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NOTES AND NEW SPECIES OF MICROLEPIDOPTERA
FROM WASHINGTON STATE

By J. F. GATES CLARKE

IN 1933, under the above title, I started a series of papers in which I proposed to deal with the microlepidopterous fauna of the State of Washington. Three of these papers have been published.¹ This paper, the fourth, contains descriptions of nine new species and one new genus, as well as notes on other miscellaneous species. In addition, four European species are recorded as new to North America.

The drawings for this paper were made by Arthur D. Cushman, staff artist, Bureau of Entomology and Plant Quarantine.

Family GELECHIIDAE

ANACAMPSIS POPULELLA (Clerck)

Phalaena populella CLERCK, *Icones Insectorum*, pl. 11, fig. 5, 1760.

E. I. Smith, Bureau of Entomology and Plant Quarantine, Seattle, Wash., submitted a series of this species for determination. Accompanying the moths was a series of larvae and pupae. The larvae were collected on a species of *Salix* and the moths were reared from them.

This appears to be the first record of the occurrence of this European species in North America. All specimens are in the United States National Museum.

¹ Can. Ent., vol. 65, pp. 84-93, 1933. Can. Ent., vol. 66, pp. 171-181, 1934. Can. Ent., vol. 67, pp. 244-254, 1935.

GNORIMOSCHEMA ARNICELLA, new species

PLATE 29, FIGURES 6, 6a; PLATE 32, FIGURE 14

Antenna sordid white annulated with blackish fuscous. Labial palpus sordid white shaded with gray on inner side of second segment, and irrorated with fuscous outwardly. Head, thorax, and fore wing pale cinereous, lightly shaded with pale brown and profusely, but finely, irrorated with fuscous. On the wing there are five blackish-fuscous spots, one at base of wing just inside costa, one on inner margin slightly farther out, one at one-third between 1b and the cell, another between the bases of 9 and 10, and a larger lunate spot at end of cell; cilia ochreous white strongly irrorated with blackish fuscous. Hind wing light gray, darker apically; cilia pale yellowish fuscous. Legs pale cinereous irrorated with fuscous. Abdomen cinereous, paler beneath.

Male genitalia.—Upper arm of harpe almost straight, nearly as long as uncus and tegumen combined; lower arm short, stout. Anterior process of vinculum about as long as lower arm of harpe. Gnathos a rather weak hook. Uncus well developed, rounded. Aedeagus stout, moderately dilated basally, distally with a dorsal protuberance.

Female genitalia.—Genital plate broad; ostium heart-shaped. Bursa copulatrix pear-shaped with a strong, slightly curved signum. Ductus bursae short, broad, with a narrow sclerotized ring before the ostium; inception of ductus seminalis at anterior edge of the sclerotized ring.

Alar expanse, 14–15 mm.

Type.—U.S.N.M. No. 56268.

Type locality.—Kamiack Butte, Whitman County, Wash., 3,000 feet.

Food plant.—*Arnica cordifolia* Hook.

Remarks.—Described from the type female (19–V–34, J. F. G. Clarke No. 5668); one female paratype, Newman Lake, Spokane County, Wash. (July 1915, G. K. Jennings); and one male paratype, Shasta Retreat, Siskiyou County, Calif. (August 16–23).

One paratype is in the Carnegie Museum, Pittsburgh, Pa.; the other paratype is in the United States National Museum.

The larva of this species is a leaf roller on the food plant.

LITA PRINCEPS (Busck), new combination

Gnorimoschema princeps BUSCK, Proc. Ent. Soc. Washington, vol. 11, p. 175, 1909.

The type of this species is in the United States National Museum. Although it is in poor condition, consisting of a fore and a hind wing, head without palpi, and two legs, it is easily recognizable as being a member of the genus *Lita* Treitschke. Vein 2 of the forewing is remote from 3, a character that distinguishes *Lita* from *Gnorimoschema* Busck.

In addition to the type, I have before me a series of eight specimens from Washington and Utah as follows: Washington: Pullman (23-IX-1925, J. F. G. Clarke); Wenatchee, 5 ♂ ♂ (23-29-VIII-1929, A. Spuler). Utah: Eureka, ♂ (27-VIII-1911) and Stockton, ♂ (29-VIII-1904), both collected by Tom Spalding.

The venation of the Washington and Utah specimens agrees with the type, and the genitalia definitely place these specimens in *Lita*.

In his paper on the restriction of the genus *Gelechia*² Busck retained this species in the genus *Gnorimoschema*. He undoubtedly did this, despite the obviousness of the venation, because of the inadequacy of the material before him.

ARLA, new genus

This genus is similar to *Lita* but differs from it in the extremely long antenna (thickened in the male), the long scaling from the uncus, the armed aedeagus, and the single weak signum.

Genotype.—*Arla tenuicornis*, new species.

ARLA TENUICORNIS, new species

PLATE 30, FIGURE 9; PLATE 31, FIGURES 10-10b; PLATE 32, FIGURE 13

Antenna fuscous faintly annulated with gray. Labial palpus ochreous white strongly overlaid and irrorated with fuscous. Head luteous. Thorax and fore wing luteous profusely irrorated with fuscous, the surface of the wing appearing dull light brown. On the wing are three more or less well-defined fuscous spots, one between 1b and the cell before one-third, another at the base of vein 10, and the third at the end of the cell; cilia pale yellowish fuscous irrorated with fuscous. Hind wing fuscous; cilia pale yellowish fuscous. Legs ochreous white irrorated and overlaid with fuscous. Abdomen light fuscous above; ochreous white, irrorated with fuscous, beneath.

Male genitalia.—Upper arm of harpe very long, slender, dilated distally; lower arm long, slender, acutely pointed. Gnathos strong, sickle-shaped, with a prominent posterobasal protuberance. Uncus large, dilated posteriorly and edged with long scales. Vinculum with a well-developed, bifurcate posterior process with serrate edges and a long, bluntly pointed anterior process. Aedeagus long, slender, thickened and strongly armed at middle, and with a distolateral thorn.

Female genitalia.—Ostium broad, funnel-shaped. Bursa copulatrix rather small, oval; signum a weakly sclerotized plate. Ductus bursae long; posterior third sclerotized; inception of ductus seminalis slightly posterior to middle of ductus bursae.

Alar expanse, 17-23 mm.

² Busck, A., Proc. U. S. Nat. Mus., vol. 86, p. 571, 1939.

Type.—U.S.N.M. No. 56269.

Type locality.—Warwick, Klickitat County, Wash.

Food plant.—Unknown.

Remarks.—Described from the type male (9-VI-1931, T. M. Clarke) and five male and five female paratypes as follows: Shelton, Mason County, Wash., 1 ♂ (20-VI-1931, J. F. G. Clarke No. 2700); Shasta Retreat, Siskiyou County, Calif., 4 ♂♂, 5 ♀♀ (June 16-23, July 1-7).

CHIONODES LOETAE, new species

PLATE 30, FIGURES 8-8b; PLATE 31, FIGURE 12

Antenna blackish fuscous with faint ochreous-white annulations. Labial palpus ochreous white, more ochreous in brush, strongly irrorated with blackish fuscous outwardly and on third segment. Face and head pale gray brown. Thorax and fore wing rich chocolate brown with a purple iridescence (in some specimens the ground color is somewhat paler); apical fourth of wing almost solid blackish fuscous; in the cell three blackish-fuscous spots in a line; on vein 1b, at basal third, another similar spot (in most specimens the spots are pronounced but in some examples they are only faintly indicated); cilia pale fuscous with strong blackish-fuscous irrorations. Hind wing fuscous, cilia somewhat lighter. Legs ochreous white but the ground color almost obliterated by a strong blackish-fuscous suffusion.

Male genitalia.—Upper arm of harpe long, slender, acutely pointed; lower arm very weak, slender, small. Gnathos a long, evenly curved hook. Uncus rather large. Aedeagus stout with short stalk; distal end strongly sclerotized.

Female genitalia.—Ostium large, opening from the strongly sclerotized posterior portion of the ductus bursae; ductus bursae with only a short, membranous, anterior section. Bursa copulatrix large, pear-shaped, with the ductus seminalis opening into the posterior end; signum a strongly sclerotized, scobinate plate.

Alar expanse, 17-22 mm.

Type.—U.S.N.M. No. 56270.

Type locality.—Friday Harbor, San Juan County, Wash.

Food plant.—Unknown.

Remarks.—Described from the type male (16-VII-1926, T. C. Kincaid); three male and two female paratypes as follows: Bellingham (14-VIII-1930, J. F. G. Clarke No. 2943), ♂; Seattle (VI-27-1901, O. B. Johnson ?), ♂; (British Columbia; no date or collector), ♂; Bonneville, Clark County (16-VIII-1931, J. F. G. Clarke No. 2685), ♀; "British Columbia" (7-VIII-1905; no specific locality or collector), ♀. Paratypes in the United States National Museum.

CHIONODES WHITMANELLA, new species

PLATE 30, FIGURES 7-7b

Antennae dull ochreous white with narrow fuscous annulations. Labial palpus sordid white lightly irrorated with fuscous. Face and head sordid white with a suffusion of pale brown. Thorax and fore wing light yellowish brown. Thorax infuscated. Fore wing, especially toward tip, infuscated; in cell, about middle, two blackish-fuscous spots, one before the other; on vein 1b, slightly before basal third, a similar spot; cilia pale yellowish fuscous. Hind wing pale fuscous white, cilia pale yellowish fuscous. Legs ochreous white suffused and irrorated with fuscous. Abdomen pale brown suffused with fuscous beneath.

Male genitalia.—Upper arm of harpe slender, strongly curved, acutely pointed, reaching slightly beyond midpoint of tegumen; lower arm straight, slender, weak, somewhat shorter than upper arm. Gnathos very long, stout, curved. Uncus small. Vinculum with well-developed anterior process. Aedeagus long, slender, with a long stalk.

Alar expanse, 17-19 mm.

Type.—U.S.N.M. No. 56271.

Type locality.—Pullman, Wash.

Food plant.—Unknown.

Remarks.—Described from the type male (23-IX-1932, J. F. G. Clarke No. 4962) and two male paratypes as follows: (same data as type), ♂; Wenatchee, ♂ (12-IX-1929, A. Spuler).

In habitus *whitmanella* closely resembles species of the genus *Iso-phrictis* Meyrick.

FILATIMA ROCELIELLA, new species

PLATE 28, FIGURES 2, 2a

Antenna dark fuscous. Labial palpus sordid white; second segment suffused outwardly on basal part with fuscous and darkly shaded with dark ochreous in the brush; third segment lightly shaded with fuscous. Face, head, thorax, and fore wing sordid white. Head shaded with sordid yellow above. Base of tegula and fore wing strongly suffused with dark fuscous. Fore wing with a distinct, median, longitudinal fuscous streak suffused and irrorated with light ochreous; for almost the entire length of wing, along the veins, especially vein 12, are longitudinal ochreous streaks; cilia sordid white lightly irrorated with blackish fuscous. Hind wing pale fuscous; cilia yellowish, fading to white apically. Legs white irrorated and suffused with blackish fuscous. Abdomen yellowish above, white beneath.

Male genitalia.—Upper arm of harpe weak, slender, dilated distally; lower arm slightly curved, bluntly pointed. Gnathos a small, weak,

serrate hook. Aedeagus with one large and several small lateral projections.

Alar expanse, 17 mm.

Type.—U.S.N.M. No. 56272.

Type locality.—Quincy, Grant County, Wash.

Food plant.—Unknown.

Remarks.—Described from the unique type (13-IV-1930, J. F. G. Clarke).

This species cannot be confused with any other described North American species because of its distinctive character. It belongs in the group of *Filatima* having the curtain scaling from the underside of the costa of the hind wing.

FILATIMA ALBICOSTELLA, new species

PLATE 27, FIGURES 1-1b

Antenna fuscous. Labial palpus white; second segment, except upper inner edge, completely suffused with dark fuscous; third segment strongly overlaid with dark fuscous. Head and face shining whitish, the former irrorated and the latter strongly suffused with fuscous. Thorax blackish fuscous with a purple luster. Fore wing yellowish white strongly suffused and irrorated with fuscous except costal edge and with a purplish luster; in cell, on basal half of wing, a few ill-defined, blackish-fuscous streaks; cilia dirty white irrorated with blackish fuscous. Hind wing light purplish fuscous, darker toward margins; cilia pale fuscous. Legs white heavily overlaid with blackish fuscous. Abdomen fuscous above, white suffused with fuscous beneath.

Male genitalia.—Upper arm of harpe weak; lower arm longer than the upper, strong, with undulating ventral edge. Vinculum broad, excavated on posterior edge. Gnathos slightly curved, compressed distally. Aedeagus with a long, straight, divergent projection laterally.

Alar expanse, 18-19 mm.

Type.—U.S.N.M. No. 56273.

Type locality.—Pullman, Wash.

Food plant.—Unknown.

Remarks.—Described from the type male (21-II-1935) and two male paratypes (15-III-1933, 11-V-1925), all collected by the author. Paratypes in the United States National Museum.

This species belongs in the group of *Filatima*, which lacks the curtain scaling from the underside of the costa of the hind wing.

FILATIMA CUSHMANI, new species

PLATE 28, FIGURES 3-3c

Antenna fuscous with narrow gray annulations. Labial palpus grayish buff irrorated and suffused with blackish fuscous. Face buff; head pale grayish buff, the scales narrowly edged with fuscous. Thorax and fore wing grayish buff with a bronzy iridescence in some lights; from costa, near base, an ill-defined, outwardly oblique, broken blackish-fuscous line; from costa at basal fifth another similar ill-defined line to center of cell, thence longitudinally to the end of cell; at apical third, on costa, a faint indication of a blackish-fuscous spot; on costal fold, from base to basal third, a fine, broken, ochreous, longitudinal line; in cell, two distinct, dull-yellowish spots, with ochreous and black scales mixed; at basal third, on vein 1b, a similar spot; cilia pale yellowish gray, irrorated with blackish fuscous. Hind wing light grayish fuscous; cilia light yellowish fuscous. Legs ochreous white suffused and irrorated with blackish fuscous. Abdomen light yellowish fuscous above, ochreous white irrorated with blackish fuscous beneath.

Male genitalia.—Upper arm of harpe sharply bent ventrad and with a sharp ventral projection between the bend and base; lower arm rather short, fleshy, hairy. Gnathos a sharply bent, stout hook. Vinculum narrowed ventrally and with a well-developed anterior process. Aedeagus with an unusually large ventrolateral, flat, flared, toothed process on each side and a stout, moderately long, toothed dorsal process; base large and bulbous.

Alar expanse, 18–22 mm.

Type.—U.S.N.M. No. 56274.

Type locality.—Pullman, Wash.

Food plant.—Unknown.

Remarks.—Described from the type male (24–VII–1933, J. F. G. Clarke No. 4947) and two male paratypes as follows: 1, Yakima, Wash. (23–VII–1931, Fred P. Dean); 1, Johnson's Bar, Snake River, Idaho (10–IV–1926, J. F. G. Clarke No. 3190). Paratypes in the United States National Museum.

This species belongs in the group of *Filatima* without curtain scaling from the underside of the costa of the hind wing.

I take pleasure in naming this species for Arthur D. Cushman, who made the illustrations for this paper.

AROGA WEBSTERI, new species

PLATE 29, FIGURES 5-5c; PLATE 32, FIGURE 15

Antenna fuscous with lighter, narrow annulations. Labial palpus sordid white with irrorations and base of second segment fuscous.

Head and face sordid white, the former strongly suffused with gray above. Thorax and fore wing with sordid white ground color almost obliterated by grayish-fuscous suffusion and overlying grayish-fuscous scales; extreme base and two or three short, ill-defined, oblique costal dashes blackish fuscous; on lower fold, nearly to middle of wing, a blackish-fuscous longitudinal dash with a few ochreous scales mixed; in the cell at middle, a shorter dash followed by an ill-defined small spot of the same color; cilia sordid whitish suffused with gray and irrorated with blackish-fuscous. Hind wing light smoky fuscous; cilia light fuscous tipped with sordid white and with a distinct dirty-yellowish basal band. Legs whitish suffused and irrorated with blackish fuscous. Abdomen grayish fuscous above, sordid white suffused and irrorated with blackish fuscous beneath.

Male genitalia.—Terminal points of harpe as long as thickened basal portion. Posterior processes of vinculum long, slender, and acutely pointed. Uncus dilated and compressed posteriorly. Aedeagus curved in distal third, with a slender, curved lateral arm for attachment of vesica.

Female genitalia.—Ostium protruding, rounded. Signum weak, two of the four points poorly developed.

Alar expanse, 14–16 mm.

Type.—U.S.N.M. No. 56275.

Type locality.—Pullman, Wash.

Food plant.—Unknown.

Remarks.—Described from the type male (18–VII–1930), 1 ♂ (5–VIII–1932), and 4 ♀♀ (27–VII to 4–VIII–1932) paratypes from the type locality, all collected by the author. Type and paratypes in the United States National Museum.

The genitalia of this species most closely resemble those of *Aroga rigidae* (Clarke).

This species is named in honor of my friend and former professor, Dr. R. L. Webster, head of the department of zoology, Washington State College.

Family OECOPHORIDAE

BATIA LUNARIS (Haworth)

Recurvaria lunaris HAWORTH, Lepidoptera Britannica, pt. 4, p. 556, 1829.

In the course of making identifications of moths associated with studies on the Dutch elm disease, the apparent similarity between English specimens of *Batia lunaris* (Haworth) and a series of two males and three females from the State of Washington was noted. Further investigation and a comparison of the male genitalia of these with the English specimens and other European material proved them to be identical.

The Washington specimens were collected at Bonneville and Vancouver, Clark County, from June 26 to July 7, 1931, by the author.

This is the first record of the occurrence of this species in North America although probably it has been in the vicinity of Vancouver since the early settlement of the English on the Columbia River.

Family GLYPHIPTERYGIDAE

ANTHOPHILA PARIANA (Clerck)

Phalaena Tortrix pariana CLERCK, Icones Insectorum, pl. 10, fig. 9, 1759.

Among material submitted for determination by C. F. Doucette, Sumner, Wash., was a large series of *Anthophila pariana* (Clerck). This species was formerly placed in the genus *Hemerophila*. The first record of its occurrence in North America was published by E. P. Felt³ under the title "Apple and Thorn Skeletonizer." In that paper the insect was listed from several localities in New York State. In the United States National Museum there are specimens from Connecticut, Rhode Island, New Jersey, and New York, but those received from Mr. Doucette from Washington represent the first known record of the occurrence of *A. pariana* in the western part of the United States.

Family HYPONOMEUTIDAE

ZELLERIA PYRI, new species

PLATE 28, FIGURES 4-4b; PLATE 31, FIGURE 11

Antenna blackish fuscous with narrow, sordid-white annulations. Labial palpus white, dusted with blackish fuscous exteriorly; tip of third segment ochreous white. Face white sparsely dusted with fuscous. Head ochreous white. Thorax white, heavily overlaid with lustrous black scales; tegulae with a reddish luster. Fore wing light brown variously marked with black and white; costa, from about basal third almost to apex, broadly margined by white dusted with black; on costa and inner margin, slightly beyond basal third, a black spot (in some specimens these spots are obliterated by their confluence with other black-margined scales); base of wing narrowly black; over veins 3 and 4, at their bases, a more or less distinct, short black dash; cilia fuscous, darker at apex. Hind wing shining dark grayish fuscous; cilia fuscous. Legs white, irrorated and overlaid with blackish fuscous. Abdomen fuscous above; white, irrorated with blackish fuscous, beneath.

Male genitalia.—Harpe ample, simple, broadest slightly beyond middle; cucullus broadly rounded. Anellus a simple broad band.

³ Jour. Econ. Ent., vol. 10, p. 502, 1917.

Vinculum with a long, narrow dorsoanterior process. Aedeagus long, slender, slightly wider apically than basally, bluntly pointed. Gnathos with a central tonguelike projection with a rough posterior surface. Socii long, digitate, sharply pointed.

Female genitalia.—Genital plate broad, strongly sclerotized, posterior edge concave. Ostium small, round. Bursa copulatrix large, oval, without signum. Ductus bursae membranous except for a thickened, sclerotized section in the posterior half; inception of ductus seminalis midway between the posterior end of this sclerotized part and the ostium.

Alar expanse, 12–16 mm.

Type.—U.S.N.M. No. 56276.

Type locality.—Puyallup, Wash.

Food plant.—*Pyrus* sp.

Remarks.—Described from the type male, 4 male and 8 female paratypes, all from the type locality (21–VI to 4–VII–1933, P. M. Eide).

This species is closely similar in pattern to *Zelleria parnassiae* Braun.

SWAMMERDAMIA PYRELLA (Villers)

Tinea pyrella VILLERS, Caroli Linnaei Entomologia, Faunae Suecicae descriptionibus aucta, vol. 2, p. 515, 1789.

In the course of making identifications of moths from Washington State, the study of the genitalia of a pair of Microlepidoptera from Bellingham proved them to be the European *Swammerdamia pyrella* (Villers), not previously recorded from North America. These moths were collected August 13, 1932, by the author.

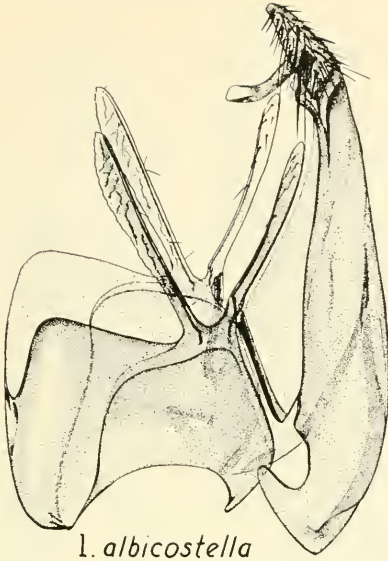
The larva feeds on the leaves of apple and prune.

Family ERIOCRANIIDAE

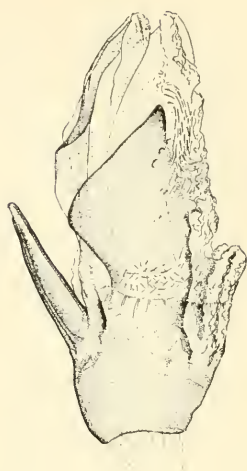
ERIOCRANIA SEMIPURPURELLA (Stephens)

Lampronia semipurpurella STEPHENS, Illustrations of British Entomology, Haustellata, vol. 4, p. 359, 1835.

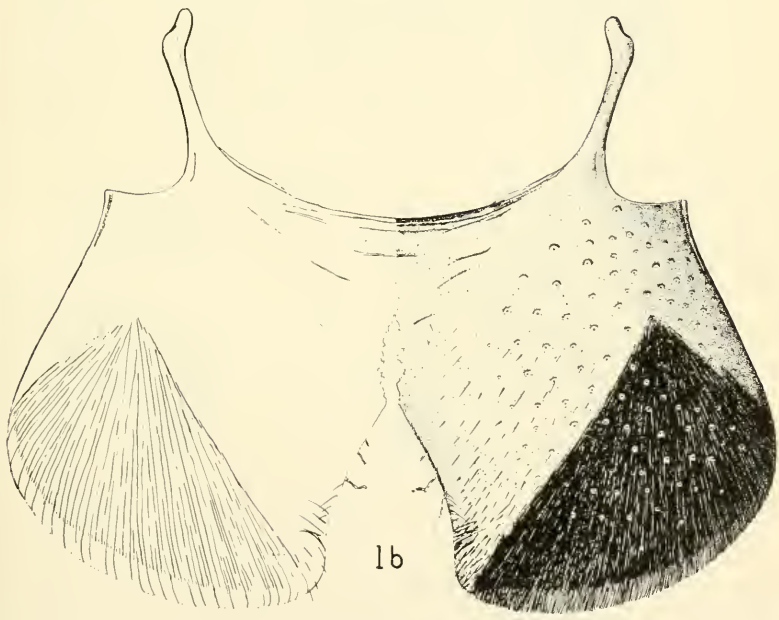
Before me is a series of four moths of this species collected at Bellingham (3–8–IV–1923, J. F. G. Clarke No. 3709–12) at light. Although these were collected many years ago, it has become possible to identify them only recently and to record the presence of this European species in North America for the first time. When the above specimens were collected, the species was abundant at light. I have not seen it since.



1. *albicostella*



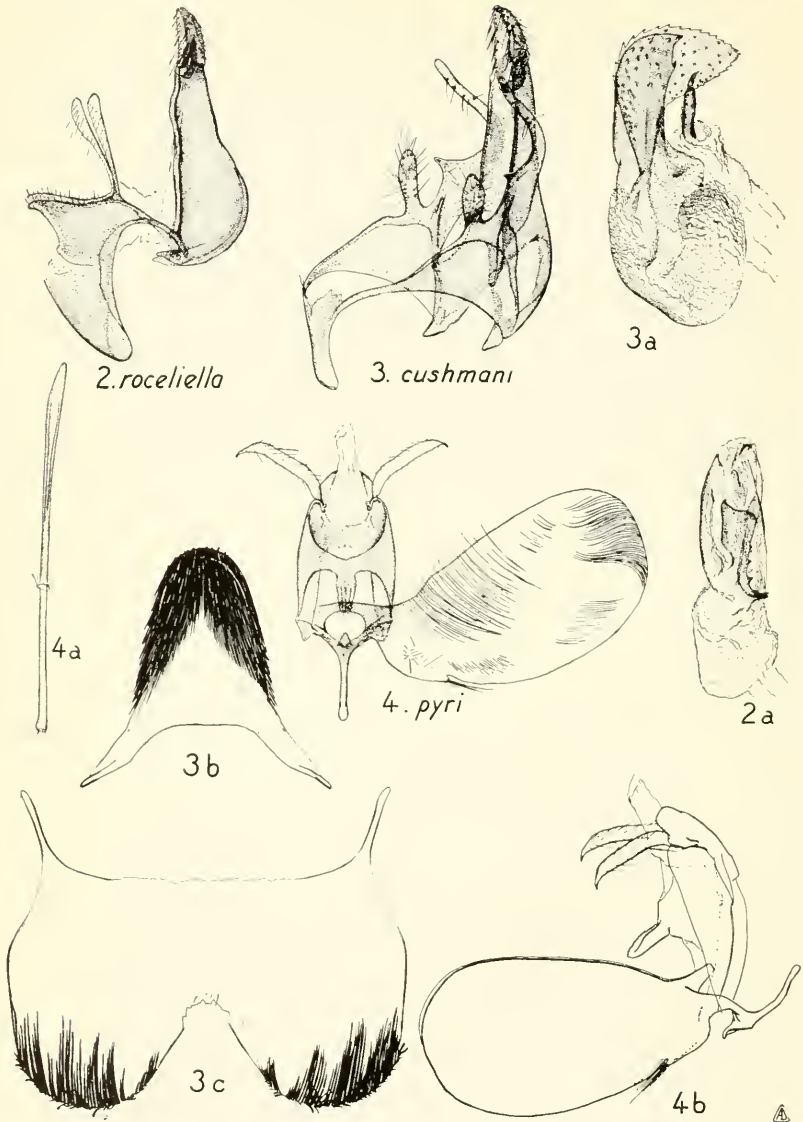
1a



1b



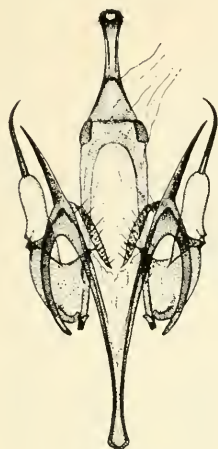
Filatima albicostella, new species: 1, Lateral view of male genitalia with aedeagus removed; 1a, lateral view of aedeagus; 1b, eighth sternite of male.



2, 2a. *Filatima roceliella*, new species: 2. Lateral view of male genitalia with aedeagus removed; 2a, lateral view of aedeagus.

3-3c. *Filatima cushmani*, new species: 3. Lateral view of male genitalia with aedeagus removed; 3a, lateral view of aedeagus; 3b, eighth tergite of male; 3c, eighth sternite of male.

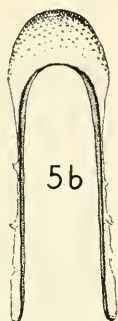
4-4b. *Zelleria pyri*, new species: 4, Ventral aspect of male genitalia with left harpe and aedeagus removed; 4a, lateral view of aedeagus; 4b, lateral view of male genitalia with aedeagus removed.

5. *websteri*

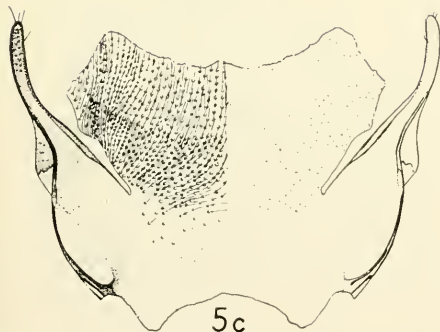
5a



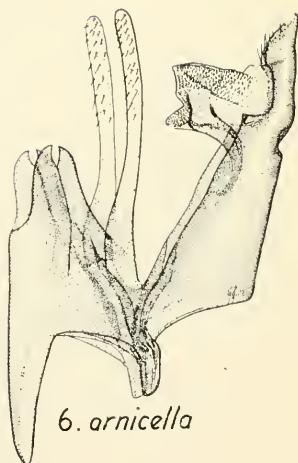
6a



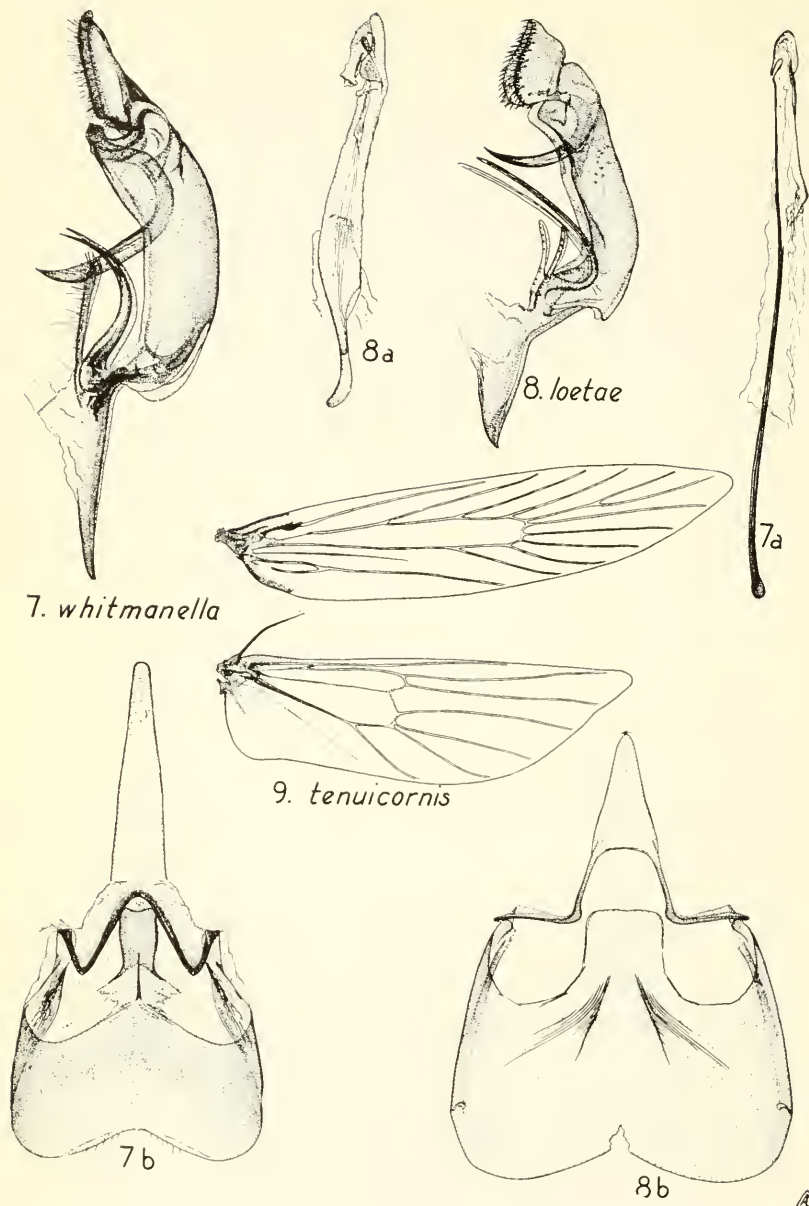
5b



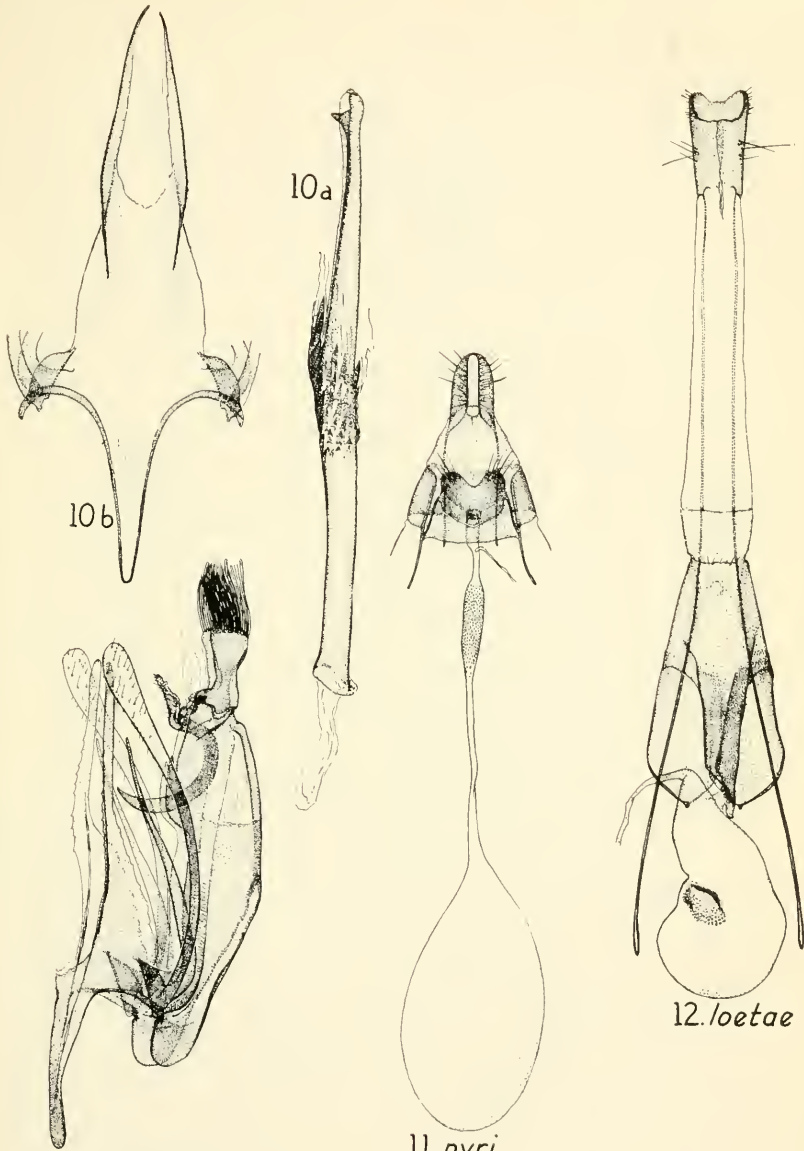
5c

6. *arnicella*

5-5c. *Aroga websteri*, new species: 5, Ventral view of male genitalia with aedeagus removed; 5a, lateral view of aedeagus; 5b, eighth tergite of male; 5c, eighth sternite of male.
6, 6a. *Gnorimoschema arnicella*, new species: 6, Lateral view of male genitalia with aedeagus removed; 6a, lateral view of aedeagus.



- 7-7b. *Chionodes whitmanella*, new species: 7, Lateral view of male genitalia with aedeagus removed; 7a, lateral view of aedeagus; 7b, eighth tergite and sternite of male, articulated.
- 8-8b. *Chionodes loetae*, new species: 8, Lateral view of male genitalia with aedeagus removed; 8a, lateral view of aedeagus; 8b, eighth tergite and sternite of male, articulated.
9. *Arla tenuicornis*, new species: Wing venation.



10. *tenuicornis*

11. *pyri*

12. *loetae*

10-10b. *Arla tenuicornis*, new species: 10, Lateral view of male genitalia with aedeagus removed; 10a, aedeagus, lateral view; 10b, ventral view of vinculum.

11. *Zelleria pyri*, new species: Ventral view of female genitalia.

12. *Chionodes loetae*, new species: Ventral view of female genitalia.



13. *tenuicornis*



14 *arnicella*



15. *websteri*

13. *Arla tenuicornis*, new species: Ventral view of female genitalia.
14. *Gnorimoschema arnicella*, new species: Ventral view of female genitalia.
15. *Aroga websteri*, new species: Ventral view of female genitalia.

