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NOTES ON THE *BALANOTES* (MEYRICK) GROUP OF *OIDAEMATOPHORUS* WALLENGREN WITH DESCRIPTION OF A NEW SPECIES (PTEROPHORIDAE)

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The separation of *Oidaematophorus balanotes* (Meyrick), *O. grandis* (Fish), *O. lacteodactylus* (Chambers) and *O. kellicottii* (Fish) has been difficult. Barnes and Lindsey (1921) used alar expanse and maculation, length of palpus and certain genitalic characters to distinguish these species. The accumulation of additional material, however, reveals that all of the above characteristics are subject to great variation within species. To more clearly define the taxa of this complex, an intensive study of the genitalia of both sexes was made. For males consistent differences between species were found in a secondary structure (hereinafter referred to as the "clasper") on the inner surface of the left valva. Differences in the anterior margins of the eighth tergites and in the configurations of the anterior apophyses aid in separating the females.

Non-genitalic characters were unreliable. Because it was difficult to associate males with females, the sexes were associated chiefly by localities. Further studies will include rearing larvae to confirm the relationships of the sexes.

Oidaematophorus balanotes (Meyrick)

(Figures 1, 6, 9; Map 1)

Pterophorus balanotes Meyrick 1908: 503.

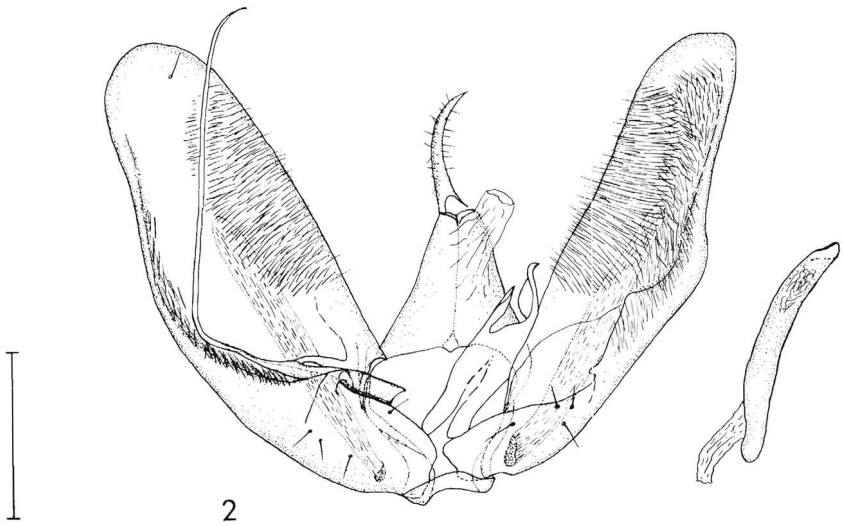
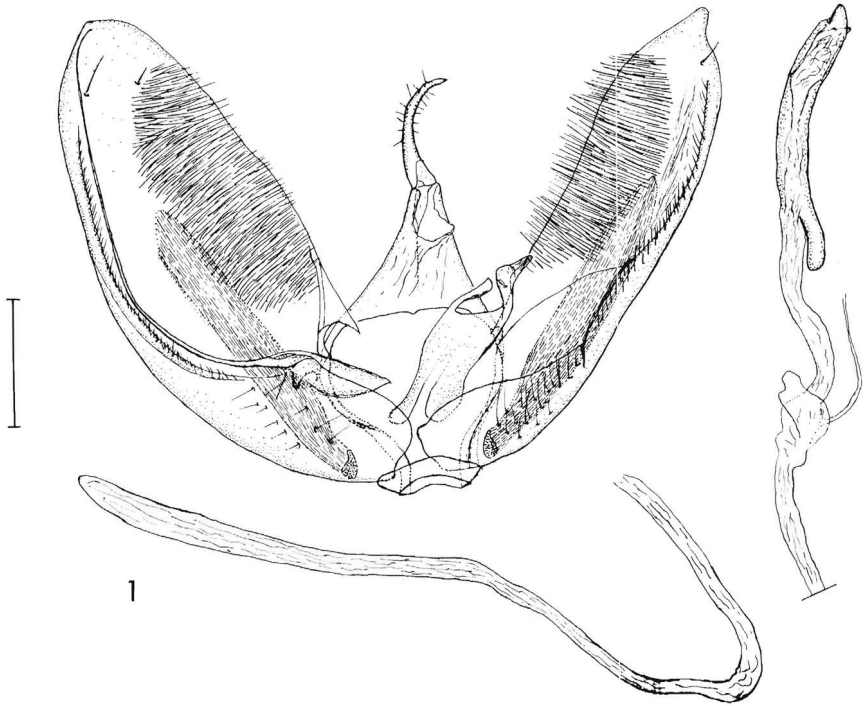
Pterophorus aquila Meyrick 1908: 503.

Oidaematophorus balanotes, Barnes and Lindsey 1921: 429.

Alar expanse: 31–42 mm.

Head: Scales brown, brownish white between antennal bases. Antenna brownish white. Labial palpus brownish white with brown tips, slender and erect, extending beyond antennal base.

Thorax: Scales brownish white. Forewing scales brownish white, an indistinct brown dash extending from base to near cleft; usually one or two small dark brown



spots proximal to cleft; tips of some or all veins dark brown (photograph in Barnes and Lindsey 1921: Pl. XLIV, Fig. 12). Hindwing brownish white to pale brown. Legs brownish white; foreleg and midleg brown mediad, midtibia more heavily scaled than other tibiae.

Abdomen: Scales brownish white with indistinct brown longitudinal lines on tergum, pleuron and sternum.

Male genitalia (Fig. 1): Tegumen triangulate. Uncus attenuate, curved ventrad. Vinculum narrow, arched ventrad. Valvae asymmetrical with hair-pencil tufts on outer surfaces; left valva longer and wider, apex pointed, inner surface with a long, curved, finely drawn clasper. Juxta well developed, directed toward right side, right arm extending beyond left. Aedeagus slightly curved, coecum well developed.

Female genitalia (Figs. 6, 9): Pouch for sex pheromone gland prominent (everted in drawing). Posterior apophysis long and slender. Anterior apophysis short, curved posteriorly and ventrad. Tergite VIII with lateral margin excavate posteriorly to anterior apophysis. Ostium bursae opening to left posterior margin of sternite VIII. Ductus bursae and corpus bursae membranous. Inception of ductus seminalis at anterior of corpus bursae, appendix bursae well developed.

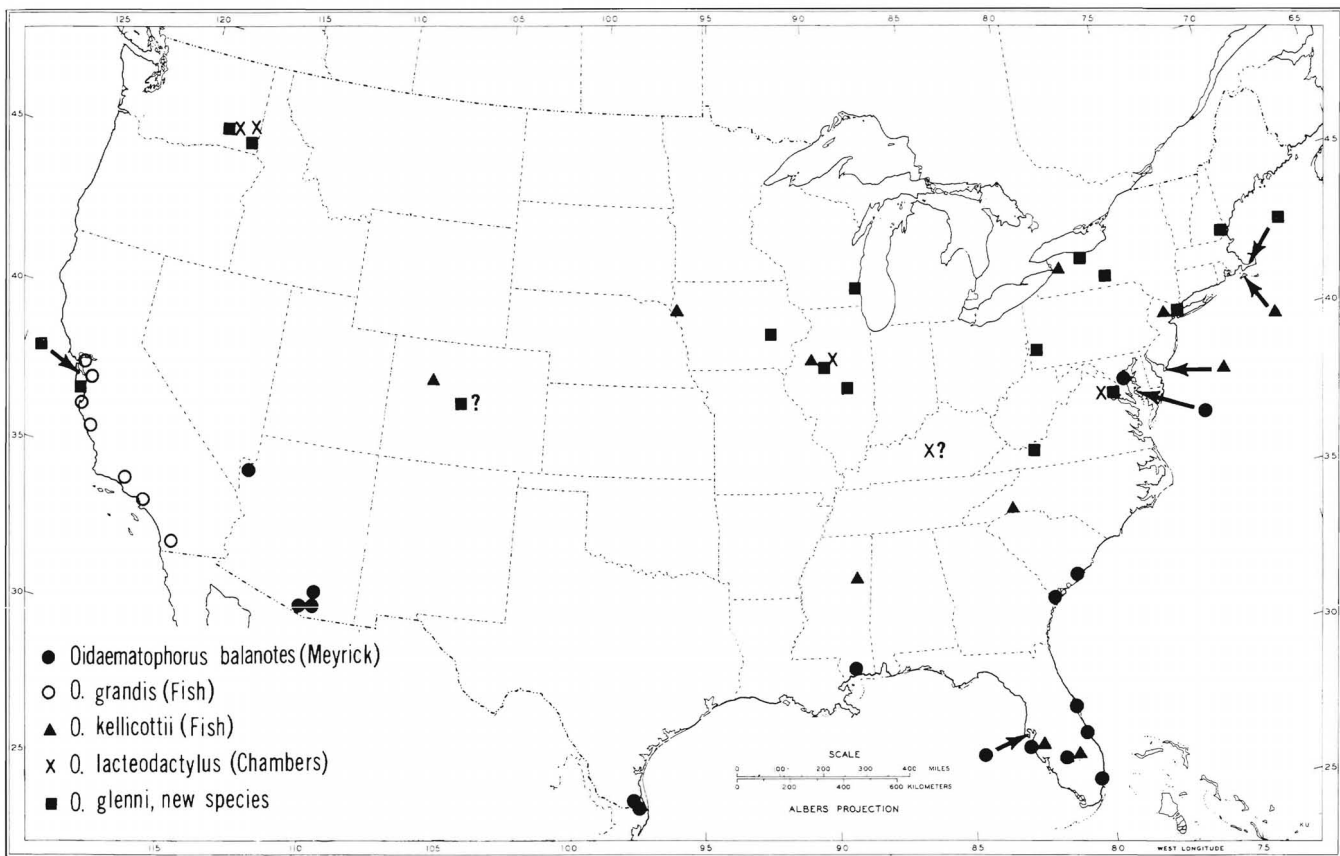
Type data: Holotype, male, Titusville, Florida, August, genitalia slide 10183, in collection of British Museum (Natural History); *P. aquila* Meyrick, holotype, female, Texas, in collection of British Museum (Natural History).

Food plant: Specimens in the U.S. National Museum Collection were reared from larvae which were boring in the stems of *Baccharis* sp. and *Myrica* sp.

Specimens examined (40 ♂♂, 38 ♀♀; Map 1): **UNITED STATES, ARIZONA:** Baboquivari Mtns., Pima Co., 1 ♀, Aug. 1–15, 1933, O. C. Poling (USNM); same locality, 4 ♀♀, Aug. 15–30, 1923, O. C. Poling (USNM); Madera Canyon, Santa Rita Mtns., 4880 ft., 2 ♂♂, Aug. 1–4, 1959, R. W. Hodges (USNM); Mohave Co., 2 ♂♂, Aug. 8–15 (USNM); Santa Catalina Mtns., Pinal Co., 2 ♂♂ Aug. 1–7 (USNM); same locality, 1 ♂, no date (USNM). **FLORIDA:** Archbold Biological Station, Lake Placid, 1 ♀, May 1–7, 1964, R. W. Hodges (USNM); Lauderdale, 1 ♀, Feb. 11, 1923, D. M. Bates (USNM); St. Petersburg, 1 ♂, Jan. 31, 1951, R. Ludwig (USNM); same locality, 2 ♂♂, April 24, 1914, R. Ludwig (USNM), same locality 1 ♂, Dec. 30, 1914, R. Ludwig (USNM); same locality, 1 ♀, Feb. 8–15 (USNM); same locality, 1 ♀, March 1–7 (USNM); same locality, 1 ♀, Oct. (USNM); same locality, 3 ♂♂, 3 ♀♀, no date (USNM); Siesta Key, Sarasota Co., 5 ♂♂, Jan. 17–20, 1951, C. P. Kimball (CPK); same locality, 1 ♀, June 6, 1957, C. P. Kimball (CPK); same locality, 1 ♀, Feb. 14, 1956, C. P. Kimball (CPK); Titusville, 1 ♂, Aug. (BMNH); Vero Beach, 1 ♂, Feb., 1914, J. R. Malloch (USNM). **MARYLAND:** Highway 50 at South River, 1 ♂, Aug. 19, 1939, stem borer ex. *Baccharis* sp., J. F. G. Clarke (USNM); Lloyds, Dorchester Co., 1 ♂, 1 ♀, July 10, 1907, H. S. Barber (USNM). **MISSISSIPPI:** Landon, 1 ♀, Aug. 7, 1921, Larva in *Myrica* sp., L. E. Miles (USNM). **SOUTH CAROLINA:** Bluffton 1 ♀, Oct. 14, 1887 (USNM); Charleston, 1 ♀, July 9, 1898 (USNM). **TEXAS:** Brownsville, 1 ♀, June, F. H. Snow (USNM); same locality, 2 ♀♀, July 11, G. Dorner (USNM); same locality, 1 ♂, 2 ♀♀, ex. marsh willow, lot #44-27928; same locality, 1 ♀, Nov. 14, 1928, F. H. Benjamin (USNM); same locality, 1 ♂, Nov. 18, 1927, F. H. Benjamin (USNM); same locality, 1 ♂, 3 ♀♀, Nov. 27, 1928, F. H. Benjamin (USNM); same locality, 6 ♂♂, 4 ♀♀, no date (USNM); San Benito, 3 ♂♂, 1 ♀, July 16–23 (USNM); same locality, 1 ♂, 2 ♀♀, Aug. (USNM); same locality, 2 ♂♂, Sept. 8–15 (USNM).

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Figs. 1–2. 1, Male genitalia of *Oidaematophorus balanotes* (Meyrick), ventral view, aedeagus removed; 2, male genitalia of *Oidaematophorus grandis* (Fish), ventral view, aedeagus removed. (Scales = 1 mm.)



Because of its larger size, this species is not often confused with other related species in the southeastern United States. A West Coast species, *O. grandis* (Fish), is nearly as large, but slight genitalic differences and its apparent restriction to western California are sufficient to separate the two species.

Wing maculation and the clasper of the male genitalia are extremely variable. Specimens from the same locality and collected on the same date may have all, a few, or none of the forewing vein tips marked with dark spots. The forewing cleft is typically marked with one or two dark spots, but the spots are absent on some specimens. The clasper of the left valva is usually more curved at the base than it is at the middle, but the curvature of the clasper is more variable in *O. balanotes* than in the other species studied. The clasper of the holotype is acutely curved near the middle but seems to be within the range of the species. The tip of the right valva is more acutely pointed than in the other related species studied.

Oidaematophorus grandis (Fish)

(Figures 2, 10; Map 1)

Lioptilus grandis Fish 1881: 141.

Alucita grandis, Fernald, in Smith 1891: 87.

Pterophorus grandis, Fernald 1898: 50.

Pterophorus baccharides Grinnell 1908: 317.

Oidaematophorus grandis, Barnes and Lindsey 1921: 430.

Alar expanse: 30–34 mm.

Head: Scale coloration and palpus as in *O. balanotes*.

Thorax: Scales brownish white. Forewing brownish white with faded dark spots at tips of veins; cleft spot pale or absent (photograph in Barnes and Lindsey 1921: Pl. XVII, Fig. 7). Hindwing pale brownish white to grayish white. Legs identical to those of *O. balanotes*.

Abdomen: Scale coloration as in *O. balanotes*.

Male genitalia (Fig. 2): Much like *O. balanotes* except clasper on left valva more acutely curved near base and right valva with a slight lobe near middle of hind margin.

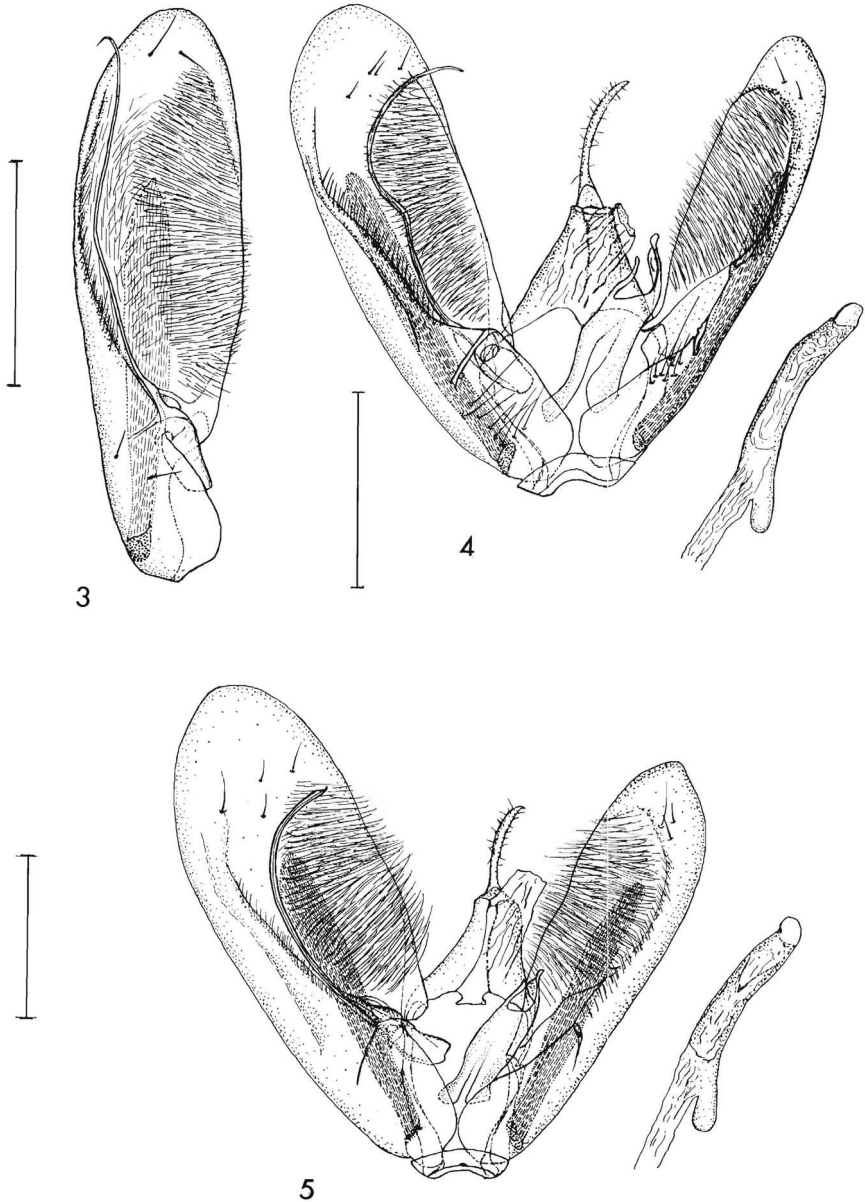
Female genitalia (Fig. 10): Identical to those of *O. balanotes* except anterior apophysis shorter and slightly thicker.

Type data: I hereby designate a male in the collection of the Museum of Comparative Zoology as lectotype, labeled: "California, 1782," genitalia slide EDC 258. Two paralectotypes (without abdomens), one male and one broken specimen, from California are in the collection of the U.S. National Museum. Grinnell's two syntypes of *P. baccharides* were not examined.

Food plant: The larvae bore in stems of *Baccharides pilularis* DC. Additional notes on the immature stages were recorded by F. X. Williams (in Barnes and Lindsey 1921: 431–432).

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Map 1. Distribution records for *Oidaematophorus* spp. It is important to note that these records perhaps indicate the distribution of *collectors* of *Oidaematophorus* rather than the actual distribution of the species.



Figs. 3-5. 3, Left valva of *Oidaematophorus kellicottii* (Fish), ventral view; 4, male genitalia of *Oidaematophorus lacteodactylus* (Chambers), ventral view, aedeagus removed; 5, male genitalia of *Oidaematophorus glenni* Cashatt, n. sp. ventral view, aedeagus removed. (Scales = 1 mm.)

Specimens examined (10 ♂♂, 2 ♀♀, Map 1): **UNITED STATES, California:** Berkeley, 1 ♂, June 10, 1931, Don Meadows; Carmen, 2 ♂♂, June, A. A. Vachell; Los Angeles Co., 1 ♂, May, C. V. Riley; Mills College, Alameda Co., 1 ♂, 1 ♀, June 27–30, 1908, G. R. Pilate; Monterey Co., 2 ♂♂, June 10, 1908, F. X. Williams; San Felipe Valley, San Diego Co., 1 ♀, Sept. 5, 1937, Don Meadows; Santa Clara, 2 ♂♂, no date; Wheeler Hot Springs, 1 ♂, July 29, 1943, (all USNM).

Barnes and Lindsey (1921: 432) noted that a specimen (female) of *O. grandis* labeled "Plummer's Island, Maryland, May" was probably an error either in their record or on the label. After dissecting the genitalia of this specimen, I find it to be *O. glenni* described below.

Notes on the genitalia will aid in separating this western species from *O. glenni* in California.

Oidaematophorus kellicottii (Fish)

(Figures 3, 11; Map 1)

Lioptilus kellicottii Fish 1881: 141.

Alucita kellicottii, Fernald, in Smith 1891: 87.

Pterophorus kellicottii, Fernald 1898: 49

Pterophorus kellicottii (sic), Meyrick 1910: 17.

Oidaematophorus kellicottii, Barnes and Lindsey 1921: 427.

Alar expanse: 20–28 mm.

Head: Scales light brownish white. Labial palpus slender and erect, but not reaching antennal base.

Thorax: Scales light brownish white. Forewing scales brownish white with an indistinct brownish dash extending from base and fading out toward cleft; usually a dark spot at base of cleft; tips of some or all veins marked with a small dark brown spot (photograph in Barnes and Lindsey 1921: Pl. XLVII, Fig. 5). Hindwing brownish white to pale brown. Legs identical to *O. balanotes*.

Abdomen: Scale coloration as in *O. balanotes*.

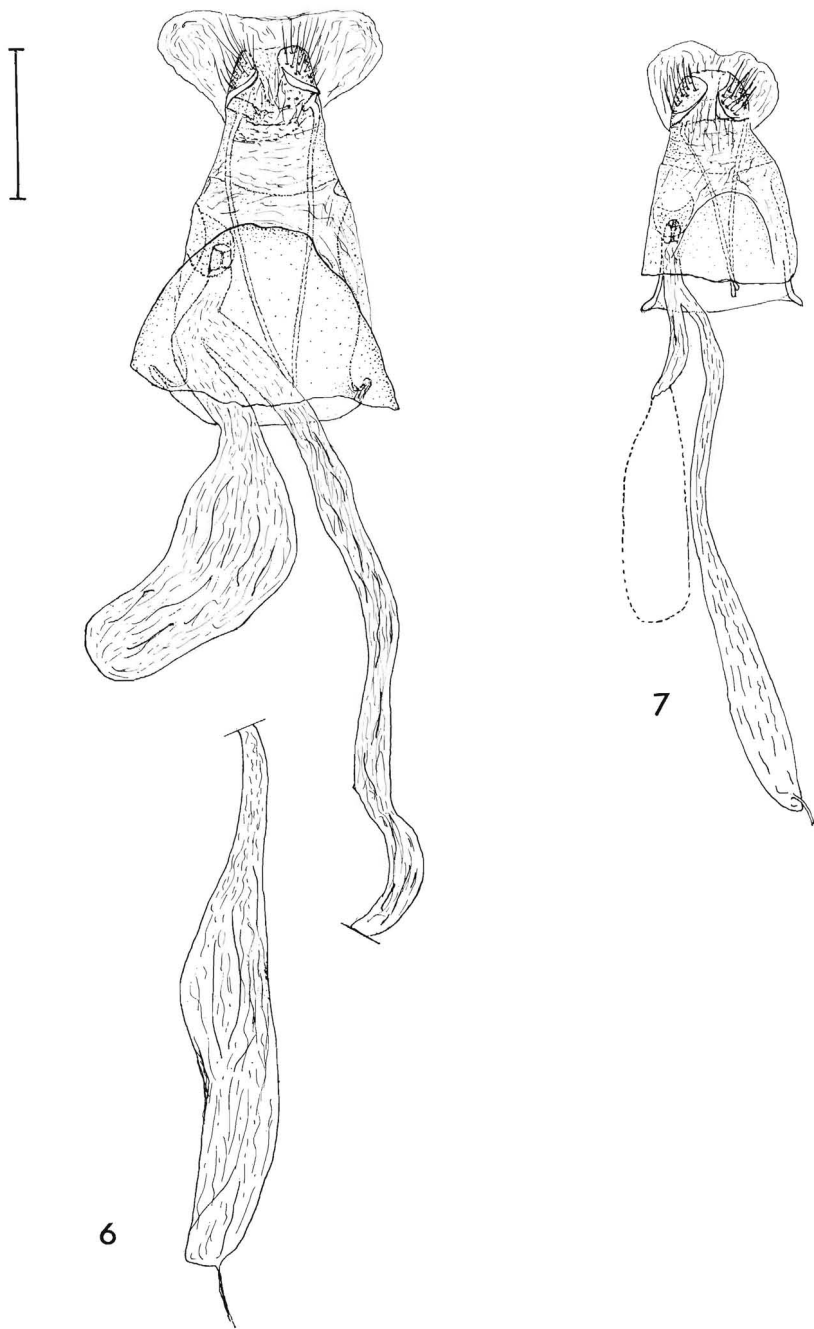
Male genitalia (Fig. 3): Similar to those of *O. balanotes* except smaller; tips of valvae more rounded; clasper slightly shorter and directed laterad or mediad, distal half straighter, curvature more acute near base and at tip.

Female genitalia (Fig. 11): Similar to those of *O. balanotes* except tergite VIII with anterior margin rounded; anterior apophysis straight and directed laterad.

Type data: Lectotype, male, without abdomen, and one female paralectotype, Buffalo, New York, no date, in U.S. National Museum.

Food plant: The larva bores into the stems of *Solidago*. The food habits were studied by Kellicott (in Barnes and Lindsey 1921: 429).

Specimens examined (10 ♂♂, 7 ♀♀; Map 1): **UNITED STATES, Colorado:** Glenwood Springs, 1 ♂, June 8, 1893, W. Barnes (USNM). **Florida:** Archbold Biological Station, Lake Placid, 1 ♂, June 1–8, 1964, R. W. Hodges (USNM); St. Petersburg, 1 ♀, May (USNM); Siesta Key, Sarasota Co., 1 ♂, Feb. 18, 1956, C. P. Kimball (USNM); same locality, 1 ♀, May 18, 1963, C. P. Kimball (CPK). **Illinois:** Putnam Co., 1 ♂, 2 ♀♀, July 7, 1961, M. O. Glenn (MOG); same locality, 1 ♂, July 16, 1960, M. O. Glenn (MOG). **Iowa:** Sioux City, 1 ♀, July 15, 1917, A. Lindsey (USNM). **Massachusetts:** Martha's Vineyard, 1 ♀, July 19, F. M. Jones (USNM). **Mississippi:** Agriculture College, 1 ♂, July 23, 1920, F. H. Benjamin (USNM). **New Jersey:** Anglesca, 1 ♂, May 28, 1905, W. D. Kearfott (USNM); Essex Co. Park, 1 ♂, Aug. 2, 1906, W. D. Kearfott (USNM); no data, 1 ♂, D. S. Kellicott (USNM). **New York:** no locality, 1 ♀, Oct. 16, 1880, Fernald Coll., labeled "type" (USNM). **North Caro-**



lima: Tryon, 1 ♀, June 2, 1904, Fiske (USNM); same locality, 1 ♂, Aug. 4, 1904, Fiske (USNM).

The genitalia of this species are nearer those of *O. balanotes* than those of the other species; the differences are described above. Specimens of *O. kellicottii* are generally smaller and have a single distinct spot at the base of the cleft.

Oidaematophorus lacteodactylus (Chambers)

(Figures 4, 7, 12; Map 1)

Pterophorus lacteodactylus Chambers 1873: 72.

Alucita subochracea Fernald, in Smith 1891: 87 (*in partim*).

Pterophorus subochraceus, Fernald 1898: 43 (*in partim*).

Oidaematophorus lacteodactylus, Barnes and Lindsey 1921: 426.

Alar expanse: 27–29 mm.

Head: Scale coloration and palpus as in *O. balanotes*.

Thorax: Scales brownish white. Forewing brownish white with diffuse light brown dash extending from base and fading near cleft; one or two indistinct brown spots at base of cleft; tips of some or all veins marked with dark brown (photograph in Barnes and Lindsey 1921: Pl. XLVII, Fig. 6). Hindwing brownish white. Legs identical to those of *O. balanotes*.

Abdomen: Scale coloration as in *O. balanotes*.

Male genitalia (Fig. 4): Similar to those of *O. kellicottii* except distal one-third of clasper more broadly curved and not as finely drawn, tip of right valva not sharply pointed.

Female genitalia (Figs. 7, 12): Similar to those of *O. kellicottii* except anterior apophysis shorter, anterior margin of tergite VIII only slightly rounded.

Type data: Holotype, male, Kentucky, no abdomen, in the collection of the Museum of Comparative Zoology.

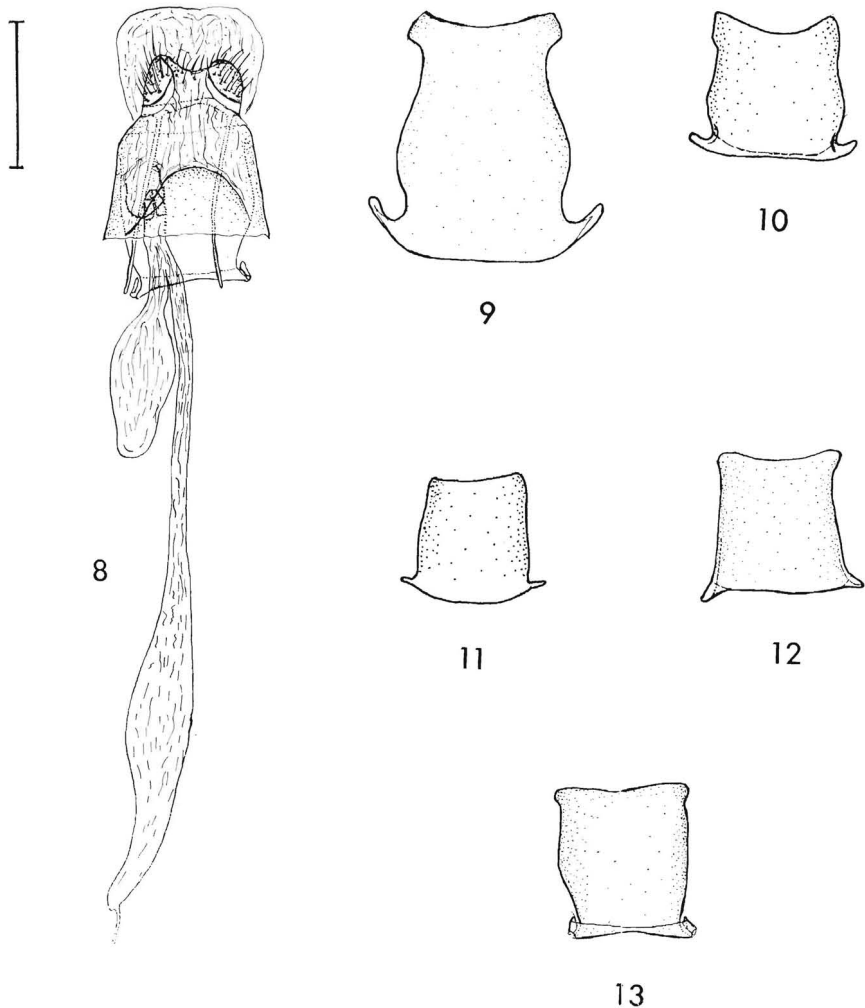
Food plant: Dr. J. F. G. Clarke reared specimens which were boring in stems of *Solidago* sp. in Washington.

Specimens examined (10 ♂♂, 4 ♀♀; Map 1): **UNITED STATES, Illinois:** Putnam Co., 2 ♀♀, July 8–11, M. O. Glenn (MOG). **Kentucky:** no further data, 1 ♂ (MCZ). **Maryland:** Plummer's Island, 1 ♂, July 1, 1903, A. Busck (USNM). **Washington:** Almota, 8 ♂♂, 2 ♀♀, May 2–26, reared from *Solidago* sp., J. F. G. Clarke (USNM); Pullman, 1 ♂, May 15, 1935, J. F. G. Clarke (USNM).

The identity of this species has been confusing. Barnes and Lindsey's illustration (1921: Pl. LIV, Fig. 2) of the male genitalia matches a slide labeled "*O. lacteodactylus*, 67551" in the U.S. National Museum Collection. Since the abdomen of the type specimen is lost, I am unable to compare the type's genitalia with those of the study material. Most specimens that I have examined have a slight outward bend near the middle of the clasper which is not shown in Barnes and Lindsey's figure. The length

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Figs. 6–7. 6, Female genitalia of *Oidaematophorus balanotes* (Meyrick), ventral view; 7, female genitalia of *Oidaematophorus lacteodactylus* (Chambers), ventral view. (Scale = 1 mm.)



Figs. 8-13. 8, Female genitalia of *Oidaematophorus glenni* Cashatt, n. sp., ventral view; 9-13, eighth abdominal tergite of female, dorsal view: 9, *Oidaematophorus balanotes* (Meyrick); 10, *Oidaematophorus grandis* (Fish); 11, *Oidaematophorus kellicottii* (Fish); 12, *Oidaematophorus lacteodactylus* (Chambers); 13, *Oidaematophorus glenni* Cashatt, n. sp. (Scale = 1 mm.)

and width of the valvae are highly variable, but the general shape and width of the clasper seem fairly constant.

McDunnough (1927) was unable to find Lindsey's slides or any specimens which resembled his illustration of the male genitalia. Therefore, he offered a new figure of the left valva (including the clasper) of a

species that he considered to be *O. lacteodactylus*. I have examined specimens whose genitalia are identical to McDunnough's figure, and I consider them to be new and distinct from *O. lacteodactylus*. This new species, *O. glenni*, is described below.

***Oidaematophorus glenni* Cashatt, new species**

(Figures 5, 8, 13; Map 1)

Oidaematophorus lacteodactylus: *auctorum nec* Chambers.

Alar expanse: 24–34 mm.

Head: Scale coloration identical to that of *O. balanotes*.

Thorax: Forewing brownish white with dark spot at base of cleft, or spot may be absent; ends of veins usually marked with dark or faded brown spots. Hindwing brownish white. Legs with scale coloration as in *O. balanotes*.

Abdomen: Scale coloration brownish white with indistinct pale brown longitudinal lines as in *O. balanotes*.

Male genitalia (Fig. 5): Similar to those of *O. balanotes* except clasper on left valva broadly curved, not attenuate, shorter and with tip flattened before terminating in a short, curved point.

Female genitalia (Figs. 8, 13): Similar to those of *O. balanotes* except anterior margin of tergite VIII with a narrow dorsal fold; anterior apophysis short and pointed, reinforced by lateral ends of dorsal fold.

Type data: Holotype, male, Putnam Co., Ill., June 12, 1953, M. O. Glenn, genitalia slide EDC 892; in the collection of the Illinois Natural History Survey. Paratypes (29 ♂♂, 21 ♀♀; Map 1): **California:** Big Trees, Santa Cruz Co., 1 ♂, July 19, 1921, Don Meadows, genitalia slide EDC 187 (USNM); Half Moon Bay, 1 ♀, June 14, 1937, W. H. Lange (USNM). **Colorado:** no locality, 2 ♀♀, Bruce, genitalia slides EDC 198, 272 (USNM). **Illinois:** Decatur, 1 ♂, no date, genitalia slide EDC 277 (USNM). All from Putnam Co.: 2 ♂♂, May 18, 1965, M. O. Glenn, genitalia slides EDC 894, 895 (MOG); 1 ♂, May 25, 1964, genitalia slide EDC 898 (MOG); 1 ♂, June 5, 1956, reared from larva in roots of *Solidago canadensis*, 11675 (USNM); 1 ♂, June 7, 1956, reared from larva in roots of *Solidago canadensis*, 11757, genitalia slide 190 (USNM); 1 ♂, June 9, 1955, larva reared on goldenrod (root borer), 11557, genitalia slide 191 (USNM); 1 ♂, June 9, 1956, larva reared from roots of *Solidago canadensis*, 11457, genitalia slide EDC 891 (MOG), 1 ♀, June 9, 1963, genitalia slide EDC 897 (MOG); 1 ♂, June 14, 1956 larva in roots of *Solidago canadensis*, genitalia slide EDC 900 (MOG); 1 ♀, June 14, 1967 (MOG); 1 ♂, June 16, 1956, larva in roots of *Solidago canadensis*, genitalia slide EDC 893 (MOG); 1 ♀, June 19, 1958, reared from larva boring in roots of goldenrod (MOG). **Iowa:** Homestead, 1 ♂, May 30, genitalia slide 72-448 (USNM). **Maryland:** All from Plummer's Island: 1 ♀, May 1, 1906, Aug. Busck, genitalia slide EDC 195; 1 ♂, June 5, W. V. Warner, genitalia slide EDC 204; 1 ♀, no date, Aug. Busck, genitalia slide EDC 197 (All USNM). **Massachusetts:** Barnstable, 1 ♂, June 20, 1954, C. P. Kimball, genitalia slide EDC 292 (CPK). **New Hampshire:** Hampton, 1 ♂, June 3, 1906, S. A. Shaw, genitalia slide 265 (USNM). **New Jersey:** Essex Co. Park, 1 ♂, June 24, trap, W. D. Kearfott, genitalia slide 72-447 (USNM). **New York:** Monroe Co., 1 ♂, June 10, 1947, C. P. Kimball, genitalia slide EDC 289 (CPK); same locality and collector, 1 ♂, June 27, 1948, genitalia slide EDC 291 (CPK); Newfield, 1 ♂, May 27, 1960, R. W. Hodges, genitalia slide EDC 906 (USNM); Six Mile Creek, Ithaca, 2 ♂♂, May 29, 1959, R. W. Hodges, genitalia slides EDC 905, 909 (USNM). **Pennsylvania:** Pittsburgh, 1 ♂, May 30, 1905, Henry Engel, genitalia slide EDC 203 (USNM). **Virginia:** Montgomery Co., 1 ♀, May 27, 1898, genitalia slide EDC 207 (USNM). **Washington:** All from Almta, reared from *Solidago* stalks by J. F. G. Clarke: 1 ♀, Jan. 3, 1935, genitalia

slide JFGC 396; 1 ♀, March 18, 1934, genitalia slide EDC 209; 1 ♂, March 21, 1934, genitalia slide EDC 178; 1 ♂, April 9, 1934, genitalia slide JFGC 397; 1 ♀, April 10, 1934, genitalia slide JFGC 394; 1 ♀, April 23, 1934, genitalia slide EDC 183; 1 ♂, May 3, 1935, genitalia slide EDC 181; 1 ♀, May 5, 1935, genitalia slide 391; 1 ♀, May 9, 1934, genitalia slide EDC 202; 1 ♀, May 13, 1935, genitalia slide JFGC 393; Wawawai, 2 ♂ ♂, 3 ♀ ♀, Jan. 9, 1935 reared from *Solidago* stalks, J. F. G. Clarke, genitalia slides EDC 179, 180, 182, 184 JFGC 395; same data 1 ♀, Jan. 10, 1935, genitalia slide 200 (All USNM). Wisconsin: Milwaukee Co., 2 ♂ ♂, March 3, 1923, F. P. Breakey, genitalia slides EDC 267, W. H. Lange 520.

Food plant: Dr. J. F. G. Clarke reared larvae which were boring in the stalks of *Solidago* sp. in Washington. Mr. Murray O. Glenn of Illinois collected and reared larvae from the roots of *Solidago canadensis* L.

I take great pleasure in naming this species after Mr. Murray O. Glenn, Henry, Illinois, who through many years of collecting has contributed much toward our knowledge of Lepidoptera in Illinois.

This species was considered to be *O. lacteodactylus* by McDunnough (1927). After examining genitalia slides which match the illustration of that species (Barnes and Lindsey 1921), I am convinced this species is distinct and separate from *O. lacteodactylus* and *O. keliccottii*. The clasper of the male genitalia of *O. glenni* has a flattened tip with a small oblique barb whereas the claspers of *O. lacteodactylus* and *O. keliccottii* have a finely drawn tip.

In addition to the localities listed in the type series, McDunnough (1927) reports the species to be widely distributed in Canada (Alberta, Manitoba, Ontario, Saskatchewan).

ACKNOWLEDGMENTS

I wish to thank Dr. R. W. Hodges of the Systematic Entomology Laboratory, U.S. Department of Agriculture, and Dr. W. D. Duckworth, U.S. National Museum (USNM), for their guidance; Dr. L. D. Miller, Allyn Museum of Entomology, for reviewing the manuscript; Dr. P. J. Darlington, Museum of Comparative Zoology (MCZ), and Mr. Paul Whalley, British Museum (Natural History) (BMNH) for their cooperation concerning type specimens, Messrs. M. O. Glenn (MOG), Henry, Illinois, and C. P. Kimball (CPK), Sarasota, Florida, for loaning their specimens (The letters in parentheses are used in the text to refer to the location of specimens examined).

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ANNOTATED LIST OF THE BUTTERFLIES OF INDIANA, 1971

ERNEST M. SHULL
North Manchester, Indiana

and

F. SIDNEY BADGER
Woodland Hills, California

The entomologists at Purdue University, while having adequate funds available, necessarily concentrate their efforts and research on the insects considered agricultural pests. They are, however, building a world-wide collection of butterflies. At Indiana University funding for entomology is scarce and spent largely on teaching efforts. Thus the field of Rhopalocera has been wide open and challenging for the serious collector in Indiana, as was appreciated by the authors who received much encouragement and help from members of the Lepidopterists' Society. Although Indiana has had two major annotated state lists of Rhopalocera (Blatchley, 1891 and Montgomery, 1931), and more recently a list of the butterflies of Perry County (Masters and Masters, 1969), nearly forty years have passed without the publication of a comprehensive state-wide list of the butterflies (Papilionoidea) and skippers (Hesperioidea).

The State of Indiana, customarily considered a flat agricultural area, in reality combines a number of different and interesting zoogeographic regions with natural habitats for a diversified flora and fauna. In short