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A NEW SPECIES OF *PHANETA*, WITH TAXONOMIC DIAGNOSES AND SEASONAL AND GEOGRAPHICAL DATA ON FOUR RELATED SPECIES (TORTRICIDAE)

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ABSTRACT. ***Phaneta canusana***, new species, is described and compared with *P. lapidana*, *P. sublapidana*, *P. kokana* and *P. ambodaidaleia*. Lectotypes are designated for *P. lapidana* and *P. sublapidana*. Imagos of the five species, the male genitalia of *P. lapidana* and *P. sublapidana* and the male and female genitalia of *P. canusana* are illustrated. *P. canusana* is associated with prairie remnants in Ohio, Kentucky, Missouri, and Mississippi. New distribution records are given for *P. kokana* and *P. ambodaidaleia*.

Additional key words: vernal flight, autumnal flight.

The genus *Phaneta* Stephens consists of 102 species in North America, including eight described since publication of the most recent check list for North American members of the genus (Powell 1983). This group was treated by Heinrich (1923) as *Thiodia*, distinguishable from *Eucosma* by the absence of a costal fold on the male forewing. Obraztsov (1952) restricted *Thiodia* to a group of European species and considered *Phaneta* to be the correct generic name for the Nearctic species.

While surveying the lepidopteran fauna of Lynx Prairie Preserve, Adams County, Ohio, in 1989 and the Osborn prairie remnant of the Mississippi Black Belt in 1991, we recorded an unknown species of *Phaneta*, described below as new. Representatives of this same species had been collected in Missouri by J. Richard Heitzman in 1976, and they were brought to our attention by W. E. Miller, who recognized the conspecificity of the Missouri and Ohio specimens. The new species has similarities with four other members of the genus: *P. lapidana* (Walsingham), *P. sublapidana* (Walsingham), *P. kokana* (Kearfott), and *P. ambodaidaleia* Miller.

In examining olethreutine type specimens residing in European collections, Obraztsov selected specimens to serve as lectotypes for Walsingham's species, but he never published those designations. His notes and photographs of this material are currently on loan to the Mississippi

Entomological Museum from the American Museum of Natural History (AMNH), and based on that information, lectotypes are designated in this paper for *P. lapidana* and *P. sublapidana*.

During this study, specimens from the following institutional and personal collections were examined: Horatio T. Enterline (HTE), Loran D. Gibson (LDG), J. Richard Heitzman (JRH), Illinois Natural History Survey (INHS), Mississippi Entomological Museum (MEM), United States National Museum of Natural History (USNM), Donald J. Wright (DJW), and Zoological Museum, Copenhagen (ZM).

Phaneta sublapidana (Walsingham)
(Figs. 1, 2)

Semasia sublapidana, Walsingham 1879:59, pl. 73, fig. 9 (imago)
Thiodia sublapidana, Fernald [1903]:462; Heinrich 1923:50, fig. 122 (male genitalia); McDunnough 1939:44.
Eucosma sublapidana, Barnes & McDunnough 1917:no. 7086.
Phaneta sublapidana, Powell 1983:33.

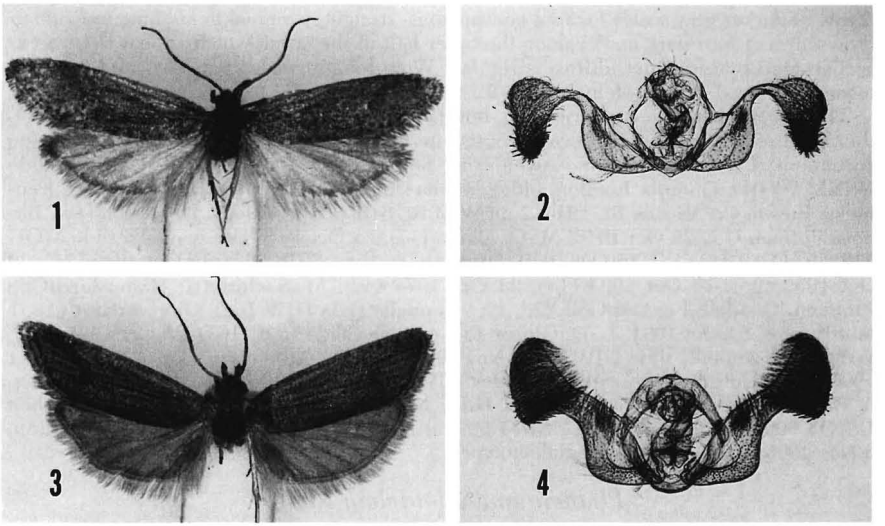
Semasia sublapidana was described from four males collected near Klamath Lake, Oregon. A **lectotype** for *Semasia sublapidana* Walsingham is hereby designated (Fig. 1): male, "(nr. Fort Klamath), Jackson Co., Oregon, 21–23 IX 1871, Wlsm." BM genitalia slide 11599 (Fig. 2). The lectotype is deposited in The Natural History Museum, London (BMNH). According to Obraztsov's notes on the envelope containing the photograph of the lectotype, this was the specimen figured by Walsingham (1879).

We examined the following specimens: California: Mono Co., NE side Mono Lake, 6500', XI-19-93, D. Giuliana, 1400 PST [Pacific Standard Time], 46° F (1). Inyo Co., Deep Spr. Vy., 5300', XI-23-93, D. Giuliana, 1600 PST, 36° F (1) (UCB). J. Powell (pers. comm.) collected a series of 18 males during the second week of December, 1995 in the Owens Valley, Inyo County. These individuals were flying just before sunset, which occurs at 1600 h in December in the eastern shadow of the Sierra Nevada Mountains.

Phaneta lapidana (Walsingham)
(Figs. 3, 4)

Semasia lapidana, Walsingham 1879:58, pl. 73, fig. 8 (imago)
Thiodia lapidana, Fernald [1903]:462; Heinrich 1923: 50; McDunnough 1939:44.
Eucosma lapidana, Barnes & McDunnough 1917:no. 7085.
Thiodia lepidana, Heinrich 1929:2, fig. 7 (male genitalia) [missp.].
Phaneta lapidana, Powell 1983:33.

The description of *Semasia lapidana* was based on one male and two females collected at Crooked River near Klamath Lake, Oregon on September 22, 1871. A **lectotype** for *Semasia lapidana* Walsingham is hereby designated (Fig. 3): male, "Crooked R. (nr. Fort Klamath) Jackson Co., Oregon, 21–23 IX 1871, Wlsm." BM genitalia slide 11598 (Fig. 4). The lectotype is deposited in BMNH. According to Obraztsov's notes on the envelope containing the photograph of the female cotype of *S. lapidana*, the detached abdomen accompanying this specimen is that of a male. Obraztsov's photograph of this male genitalia reveals that it belongs to a specimen of *Epinotia columbia* (Kearfott), which has been treated historically as a junior synonym of the Palearctic species, *E. crenana* (Hübner). The latter was also collected by Walsingham at Crooked River and misidentified as a smaller form of *Epinotia* (sensu *Proteopteryx*) *emarginana* (Walsingham) (1879: pg. 69). We examined the following specimen: British Columbia: Chilcotin, 15-IX-1925, George V. Copley.



FIGS. 1–4. Lectotypes of *Phaneta* species described by Walsingham from Jackson County, Oregon. **1,** *P. sublapidana*, male imago; **2,** *P. sublapidana*, male genitalia, B.M. slide 11599; **3,** *P. lapidana*, male imago; **4,** *P. lapidana*, male genitalia, B.M. slide 11598.

Phaneta kokana (Kearfott)
(Fig. 5)

Eucosma kokana, Kearfott 1907:29.
Eucosma chortaea, Meyrick 1912:35 [invalid repl. name].
Hystricophora kokana, Heinrich 1923:259 (lectotype designation).
Thiodia sororiana, Heinrich 1923:263, fig. 421 (male genitalia); McDunnough 1939:44 (as subspecies of *Thiodia kokana*).
Thiodia kokana, Heinrich 1924:387; McDunnough 1939:44.
Phaneta kokana, Powell 1983:33; Godfrey et al. 1987:35.

Eucosma kokana was based on a female from Cincinnati, Ohio and a male from Scranton, Pennsylvania. Heinrich (1923) designated the female as lectotype and placed the species provisionally in *Hystricophora*. In the appendix to that same paper, Heinrich described *Thiodia sororiana* and figured the male genitalia based on specimens from Aweme, Manitoba, noting that he had seen specimens of the same species from Ontario, Canada in the Fernald Collection. He stated that the forewing had a dark band bordering the termen, differentiating it from *P. lapidana*, and that it most closely resembled *Hystricophora kokana* (Kearfott), based on examination of a female specimen of the latter. Following receipt of additional specimens of *P. kokana* from Cincinnati, Heinrich (1924) synonymized *T. sororiana* with *E. kokana* and transferred *kokana* to *Thiodia*. To confirm the identity of our specimens, a photograph of a female was compared with the lectotype of *P. kokana* in the AMNH.

In *P. kokana* the forewing is divided roughly into a dark basal area and pale apical area, the latter extending from beyond the middle of the costa across the wing to the tornus and outward to the apex. The basal area bears a mixture of light brown scales, gray scales, and gray scales with white or black tips. The white tipped scales are concentrated along the costa, and the black tipped scales are distributed evenly except towards the inner margin where they are more dense. The varying number of brown scales produces an effect ranging from a light shading to a predominantly brown color. The apical portion of the wing is clothed largely with white and light gray scales with white apices; specimens with extensive suffusing of brown in the basal area have some brown scales in the apical area as well.

A row of darker gray scales forms a conspicuous, straight, terminal line. Some individuals show three or four dark marks along the outer half of the costa, which appear to be areas accentuated by indistinct, diffuse strigulae. Wing length: males 9.2–11.5 mm (n = 18; mean = 10.2; s.d. = 0.47), females 8.3–9.7 mm (n = 3; mean = 9.2).

This species has a wide distribution, but its scarcity in collections suggests that it is either localized or overlooked because of its late flight period. We examined the following specimens: Canada. Manitoba: Aweme, 22 Sept 1921, N. Criddle (1♂, genitalia slide USNM 70001). Ontario: London, (4♂; genitalia slide USNM 70000). United States. Kentucky: Rowan Co., E side Rt. 1274, 2 mi W of Rt. 519, 8 Nov 1994, L.D. Gibson (1♂). Illinois: Putnam Co., 22 Oct 1946, M. O. Glenn (1♂), 25 Oct 1946 (1♂; genitalia slide MOG 219), 10 Oct 1949 (1♂), 16 Oct 1949 (2♂; genitalia slide DJW 103), 18 Oct 1949 (2♂), 29 Oct 1950 (2♂), 28 Oct 1964 (1♂), 24 Oct 1974 (1♂). Massachusetts: Hampshire Co., Amherst, Goodell, Fernald Coll. (2♂, 1♀; ♀ genitalia slide DJW 102). Ohio: Adams Co., 1 mi SE Lynx, 24 Oct 1991, L. D. Gibson (3♂; genitalia slide LDG 161), 25 Oct 1991, D. J. Wright (1♂; genitalia slide DJW 48), 4 Nov 1994 (20♂, 5♀), Athens Co., Ames Twn., 31 Oct 1990, H. T. Enterline (2♂; genitalia slides DJW 49, 50); Hamilton Co., Cincinnati, 3 Oct, A. Braun (♀, lectotype, genitalia slide C.H.), 7 Nov 1918, A. Braun (1♂, 1♀; ♂ genitalia slide USNM 69998, ♀ genitalia slide USNM 69999). Pennsylvania. Lackawanna Co., Scranton, 8 Nov 1905, A. E. Lister (1♂, paralectotype).

Phaneta ambodaidaleia Miller
(Fig. 6)

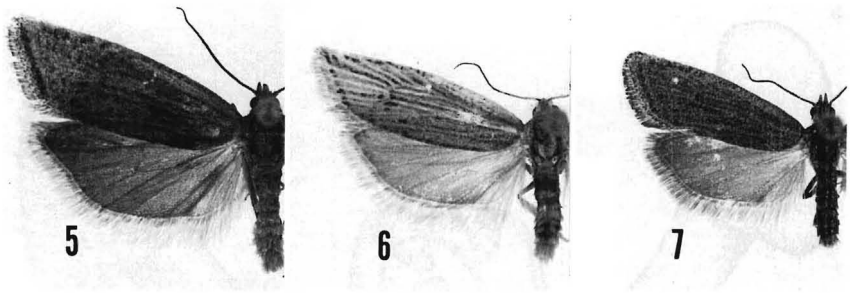
Phaneta ambodaidaleia, Miller 1983:101, figs. 12–14 (imago, female and male genitalia); Miller 1987:47 (figs. imago, male and female genitalia).

Miller (1983) described this species from Kentucky (Oldham Co.), Michigan (Ingham Co.), Missouri (Jasper Co.), North Carolina (Carteret Co.), and South Carolina (Charleston Co., type locality). The forewing ground color is creamy white, being most evident between the costa and radial vein. Between the radial and cubital veins, it has brownish ochreous longitudinal streaks extending from the base outward through the cell. From the distal edge of the cell to the termen the brownish ochreous streaks are between the veins, accenting the creamy white on the veins. In most specimens the area between the cubitus and inner margin is suffused with brownish gray. The forewing is overlaid with a sprinkling of dark brown dots, accentuated on the apical half of costa and the outer margin. The dots on the outer margin occur between veins, creating the impression of an intermittent terminal line. Wing length: males 9–10.5 mm (n = 24; mean = 9.1; s.d. = 0.33); females 7.9–8.3 mm (n = 4; mean = 8.1).

We add the following records: Alabama: Baldwin Co., Bon Secour N.W. Ref., T9S, R2E, Sec 24, 18 Jan 1993 (1♂). Georgia: Clinch Co., DuPont, 19 Feb 1983 (1♀). Kentucky: Bullitt Co., N side Rt. 480, 6.9 mi E Rt. 61, 30 Mar 1993, L. D. Gibson (6♂; wing slide LDG 1), D. J. Wright (1♂). Mississippi: Hancock Co., Stennis Space Center, 27 Jan 1993, R. Kergosien (1♂); Harrison Co., Long Beach, 6 Feb 1994, R. Kergosien (3♂); Lee Co., Tombigbee State Park, 10–31 Mar 1993, R. Kergosien (1♂); Oktibbeha Co., 6 mi SW Starkville, 24 Feb 1985, R. L. Brown (1♂, genitalia slide RLB 1665), 2 Mar 1985 (4♂), 3 Mar 1985 (1♂), 9 Mar 1986 (1♂), T18N,R14E, Sec 33 SE, 2 Mar 1991 (3♂), 4 Mar 1991 (1♂), Mississippi State University North Farm, 6 Mar 1991 (1♀), T19N,R15E. Sec 16 [Black Belt Prairie], 5 Mar 1991, D. M. Pollock (1♂). Ohio: Adams Co., Lynx Preserve, 20 Mar 1991, D. J. Wright (4♂; genitalia slides DJW 47, 74), 1 mi SE Lynx, 20 Mar 1991, L. D. Gibson (4♂; genitalia slide LDG 162), 7 Apr 1992 (3♂), 26 Mar 1993, L. D. Gibson (1♂), D. J. Wright (4♂), 8 Apr 1993, D. J. Wright (4♂,1♀). South Carolina, Charleston Co., McClellanville, 20 Mar 1968, R. W. Hodges (2♀; genitalia slides DJW 82, 102).

***Phaneta canusana* Wright, new species**
(Figs. 7–9)

Description. *Head:* Scales on vertex, upper frons, and labial palpi brownish gray, shading toward white at their bases, with distinctly white tips. Antennae finely pubescent ven-



FIGS. 5–7. Males of *Phaneta* species from Adams County, Ohio. **5,** *P. kokana*; **6,** *P. ambodaidaleia*; **7,** P. canusana, holotype.

trally, covered dorsolaterally with narrowly white-tipped, brownish gray scales. *Thorax:* Mesonotum and tegulae concolorous with head. *Forewing* (Fig. 7). Wing length: males 7.1–10 mm (n = 39; mean = 8.6; s.d. = 0.64), females 6.9–7.6 mm (n = 4; mean = 7.3). Dorsal vestiture a mixture of gray to brownish gray scales, mostly tipped with white, producing a unicolorous ashy gray appearance; some individuals with darker scales between veins and lighter scales on veins producing weakly highlighted veins and striate appearance; outer margin of wing with thin, distinct, dark gray terminal line at edge of wing membrane, accentuated by white bases of scales in basal row of fringe; fringe scales brownish gray with white apices. *Hindwing:* Upper side and fringe scales uniformly light brownish gray, with darker scales usually accenting the veins and wing margins. *Male genitalia* (Fig. 8): Tegumen widened dorsally; uncus reduced to rudimentary setose lobe; socii short, slightly flattened, with lateral margin convex, median margin concave; aedeagus short, with more than 20 cornuti; juxta with short caulis, anellus not closely surrounding aedeagus ventrally; valva with base of sacculus sparsely setose, with large group of dense setae on basal medial area, neck sparsely setose on ventral margin, cucullus sub-triangular with median surface angled from dorsal edge of valva and overlapping neck ventrally (13n). *Female genitalia* (Fig. 9): Sternum VII densely scaled on anterolateral and posterolateral corners and medial area anterior to ostium, sparsely scaled elsewhere, anteriorly rugose; tergum VIII sparsely setose on lateral extensions and posterior half of dorsum, scales absent; papillae anales facing laterally, setae sparse on medial and dorsal areas of pads, more dense on ventral margins; lamella postvaginalis with lateral margins slightly concave, with shallow longitudinal groove medially, with four or five setae in irregular pattern, microtrichiate throughout; ductus bursae with moderately sclerotized colliculum posterior to inception of ductus seminalis; width of smaller signum less than one half greatest width of larger signum (2n).

Types. *Holotype* ♂, "OH: Adams Co., Lynx Prairie Preserve, Station 6, March 17, 1989, leg. D. J. Wright." Type locality at 38°45'40"N 83°24'46"W. The holotype is deposited in USNM. *Paratypes.* Kentucky: Bullitt Co., Co. Rd. 480, 7 mi E of Shepherdsville, 30 Mar 1993, D. J. Wright (1♂, 1♀; ♀ genitalia slide DJW 104), N side Rt. 480, 6.9 mi E Rt. 61, 30 Mar 1993, L. D. Gibson (1♂); Rowan Co., E side Rt. 1274, 2 mi W Rt. 519, 13 Mar 1995, L. D. Gibson (9♂, 2♀). Mississippi: Oktibbeha Co., T19N,R15E, Sec. 16 [also known as "Osborn Prairie"; 33°30'41"N 88°44'08"W], 10 Feb 1991, Black Belt Prairie, D. M. Pollock (5♂), 13 Feb 1992, R. L. Brown (5♂), 2 Feb 1995, R. L. Brown (1♂). Missouri: Benton Co., 3 miles NW of Warsaw on State Hwy UU [data are inaccurate as Hwy UU intercepts State Highway 7 at 5 miles NW of Warsaw], 28 Feb 1976, J. R. Heitzman (1♂; genitalia slide D. Hagler 924803), 2 Mar 1976, J. R. Heitzman (2♂; genitalia slides D. Hagler 610801, 729802). Ohio: Adams Co., Lynx Prairie Preserve, 17 Mar 1989, D. J. Wright (1♂, 1♀, ♂ genitalia slide LDG 78, ♀ genitalia slide W. E. Miller 1112921), 1 mi. S. E. of Lynx, 20 Mar 1991, L. D. Gibson (4♂, genitalia slide LDG 160), D. J. Wright (1♂, genitalia slide DJW 76), 2 Mar 1992, D. J. Wright (7♂; genitalia slides DJW 51, 52, 75, W. E. Miller

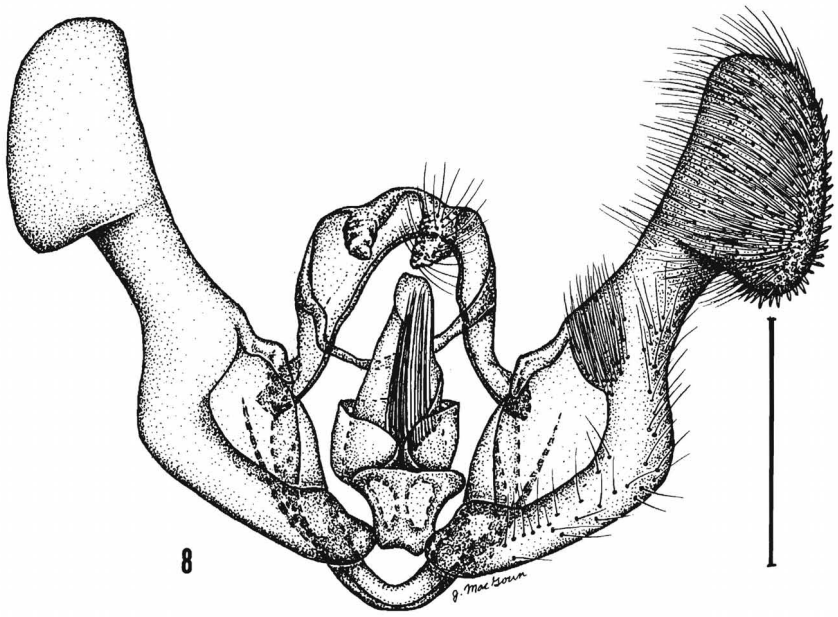


FIG. 8. *Phaneta canusana*, male genitalia. Adams County, Ohio, slide W. E. Miller 1112922. Scale line 0.5 mm.

812922, 1112922), 4 Mar 1992, L. D. Gibson (3♂; wing slide LDG 2), 26 Mar 1993, L. D. Gibson (1♂), D. J. Wright (5♂), 8 Apr 1993, D. J. Wright (3♂). South Carolina: Greenville, 23 Feb 1982, Richard S. Peigler (1♂; genitalia slide R. L. Brown 1565). Paratypes are deposited in collections of DJW, Cincinnati, OH, LDG, Florence, KY, JRH, Independence, MO, AMNH, CNC, MEM, USNM, ZM, Copenhagen [R. Peigler donation].

Diagnosis. *Phaneta sublapidana* and *P. lapidana* are western species with fall flight periods. Heinrich (1923) considered them to be closely related, apparently based on Walsingham's descriptions and an examination of a cotype of *Semasia sublapidana*. He separated them in his key by Walsingham's description of the setation of the male antennae, stating that it is "strongly pubescent" in *sublapidana* and "nearly smooth" in *lapidana*. He later obtained specimens of *P. lapidana* from British Columbia and commented (1929) "*lepidana* [sic] resembles *kokana* Kearfott, which may be nothing but an eastern variety." The male specimen of *P. sublapidana* that we examined has dense setae covering about two-thirds the circumference of each flagellomere, the setae being subequal in length with the width of the flagellomere. The female of *P. sublapidana* has sparce setae restricted to less than a third of the flagellomere circumference, and the setae are much shorter than the flagellomere's width. The male specimen of *P. lapidana* that we examined has a narrow strip on the ventral surface of each flagellomere covered with setae that are subequal in length with the width of the flagellomere. The remainder of the circumference of the flagellomere is covered with white scales. Although the forewing ground color is similar in both species, *P. sublapidana* differs from *P. lapidana* and *P. canusana* in having a contrasting light apical area beyond the discal cell in which light gray scales are intermixed with grayish orange and light brown scales. *Phaneta sublapidana* differs from the other species treated here in having male genitalia with a deep and wide ventral emargination of the valval neck (Fig.2). *Phaneta lapidana* is similar to *P. canusana* in both forewing color and male genitalia.

Phaneta kokana, *P. canusana* and *P. ambodaidaleia* are eastern species that are sym-

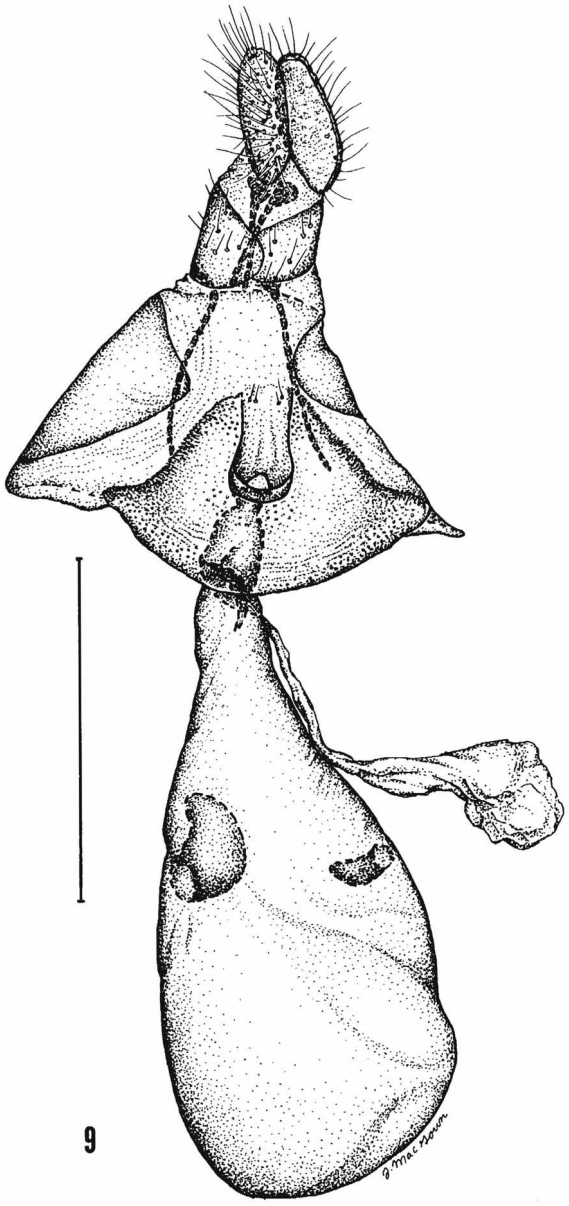


FIG. 9. *Phaneta canusana*, female genitalia. Bullitt County, Kentucky, slide D. J. Wright 104. Scale line 1.0 mm.

patric in at least part of their ranges. They have been collected at a single site in Adams Co., Ohio. Their genitalia are similar. In males of *P. ambodaidaleia*, the basal portion of the cucullus that overlaps the valval neck has a convex margin. This margin is straight from the ventral corner of the cucullus to the neck in the other two species. Wing color and flight period provide reliable means of differentiating the three species. The ground color of the forewing in *P. ambodaidaleia* is creamy white, and that of *P. kokana* and *P. canusana* is gray. In *P. kokana* the ground color is suffused with light brown scales in the basal area and white or white tipped scales in the apical third of the wing, thereby distinguishing its appearance from that of *P. canusana*, which is unicolorous gray. Mean forewing lengths of males of the three species differ significantly, with *P. canusana* being the smallest and *P. kokana* the largest. The flight period of *P. kokana* varies from late September to early November, depending on latitude, whereas *P. ambodaidaleia* and *P. canusana* fly in the spring. Earliest capture dates for *P. ambodaidaleia* range from January on the Gulf Coast in Alabama and Mississippi to February 24 in Oktibbeha County, Mississippi and March 20 in Adams County, Ohio. In Ohio the flight period of *P. canusana* begins one to two weeks earlier than that of *P. ambodaidaleia* and partially overlaps the latter in late March and early April. A similar staggering of flight periods occurs in Mississippi, although no overlap has yet been recorded.

Habitat. *Phaneta canusana* appears to be associated with a habitat supporting prairie vegetation, based on extensive collecting in various physiographic regions in Ohio, Kentucky, Missouri, and Mississippi. The Lynx Prairie Preserve and adjacent collection site one mile SE of Lynx are among an extensive group of small openings in the otherwise forested ridge tops and valleys of the unglaciated portion of southern Ohio. The Kentucky sites in Rowan and Bullitt Counties are similar, but do not possess the plant diversity of the Ohio localities. The Missouri specimens come from the vicinity of the Osage Plains, which contains many of the state's native prairies, and the single South Carolina specimen was collected at a porch light in a developed suburb of Greenville. The latter locality was originally wooded, and in 1982 the nearest open habitat supporting prairie plants was about three miles distant from the collection site.

The preference for a prairie habitat is supported by collections in the Black Belt physiographic region of Mississippi, an area discretely defined by an underlying layer of Selma Chalk that extends in a crescent shape from northern Mississippi to southeastern Alabama. Nine prairie remnants in the Black Belt of Mississippi have been sampled with blacklights on 93 nights since 1990; of these, three remnants were sampled on 16 nights in January, February, and March. *Phaneta canusana* was collected at the Osborn prairie remnant on three of the four nights during February but not in January or March. Neither *P. canusana* nor *P. kokana* was collected at this site during eight nights in September, eight nights in October, and four nights in November. Other types of habitats in the Lower Coastal Plains, Jackson Prairie, Alluvial Plain, Loess Hills, and Flatwoods physiographic regions (as mapped in Testa and Lago, 1994) have been extensively sampled over many years during January–March without producing records of the new species. Larval hosts have not been recorded for any of the five species discussed in this paper, but they probably are Asteraceae, as is the case with other species in the genus.

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