (Drury).

*Argyria* species in America north of Mexico have been divided into three groups (Munroe 1995): one including *A. lacteella* (F.), one including *A. nummulalis* Hübner, *A. subaenescens* (Walker), and *A. rufisignella* (Zeller), and one including *A. auratella* (Clemens), *A. critica* Forbes, and *A. tripsacas* (Dyar), the latter three formerly assigned to *Vaxi* (Klots 1983). Hosts and immature stages are unknown for all species of *Argyria*, although most other Crambinae feed on grasses (Poaceae) (Landry 1995).

*Argyria* species and *U. nivalis* have short labial palpi, forewings dominated by a satiny-white color, and females with segment VIII dorsally shortened and bearing short anterior apophyses. *Argyria* species differ from *U. nivalis* in having male genitalia with a long, narrow uncus, rather than short and rounded, and a vinculum without an arm projecting posteriorly. The female ductus bursae is long and unsclerotized in *Argyria* species, and short and heavily sclerotized in *U. nivalis*.

*Argyria rufisignella* was described by Zeller (1872) as a species of *Catharylla* Zeller based on a male specimen collected by Jacob Boll in Texas (Landry, 1993). Dyar (1913) described *Argyria rileyella*, a junior synonym of *A. rufisignella*, from a male specimen, which was collected by C. V. Riley at an unknown locality and deposited at the U.S. National Museum of Natural

History (USNM). Only two other specimens of *A. rufisignella* are in the USNM, both collected at Southern Pines, North Carolina. Kimball (1965) listed a single record of *A. rufisignella* (as *A. rileyella*) from Myrtle Grove, Florida, but this specimen could not be located in the Florida State Collection of Arthropods (FSCA). Ed Knudson (personal communication) has collected a few specimens in Texas at Jeff Davis Co., Davis Mts. State Park, and Tyler Co., Big Thicket Nature Preserve, and Bernard Landry (personal communication) has a few specimens in his collection from Wisconsin at Burnett Co., Minnesota at Orrock, Sherburne CO., and Ontario, Canada at Grand Bend, but these were not examined.

A series of nine specimens of *A. rufisignella* was collected with blacklights recently in the Bibb County Glades, a Nature Conservancy Preserve in western Alabama (Fig. 1). The uniqueness of these glades, which are formed on Ketona Dolomite, has been documented in a treatment of the vascular flora that includes descriptions of eight new endemic taxa, one species, *Solanum pumilum* Dunal (Solanaceae), previously thought to be extinct, and more than 60 plant taxa of conservation concern (Allison and Stevens 2001).

The purpose of this contribution is to provide new distributional records for *A. rufisignella* in Alabama and other localities, to describe the male and female genitalia of this rarely collected species, and to provide distributional records for other species of Argyriini in Mississippi and Alabama.

## MATERIALS AND METHODS

Descriptions of female and male genitalia of *Argyria rufisignella* are based on material in the Mississippi Entomological Museum (MEM) at Mississippi State

University. Distribution records are based on material in the American Museum of Natural History (AMNH), Cornell University Insect Collection (CUIC), FSCA, MEM, USNM, and the private collections of Edward Knudson and Bernard Landry. Dissections of male and female genitalia and preparation of wing venation slides follow Landry (1995) with some modifications. Euparal was used as the mounting medium and Safranin and Chlorazol Black were used for staining genitalia. Genitalia and wings were illustrated and measured using a Leica MZ 12.5 stereomicroscope, a drawing tube, and a micrometer. Specimens were photographed and forewing lengths (FWL) were measured with the use of a Media Cybernetics Evolution MP digital camera (5 mega pixels) mounted on a Leica MZ 12.5 stereomicroscope with use of Image Pro Plus auto formatting software. Terminology for wing venation and genitalia structures follows Munroe and Solis (1998).

#### RESULTS

Seven species of *Argyriini* (Figs. 2-10) have been collected in Mississippi and Alabama (Fig. 11-14). Several of these species are associated with unique habitats including *A. nummulalis* and *A. auratella* from remnants of Black Belt Prairie and coastal savannas in Mississippi, *A. tripsacas* from coastal dunes in Alabama, and *A. rufisignella* from dolomite glades in Alabama. Other species have been collected primarily in fields and other open habitats where grasses and herbs dominate. *Argyria nummulalis* varies greatly in the color of the hindwing, ranging from almost white to various shades of brown (Figs. 4-6), in contrast to species of *Argyria* having little variation. A redescription of *A. rufisignella* and its distribution follows.

#### Redescription of *Argyria rufisignella* (Zeller)

Figs. 10, 12, 15-19

**Adult** (Fig. 10) *Head*: Head and appendages dark yellow except frons, base of proboscis, and base of labial palpus yellowish white.

*Thorax*: Silvery white with dark yellow longitudinal stripe medially.

*Forewing*: Length 6.0-6.72 mm (mean 6.38 mm) in female (n = 7), 4.80-5.12 mm (mean 4.96 mm) in male (n = 2). Silvery white with costal margin from base to near apex light brown; two brown spots, one in middle of costal margin and one in middle of dorsal margin, usually connected by weak yellow line; similar yellow line present between  $R_2$  and  $R_3$  on costa, extending weakly to  $M_1$ , sometimes extending to dorsal margin and forming spot; submarginal scales forming wide



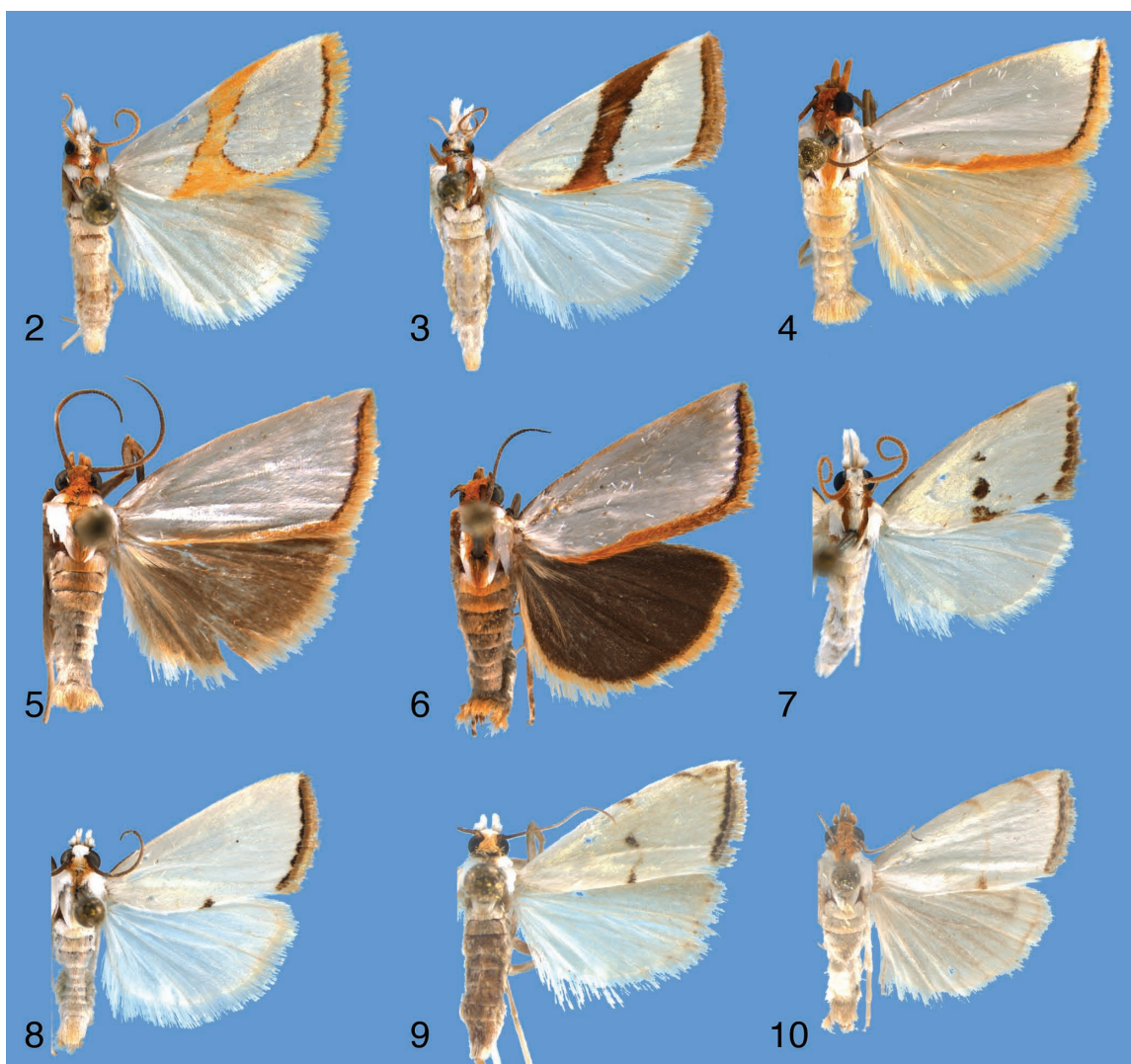
FIG. 1. Dolomite outcrops and vegetation at the Bibb County Glades Nature Conservancy Preserve.

yellow band from apex to tornus, bordered basally by line of dark brown scales; marginal scales short, brown. Venation (Fig. 15) with  $R_3$  and  $R_4$  stalked to near costa;  $M_2$  and  $M_3$  with bases approximate; discal cell closed apically.

*Hindwing*: White. Venation (Fig. 16) with Sc and  $R_1$  stalked to near costa; female frenulum with three spines.

*Male genitalia* (Figs. 17, 18): Intersegmental membrane with large hair pencil arising near base of tegumen, extending to more than one half the height of tegumen. Uncus relatively long, narrow, with down-curved apex, opposing similarly shaped gnathos. Valvae with basicostal arm, flattened, widened basally, and with macrotrichiae and small setae; mediocostal lobe subquadrate, basal half sclerotized, apical half membranous and supporting hair pencil consisting of five hairs dorsally, cucullus covered with long setae directed apically and striate dorsally; sacculus forming medial ridge. Vinculum broad and convex; pseudosaccus absent. Aedeagus with patch of basally directed spinules on dorsoapical surface; vassica without cornuti.

*Female genitalia* (Fig. 19): Segment VII with sternum and tergum smooth, evenly scaled, posterior half of tergum with scales and setae intermixed. Tergum VIII lacking scales and setae, expanded ventrolaterally, forming acute medioposterior angle and rounded medioanterior lobes projecting over ostium. Papillae anales with ventral one-fourth curved ventroposteriorly, posterior margin not cleft, with ventral surface moderately rugose, marginal setae long; apophyses posteriores long. Apophyses anteriores 0.23X length of apophyses posteriores. Ostium bursae forming invaginated and expanded antrum beneath sternum VII, posteriorly bordered by two concave, slightly sclerotized depressions. Ductus bursae



FIGS. 2-10. Species of *Argyria* and *Urola* in southeastern United States. (2) *A. auratella* (FWL 7.40 mm), (3) *A. critica* (FWL 11.43 mm), (4) *A. nummulalis* (FWL 11.17 mm), (5) *A. nummulalis* (FWL 12.69 mm), (6) *A. nummulalis* (FWL 12.07 mm), (7) *A. tripsacas* (FWL 6.28 mm), (8) *U. nivalis* (FWL 10.00 mm), (9) *A. lacteella* (FWL 5.47 mm), and (10) *A. rufisignella* (FWL 9.56 mm).

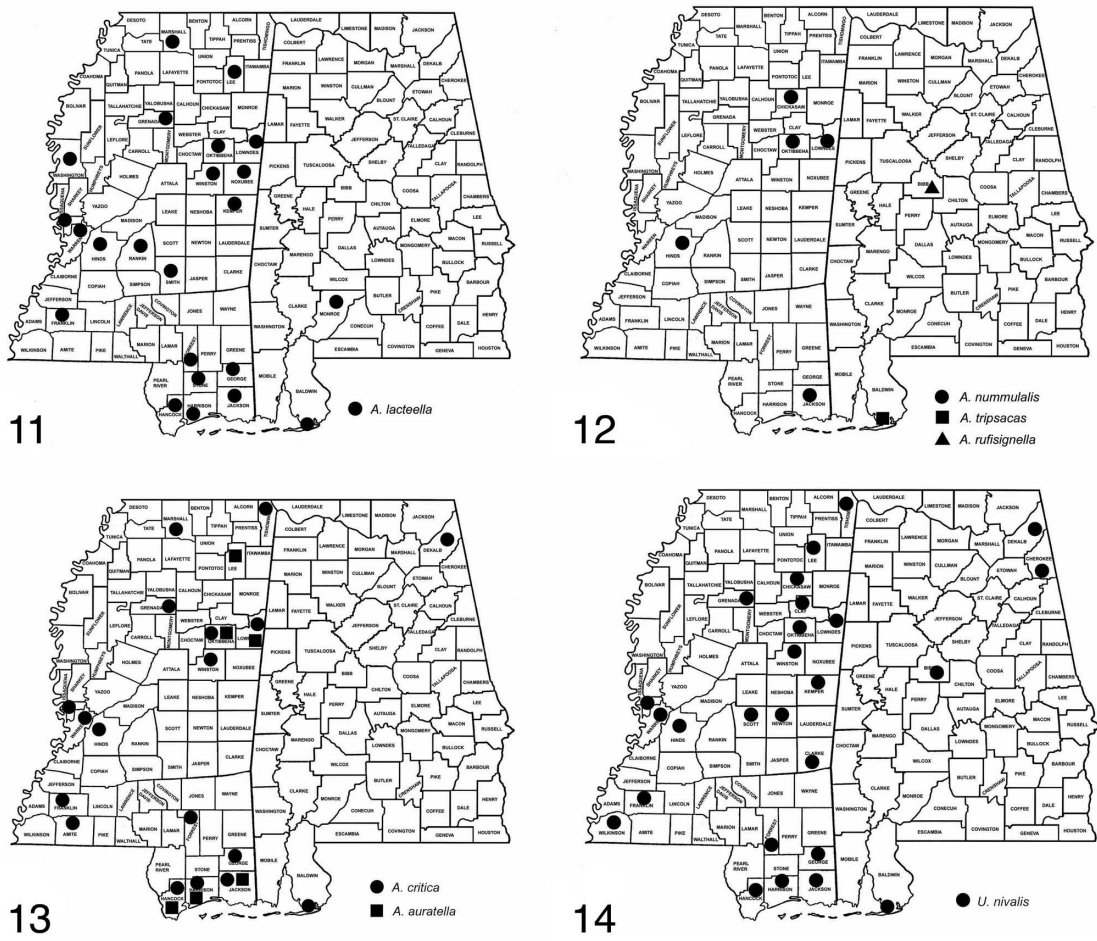
moderately long, membranous, with ductus seminalis originating near middle. Corpus bursae membranous.

**Diagnosis:** Forewing veins  $R_3$  and  $R_4$  are partly fused in *A. rufisignella*, *A. critica*, *A. auratella*, and *U. nivalis*, whereas they are completely fused in *A. nummulalis* and separate in other species. Vein  $R_5$  is separate from  $R_{3+4}$  in *A. rufisignella* and *U. nivalis*, but it is fused with the basal portion of  $R_{3+4}$  in *A. critica* and *A. auratella*. The male genitalia of *Argyria rufisignella* differ from other species of *Argyria* and *Urola nivalis* as follows: 1) the uncus has a pointed and straight apex, whereas the apex is rounded or bent in the other species; 2) the valva has a distinctive form in *A. rufisignella*, differing from, other species. In particular, the mediocostal lobe of the valvae is rectangular in *A.*

*rufisignella*, whereas it is rounded or absent in other species. The female genitalia differ as follows: 1) the papillae anales have long marginal setae, whereas marginal setae are short or absent in other species; 2) tergum VIII is expanded ventrolaterally, forming an acute medioposterior angle and rounded medioanterior lobes that project over the ostium, whereas the tergum is not expanded in other species; 3) the ductus bursae is membranous in *Argyria* species and sclerotized in *U. nivalis*, and is relatively short compared to length of sternum VII in *A. rufisignella* and relatively long in other species.

**Material examined and distribution:** Alabama: Bibb Co., Bibb Co. Glades Preserve, 33°03'26"N 87°02'02"W, 4 June 2003, R.L. Brown, S.M. Lee, J.A.

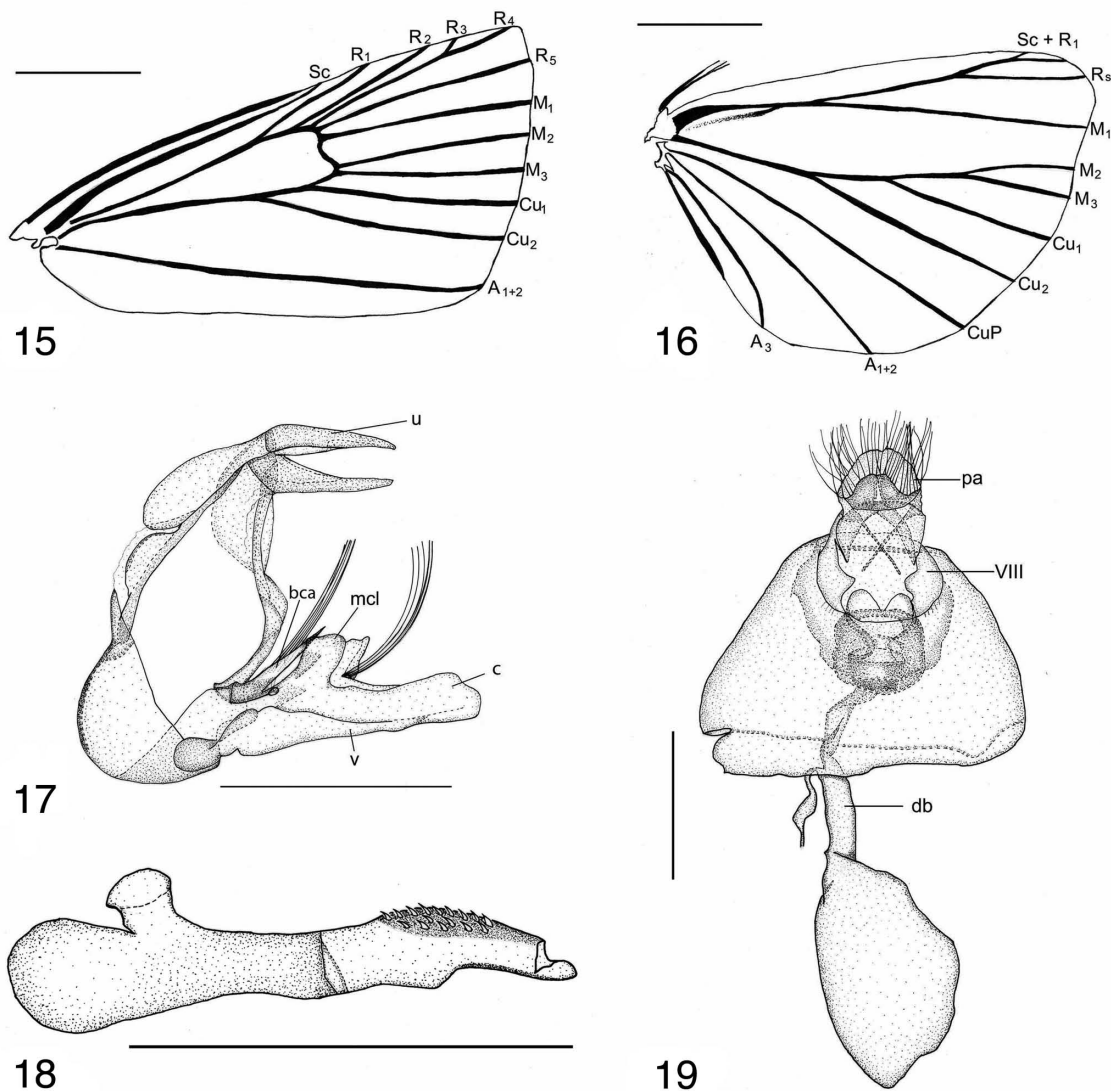




FIGS. 11-14. Distribution maps of *Argynia* species and *Urola nivalis* in Mississippi and Alabama. (11) *A. lacteella*, (12) *A. nummulalis*, *A. tripsacas*, and *A. rufisignella*, (13) *A. critica* and *A. auratella*, and (14) *U. nivalis*.

Key to species of *Argyniini* in southeastern United States

- 1. Forewing with oblique brown or yellow band ..... 2
- 1'. Forewing without oblique band ..... 3
- 2. Forewing with oblique band light yellow, widened on dorsum ..... *A. auratella* (Fig. 2)
- 2'. Forewing with oblique band yellowish brown to dark yellow, not widened on dorsum ..... *A. critica* (Fig. 3)
- 3. Forewing dorsum and fringe margined with yellow, dorsum without dark spot ..... *A. nummulalis* (Fig. 4-6)
- 3'. Forewing dorsum without yellow margin, fringe with or without yellow margin, dorsum with dark spot near middle ..... 4
- 4. Thorax with two, dark yellow, longitudinal stripes ..... *A. tripsacas* (Fig. 7)
- 4'. Thorax with one, light yellow, longitudinal stripe ..... 5
- 5. Forewing without dark spots on costa, fringe brown ..... *U. nivalis* (Fig. 8)
- 5'. Forewing with two or more dark spots on costa, fringe yellow or brown ..... 6
- 6. Forewing discal cell with dark spot, fringe brown ..... *A. lacteella* (Fig. 9)
- 6'. Forewing discal cell without dark spot, fringe yellow ..... *A. rufisignella* (Fig. 10)



FIGS. 15-19. *Argyria rufesignella*. Scale bar = 1mm. (15) forewing (female), (16) hindwing (female), (17) Male genitalia, (18) Aedeagus, (19) Female genitalia. (bca) basicostal arm, (c) cucullus, (db) ductus bursae, (mcl) mediocostal lobe, (pa) papillae anales, (u) uncus, (v) valva, (VIII) tergum VIII.

MacGown (2 ♂, 7 ♀; MEM). Florida: Okaloosa Co., Shalimar, 20 Aug. 1964 (1, sex not recorded), Ocean City, 7 June 1963 (1, sex not recorded), H.O. Hilton (FSCA). Georgia: [county unknown] Spring Ck., 18-21 May 1916, J.C. Bradley, (1 ♀, genitalia slide A.B. Klots 24 Oct. 1965 #2; CUIC). North Carolina: Moore Co., Southern Pines, Aug. 24-30 (1 ♂, genitalia slide CH 28 Apr 32 #17, 1 ♀, genitalia slide CH 28 Apr. 32 #22; USNM).

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