

**North American Crambinae: Notes on the Tribe Chiloini
and a Revision of the Genera *Eoreuma* Ely and *Xubida* Schaus
(Lepidoptera: Pyralidae)**

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Abstract: The tribe Chiloini of the pyralid subfamily Crambinae is characterized and its North American genera and species listed. The North American species of the chiloine genera *Eoreuma* Ely and *Xubida* Schaus are characterized and discussed, and their male genitalia figured. The following new species are named: *Eoreuma evae* (Arizona), ***confederata*** (Texas), ***callista*** (New Mexico), and ***crawfordi*** (Iowa); and *Xubida relovae* (Florida) and ***lipan*** (Texas). A **neotype** is designated for *Spermatophthora multilineatella* Hulst, here placed in *Xubida*.

The writer is preparing a monograph of the North American Crambinae which, however, cannot be ready for publication for at least a year. It is desirable that in the meantime names be available for a number of undescribed species, for the benefit of other workers in the field who are studying the tropical Crambinae. Furthermore, the status of the tribe Chiloini and of the two genera treated here need clarification.

TRIBE CHILOINI

Until relatively recently the wing venation has been used as the chief generic criterion in the Crambinae. A number of genera have been more or less set apart on the basis of having vein R_5 (forewing) arising from the end of the discal cell, instead of being stalked with R_{3+4} as in most other genera. This character is, indeed, valid for most of the presently recognized Chiloini, but not for all. For example, Barnes & McDunnough named *Crambus chiloidellus* in the genus *Crambus* Fabricius because it has R_5 short-stalked on R_{3+4} , but in all other ways it is unmistakably a member of the Chiloini. Dyar named *Platytes vobisne* in the genus *Platytes* Guenée, which he considered (mistakenly) to be in the group of genera we now consider chiloine, because it has R_5 arising from the cell; but in all other ways this species is crambine and not chiloine.

Acknowledgment is made of the cooperation of every museum and major collection in North America and of the British Museum (Natural History) in lending material for study. Many individuals, too, have been most helpful, especially Andre Blanchard, Stanislaw Bleszynski, Mont Cazier, Clifford Crawford, Douglas Ferguson, Willis Gertsch, E. C. Heinrichs, J. R. Heitzman, Charles Kimball, Bryant Mather, and Ellis Matheny.

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In addition the genera *Argyria* Hübner and *Urola* Walker in North America (and others in the tropical regions) have R_5 from the cell, but are so distinctive in genitalia, palpi and other features that they stand apart from both the Crambini and the Chiloini. The Chiloini may be briefly characterized as follows:

Head with frons rounded to conical and tuberculate. Forewing with vein R_5 almost always from discal cell below R_{3+4} . Ocelli and chaetosomata sometimes absent. Labial palpi almost always three or more times the head length. Male genitalia with juxta usually well developed, often with long, sclerotized, paired, caudolateral extensions; pseudosaccus often absent, if present not long and tubular; saccus of valva little developed, without strong, sclerotized processes; valvae without groups of greatly enlarged setae. Female genitalia with papillae anales strong, not bilobed, strongly compressed, each supported by a transverse, sclerotized, dorsoventral bar at posterior end of the apophysis posterior; apophyses posteriores well developed, sometimes very long, often partly strongly flattened and expanded; apophyses anteriores well developed and strong. Pattern of forewing most frequently with longitudinal streaks between, and sometimes along veins; transverse markings often vestigial or absent, when present usually consisting of rows of spots along median-postmedian (m-pm) and submarginal (sm) lines. Larvae often borers in soft, monocotyledonous stems.

As delimited here the Chiloini are a worldwide group with a considerable representation in the Holarctic region, but with far more tropical genera and species. In North America nearly all of the species are limited to the southern parts and belong to genera more abundantly represented and more widely distributed in the tropics. Very few occur as far northward as southern Canada and only one, *Acigona comptulatalis* (Hulst) has a boreal distribution, occurring only in southern Canada and the northern United States.

GENERIC CLASSIFICATION, *Chiloini*

The chiloine generic classification is quite confused, having for long been based on such externally visible characters as venation, palpi, ocelli and shape of the frons which we now know to be largely unreliable for tribal and generic classification, although they may be valuable in species-level taxonomy. Hampson (1896) made the first detailed classification of the world genera, using chiefly venation. Forbes (1923 and 1926) did about as well as possible without studying the genitalia. Dyar and Heinrich (1927) studied the genitalia but published on only a part of the group, omitting the genera with veins R_1 anastomosing or fusing with Sc, and R_5 stalked with R_{3+4} . In recent years Bleszynski has made a very detailed study of the world fauna, publishing a large number of articles, in the course of which his ideas of the generic classification have altered greatly, chiefly in the direction of temporary generic lumping. There is thus no "standard" classification based on a worldwide study. The present author feels that no useful purpose will be served by proliferating genera based on a limited faunal study, especially when the Neotropical region

is still comparatively unknown. The following listing shows his ideas about the taxonomy of the North American chiloine fauna, using generic names already available.

EPINA Walker, 1866, type species *Epina dichromella* Walker, 1866. 1. *dichromella* Walker. 2. *alleni* (Fernald) 1888.

CHILO Zincken, 1817, type species *Tinea phragmitella* Hübner, 1805. 1. *plejadellus* Zincken, 1821. 2. *erianthalis* Capps, 1963. 3. *idalis* (Fernald) 1896.

THOPEUTIS Hübner, 1818, type species *Thopeutis respersalis* Hübner, 1818. 1. *forbesellus* (Fernald) 1896.

ACIGONA Hübner, 1825, type species *Tinea cicatricella* Hübner, 1824. 1. *comptulatalis* (Hulst) 1886.

DIATRAEA Guilding, 1832, type species *Phalaena saccharalis* Fabricius, 1794. 1. *saccharalis* (Fabricius). 2. *crambidoides* (Grote) 1880. 3. *venosalis* Dyar, 1917. 4. *evanescens* Dyar, 1917. 5. *grandiosella* Dyar, 1911. 6. *lineolata* (Walker) 1856. 7. *lisetta* (Dyar) 1909.

HAIMBACHIA Dyar, 1909, type species *Crambus placidellus* Haimbach, 1907. 1. *squamulella* (Zeller) 1818. 2. *arizonensis* Capps, 1965. 3. *pallescens* Capps, 1965. 4. *indistinctalis* Capps, 1965. 5. *discalis* Dyar & Heinrich, 1927. 6. *floridalis* Capps, 1965. 7. *albescens* Capps, 1965. 8. *placidella* (Haimbach). 9. *cochisensis* Capps, 1965. 10. *diminutalis* Capps, 1965.

EOREUMA Ely, 1910, type species *Chilo densellus* Zeller, 1881. 1. *densella* (Zeller). 2. *loftini* (Dyar) 1917. 3. *evae*, n. sp. 4. *confederata*, n. sp. 5. *multipunctella* (Kearfott) 1908. 6. *callista*, n. sp. 7. *crawfordi*, n. sp.

XUBIDA Schaus, 1927, type species *Xubida dentilineella* Schaus, 1922. 1. *linearella* (Zeller) 1863. 2. *panalope* (Dyar) 1917. 3. *relovae*, n. sp. 4. *punctilineella* (Barnes & McDunnough) 1913. 5. *lipan*, n. sp. 6. *dentilineatella* (Barnes & McDunnough) 1913. 7. *puritella* (Kearfott) 1908. 8. *chiloidella* (Barnes & McDunnough) 1913.

HEMIPLATYTES Barnes & Benjamin, 1924, type species *Diatraea epia* Dyar, 1912. 1. *epia* (Dyar). 2. *prosenes* (Dyar) 1912. 3. *parallela* (Kearfott) 1908.

EUFERNALDIA Hulst, 1900, type species *Eufernaldia argentinervella* Hulst, 1900. 1. *cadarella* (Druce) 1896.

The generic name *Platytes* Guenée was used for so many Chiloini by Hampson, Dyar, Barnes & McDunnough and Forbes that its absence here requires comment. Its type species is the Palaearctic *Tinea cerussella* Denis & Schiff-

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EXPLANATION OF FIGURES

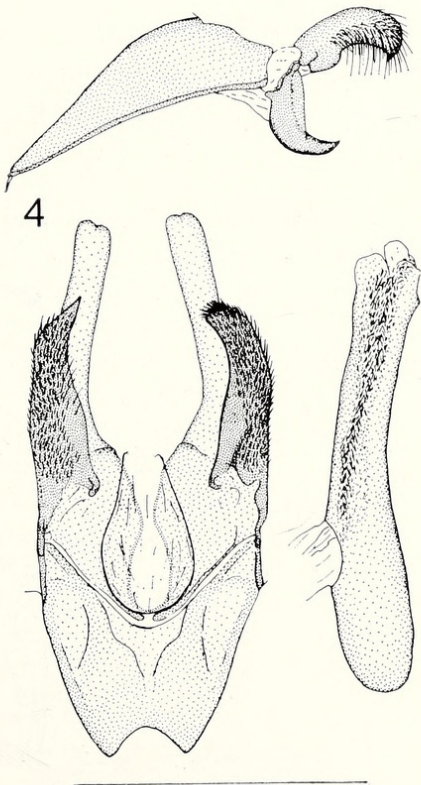
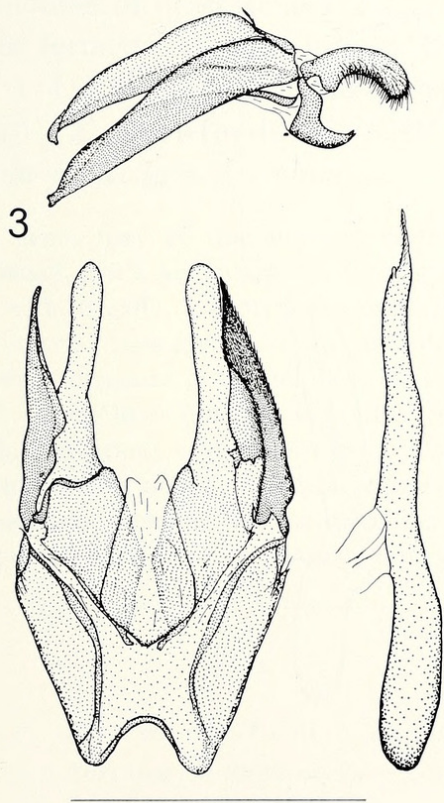
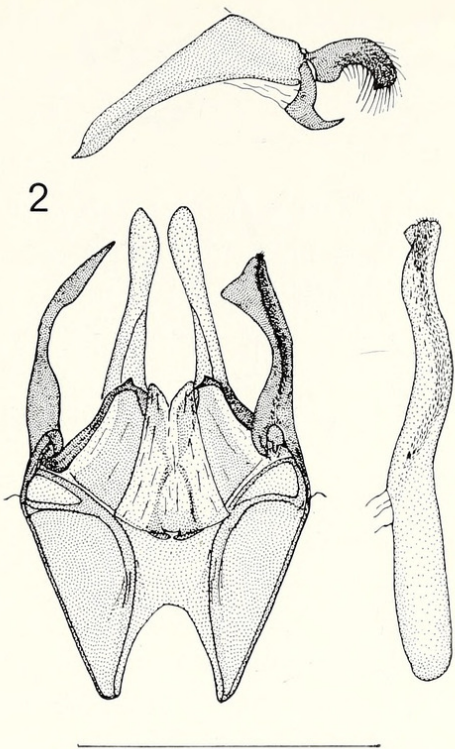
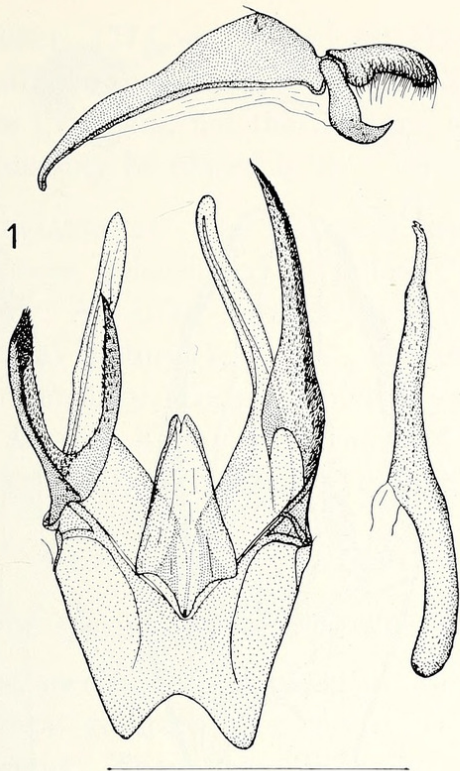
The uncus, gnathos, tegumen and aedoeagus are shown in lateral aspect, the vinculum, juxta and valvae in dorsal view, the valvae somewhat spread laterad. The scale lines represent 1 mm. on the specimen.

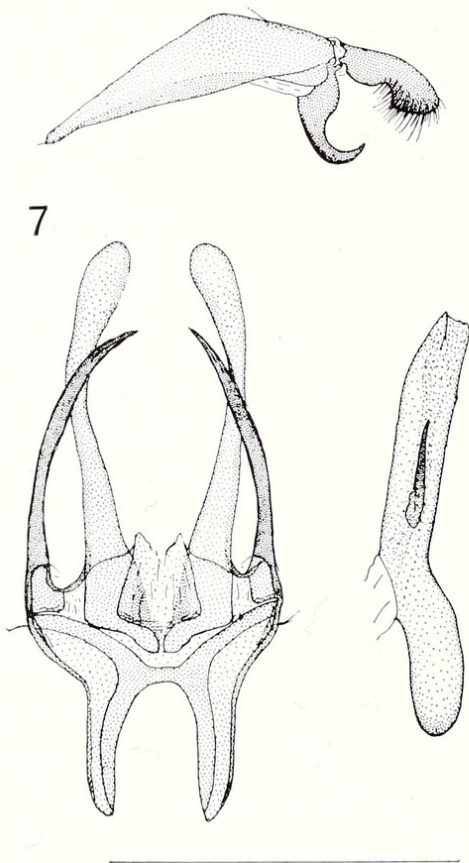
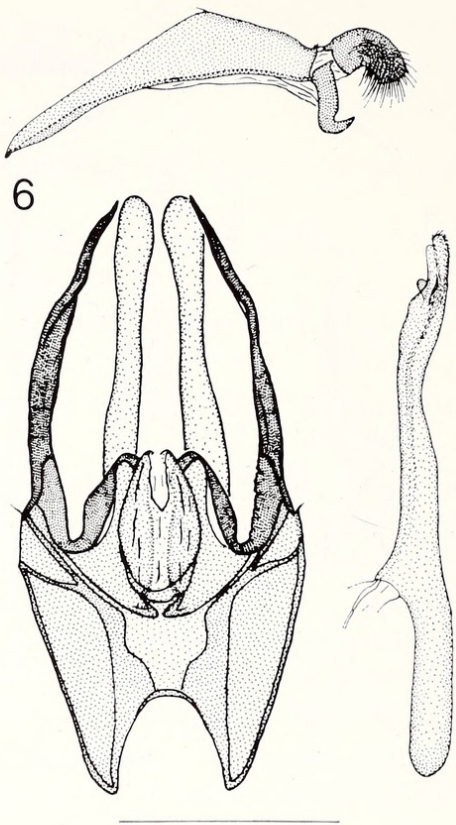
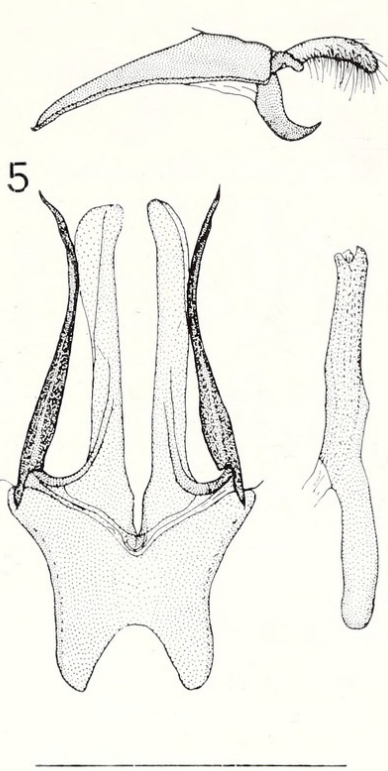
FIG. 1. *Eoreuma densella* (Zeller), Key Largo, Florida.

FIG. 2. *Eoreuma loftini* (Dyar), Mesa, Arizona.

FIG. 3. *Eoreuma evae*, n. sp., holotype, Madera Canyon, Santa Rita Mts., Arizona.

FIG. 4. *Eoreuma confederata*, n. sp., holotype, Limpia Canyon, Jeff Davis Co., Texas.





fermüller, 1775, designated by Hampson, 1896, p. 947. Examination of the genitalia and venation of *P. cerusellus* shows that it is unmistakably a member of the Crambini, not the Chiloini, and that no known North American species can possibly be placed in it.

ABBREVIATIONS: The names of institutions in which type material is located have been abbreviated as follows: A.M.N.H., American Museum of Natural History; A.S.U.T., Arizona State University, Tempe; B.M., (British Museum [Natural History]); C.N.C., Canadian National Collection; C.U., Department of Entomology, Cornell University; I.S.U., Iowa State University; L.A.C.M., Los Angeles County Museum; N.M.W., Naturhistorisches Museum, Wien; U.S.N.M., U. S. National Museum.

EOREUMA Ely, 1910, Proc. Ent. Soc. Washington, **12**:204

Type species: *Chilo densellus* Zeller, 1881, by monotypy.

The species here included in *Eoreuma* form, on the whole, what looks like a natural grouping, but this depends on what characters one considers more important. They agree in having the uncus and gnathos characteristically strongly opposingly curved and the areas along the veins of the forewings white; while the species placed in *Xubida* have the uncus and gnathos flattened, long and almost straight and the veins marked with dark lines. Both types of uncus and gnathos are found in *Diatraea*, *sensu lato*, while the *Eoreuma* type occurs in a number of other genera, e.g., *Haimbachia*. On the other hand the *Eoreuma* species form two distinct groups, if judged by the characters of the valvae (cf. Figs. 1-4 & 5-7); and in this respect (but not in uncus-gnathos structure and pattern) *E. crawfordi*, *multipunctella* and *callista* could be grouped with *Xubida puritella* and *chiloidella*.

The genus may be characterized as follows: uncus more or less cylindrical or somewhat compressed, with an enlarged, transverse basal portion, curving strongly ventrad, distally blunt with, usually, a ventral subterminal tooth; gnathos similarly short and heavily sclerotized, tapering strongly to a sharp, usually bifid, point, curved strongly dorsad; tegumen with long, thin, diagonal pedunculi that have their caudal margins bent strongly mesad; juxta a simple, troughlike support beneath aedoeagus, not heavily sclerotized, without paired, caudolateral arms; costal processes of valvae long and strongly sclerotized; no more than one (sometimes none) subbasal process of valva; frons rounded or conical; ocelli and chaetosomata present; pattern with veins white and darker intervenous areas containing longitudinal dark lines or shades; transverse markings vestigial or absent.

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FIG. 5. *Eoreuma crawfordi*, n. sp., holotype, Ames, Iowa.

FIG. 6. *Eoreuma multipunctella* (Kearfott), Huachuca Mts., Arizona.

FIG. 7. *Eoreuma callista*, n. sp., paratype, Laguna, New Mexico.

KEY TO NORTH AMERICAN *Eoreuma* BY EXTERNAL CHARACTERS

1. Frons conical 2
Frons rounded 3
2. General color of forewing brown; usually a small dark discal dot; intervenous spaces brownish, usually with few darker scales but sometimes with darker brown scales margining whitish areas along veins; California and Arizona; 9.6–11.4 mm. *E. loftini*
General color of forewing grayer; seldom more than a trace of a discal dot; intervenous spaces tending more to be edged with fuscous scales margining whitish areas along veins; southern Arizona; 9.8 mm. (very small male)—15.4 mm. (very large female) *E. multipunctella*
3. Markings of forewing contrasting and clear-cut; veins broadly satiny white; intervenous spaces clear, light yellow, marked only by single rows of blackish scales forming almost complete lines margining each white venous area; no dark discal dot, each discocellular vein white like other veins; southern New Mexico & Arizona; 8.9–9.1 mm. *E. callista*, n. sp.
Markings more diffuse; veins more narrowly white or whitish; intervenous spaces diffusely brownish; if markings are relatively clear-cut and contrasting (*E. densella*, dark specimens) then with a prominent dark discal dot 4
4. Forewing with terminal line, if present, very weak, but a series of distinct terminal dots in cells R_5 – Cu_{1b} ; R_2 stalked on R_{3+4} (vide infra); markings, especially of dark specimens, relatively clear-cut, with veins distinctly white and discal dot sharp and black; Massachusetts and North Dakota to Florida and Texas; 5.9 mm. (minute male)—11.4 mm. (very large female) *E. densella*
Forewing with a thin, dark terminal line, only very rarely with faint terminal dots; R_2 from cell; markings relatively diffuse, veins not contrastingly lighter; discal dot, if present, diffuse, not contrasting 5
5. Forewing with apex acuminate; discal dot definite, although diffuse; Iowa & Manitoba; 8.1–8.3 mm. (two males) *E. crawfordi*, n. sp.
Forewing with more normal, blunter apex; no discal dot 6
6. General color of forewing pale, slightly olivaceous gray; subcostal edge broadly pale, almost unmarked in area of radial branches; intervenous areas with many separate, contrastingly dark scales mostly forming lines outlining white venous areas; western Texas; 11.9 mm. (one male) *E. confederata*, n. sp.
General color of forewing distinctly brownish; subcostal edge with distinct brown lines outlining intervenous spaces; intervenous dark areas with few, if any, distinct and separate dark scales; southern Arizona; 10.0 mm. (one male) *E. evae*, n. sp.

KEY TO NORTH AMERICAN *Eoreuma* BY MALE GENITALIA

1. Costal processes of valvae thick, asymmetrical, at least partly densely spiculate 2
Costal processes of valvae long and thin, symmetrical, with no densely spiculate areas 5
2. Dextral costal process deeply bifurcate, sinistral one simple *E. densella*
Both costal processes simple 3
3. Both costal processes with densely spiculate areas *E. confederata*, n. sp.
Only the sinistral costal process with dense spiculation 4
4. Sinistral costal process terminally truncate with a meso-ventrad pointing lobe *E. loftini*
Sinistral costal process tapering to a simple, sharp point *E. evae*, n. sp.
5. Vinculum very deeply emarginate cephaloventrally; aedoeagus with a strong cornutus *E. callista*, n. sp.
Vinculum more shallowly emarginate cephaloventrally; aedoeagus with no cornuti 6

6. Valva with a rounded, setose lobe near ventral margin, from which a thin, sclerotized keel projects dorsad; costal processes weakly sinuate, extending little, if any, caudad of ends of cuculli; aedoeagus with a pair of small, projecting lobes terminally; a spheroid corematal structure middorsally at caudal edge of segment three of abdomen *E. multipunctella*
- Valva with no ventral lobe; costal processes evenly curved laterad, caudally exceeding ends of cuculli; aedoeagus with no projecting terminal lobes; no corematal structures on segment three of abdomen *E. crawfordi*, n. sp.

Eoreuma densella (Zeller)

Fig. 1

Chilo densellus Zeller, 1881, Horae Ent. Soc. Rossicae, **16**: 158, pl. 11, fig. 2.

E. densella is widespread, often relatively common southward, but scarcer or more local northward. Northern specimens average paler and more lightly marked than southern ones. In dark specimens the narrow, white discal streaks running distad from the discal cell in cell M_1 and along the fold are often very distinctly white and edged with black scales that contrast with the dark brown scales forming the other dark markings. The asymmetry of the costal processes of the valvae is constant, but there is considerable variation in the relative lengths of the two arms of the dextral one. The plain, more ventral process is usually shorter than the setose, more dorsal one, but occasionally is the longer. No correlation has been found between such variations and geographic distribution. Vein R_2 is stalked on R_{3+4} in all of the 132 specimens studied except in seven of 12 abnormally large males from near Sarasota, Florida in which it arises from the cell well basad of the base of R_{3+4} .

TYPE MATERIAL. Type ♂, Texas (in B.M.).

GEOGRAPHIC DISTRIBUTION. Connecticut, Florida, Georgia, Illinois, Iowa, Massachusetts, Michigan, Mississippi, New York, North Carolina, North Dakota, Tennessee, Texas.

Eoreuma loftini (Dyar)

Fig. 2

Chilo loftini Dyar, 1917, Insecutor Inscitiae Menstruus, **5**: 85.

Chilo opinionellus Dyar, 1917, *Ibid.*, **5**: 84.

These two nominal species were described by Dyar from single specimens of different sexes reared from different foodplants. However, study of additional specimens shows that they are almost certainly conspecific.

TYPE MATERIAL. *loftini*, type ♀, No. 21128, Glendale, Arizona, 1 Sept. 1914, bred from "Mexican cane," U. C. Loftin (in U.S.N.M.); *opinionellus*, type ♂, No. 21180, Yuma, Arizona, 24 July 1916, bred from larva in wheat stem, T. D. Urbahns (in U.S.N.M.).

GEOGRAPHIC DISTRIBUTION. Southern Arizona, southern California; probably Mexico: Sinaloa, Yucatan.

Eoreuma evae, n. sp.

Fig. 3

Forewing length, 10 mm. Frons bulging but rounded. Head and thorax pale brownish white, slightly mottled with darker brownish. Forewing ground color pale brownish white, intervenous spaces mostly darker, pale brownish with a sparse sprinkling of slightly darker brown scales along their edges, and a slightly heavier concentration of dark scales along the fold; intervenous spaces somewhat darker and more completely dark shaded in area between discal cell and costal margin. No dark discal dot. A dark terminal line on both forewings and hind wings; hind wings slightly paler than forewings.

MALE GENITALIA. Uncus and gnathos normal for the genus. Mesad-folded part of tegumen broad and heavily sclerotized. Vinculum deeply emarginate ventrocephally. Costal processes of valva large, heavily sclerotized, asymmetrical, the sinistral one sharply acute with a heavily spiculate area from base to tip, the dextral one about equal in length, very sparsely setose. Ventro-mesal process of valva very small, scarcely protruding. Juxta large but lightly sclerotized. Aedoeagus long and thin, longer than vinculum + valva, slightly sinuate, tapering caudad, with a very small, rounded, dorso-sinistral lobe at tip; vesica with no cornuti, with very sparse, very minute spicules in a small area.

Although only a single specimen is known, *E. evae* is clearly a distinct species by the male genitalia, since in the group to which it belongs these structures show constant differences between species and very little individual variation. It is named appreciatively for Mrs. Stanislaw Bleszynski.

TYPE MATERIAL. Holotype ♂, Madera Canyon, Santa Rita Mts., southern Arizona, 19 Aug. 1953, leg. Robert J. Ford, genitalia No. 4074—2, S.B. [S. Bleszynski] (in C.N.C.).

Eoreuma confederata, n. sp.

Fig. 4

Forewing length, 11.9 mm. Frons rounded. Labial palpi long and thin, ratio of length (with vestiture) to diameter of eye, 5/1, with closely appressed vestiture of long scales, most of which have a short, dark brown, subterminal or terminal band contrasting sharply with the very pale brownish ground color. Maxillary palpi pale, creamy white with a few dark-tipped scales externally. Forewing very pale creamy white, lines along veins concolorous, unmarked; intervenous spaces marked with irregular rows of contrasting, dark brown tipped scales, somewhat concentrated along margins between intervenous spaces and light venous areas; area from discal cell and R_{3+4} to costal margin almost unmarked. Hindwing white, unmarked.

Male Genitalia—Uncus and gnathos normal for the genus. Mesad-folded part of tegumen not unusually broad or heavily sclerotized. Vinculum emarginate ventrocephally. Costal processes of valvae large, heavily sclerotized, asymmetrical, both with large areas of very dense spicules which are longer caudally, sinistral process broadly rounded terminally, dextral one acute. Ventral processes scarcely protruding, lightly sclerotized and setose. Juxta large, lightly setose. Aedoeagus relatively short and straight, curved slightly ventrad, shorter than vinculum + valva; vesica with a long, dense area of very fine to coarse spiculation; a short, rounded, lightly sclerotized, protruding lobe dorsosinistrally at tip.

Genitally *E. confederata* is most like *E. densella*, *loftini* and *evae* (Figs. 1–3). The very pale color of the intervenous spaces, sharply and minutely dotted with fuscous, is distinctive.

TYPE MATERIAL. Holotype ♂, Limpia Canyon, Jeff Davis Co., Texas, 20 May 1950, E. C. Johnston, genitalia slide ♂ No. 4431-S.B. (in C.N.C.).

Eoreuma crawfordi, n. sp.

Fig. 5

Forewing unusually acuminate, length 6.8–8.4 mm. (two males). Labial palpi very long and thin, ratio of length (with vestiture) to diameter of eye 5.9/1. Head, both pairs of palpi and thorax whitish mottled with dull brown; scales of palpi very long and thin, each with a white tip and a subterminal brown bar. Forewing very pale brownish white, thickly clouded with darker brown scales, veins only slightly lighter. A relatively large, but not contrasting, discal dot. Costal edge narrowly and sharply whitish except at extreme base. Space between discal cell and this costal edge heavily brown shaded. A narrow, darker terminal line along outer margin, and two darker lines in fringe. Hindwing very pale brownish white with a fine, darker terminal line, fringe almost white.

MALE GENITALIA. Uncus relatively thin, without ventral, subterminal tooth, its base strengthened with a ventral, transverse bar rather than a general thickening. Gnathos normal. Mesad-folded caudal edge of tegumen wide and heavily sclerotized. Vinculum deeply emarginate laterally, more deeply ventrocephally. Costal processes of valva symmetrical, heavily sclerotized, very long, thin and acuminate, not sinuate, curving laterad. A simple, curved bar connecting base of costal process to rest of valva, basal part of valva simple with no processes or special structures. Juxta small, very lightly sclerotized. Aedoeagus almost straight, thin, caecum penis about 2/5, vesica sparsely spinulose, a pair of small, protruding subdorsal terminal lobes.

E. crawfordi is a relatively small, fragile, slender, drab species with a general brownish clouding, but scarcely any distinct markings. The forewing is unusually acuminate for males of a species of *Eoreuma*. The genitalia are quite distinctive because of the long, thin, evenly tapering, acute, laterad-curved costal processes and the lack of any distinct valval structures other than these. *E. crawfordi* is named for Prof. E. S. Crawford of the University of New Mexico, Albuquerque, whose physiological and ethological work on New Mexican Crambinae is producing most interesting results.

TYPE MATERIAL. Holotype ♂, Ames, Iowa, 25 July 1933, genitalia praep. 18 Nov. 1969, No. 1, A. B. Klots (in U.S.N.M. from Dept. of Entomology, I.S.U.). Paratypes as follows: 2 ♂♂, Ames, Iowa, 16 Aug. 1933 & 16 July 1933 (in I.S.U. & A.M.N.H.); 1 ♂, Man. Canada, July (in Bleszynski collection).

GEOGRAPHIC DISTRIBUTION—Iowa, Manitoba.

Eoreuma multipunctella (Kearfott)

Fig. 6

Chilo multipunctellus Kearfott, 1908, Proc. U. S. Nat. Mus., **35**: 393.

E. multipunctella is known only from the mountain ranges of southern Arizona, where it may be locally common. The type series consisted of 11 specimens from

Oracle (Pinal Co.), southern Arizona and the Huachuca and Chiricahua Mts. It was stated in the original description that a cotype, Cat. No. 11960 was in the U. S. National Museum and the remaining cotypes in the author's collection [whence they went to the Barnes collection and thence to the U.S.N.M.]. However, the specimen in the U.S.N.M. labelled type No. 11960 is a female from the Baboquivera (sic) Mts. which cannot be the type. I therefore designate as lectotype male a specimen, ex Barnes collection, in the U.S.N.M. from the Huachuca Mts. Arizona, leg. Poling, genitalia slide 28 March 1930, No. 2, C.H. [Carl Heinrich].

Males of *multipunctella* have a small, spheroid, invaginated, presumably corematoid structure middorsally on the caudal edge of the 3d abdominal segment. Of the other North American *Eoreuma* only *E. loftini* has a comparable structure, which in *loftini* is more of a short, transverse band.

TYPE MATERIAL. See above.

GEOGRAPHIC DISTRIBUTION. Baboquivari, Chiricahua, Huachuca, Santa Catalina and Santa Rita Mts., southern Arizona. A similar population in northern Mexico may not be conspecific.

Eoreuma callista, n. sp.

Fig. 7

Forewing length 8.9–9.1 mm. Palpi, head and thorax white. Frons rounded. Forewing with veins, including the discocellulars, broadly shining white. Intervenous spaces uniform pale yellow with a single, not quite complete, row of very sharply contrasted black dots along margins between intervenous and venous areas. No terminal line or dots. Hind wings white.

MALE GENITALIA. Uncus thick, expanded basally and terminally, more or less compressed, with a ventral, subterminal tooth in some specimens. Gnathos strong and heavily sclerotized, evenly but strongly curved to tip. Tegumen, as usual in genus, with its caudal edge deeply folded mesad. Vinculum strongly produced ventrocephally and very deeply emarginate. Costal processes symmetrical, long, thin, slightly thickened subterminally, acuminate, sharp, curved ventromesad. A simple, curved bar connecting bases of costal processes to remainder of valva and running caudad. No other valval processes; cucullus long, thin, somewhat spatulate. Juxta small, not heavily sclerotized. Aedoeagus tubular, shorter than vinculum + valva, with one strong cornutus.

E. callista is an extremely distinctive species both in color and pattern and in genitalia. The apex of the forewing is somewhat blunter than in other *Eoreuma*. Genitally it is more like *E. multipunctella* and *crawfordi* in the structure of the valva, but is the only *Eoreuma* to have a cornutus, a structure comparatively rare in Chiloini. In addition to the hypodigm listed below I have seen a specimen, without abdomen, Roswell, New Mexico, 22 August, T. D. A. Cockerell, in B.M.

TYPE MATERIAL. Holotype ♂, Albuquerque, Bernalillo Co., New Mexico, 27 August 1964, at light (C. S. Crawford), genitalia praep. 7 Dec. 1969, A. B. Klots (in A.M.N.H.); allotype ♀, Lordsburg, Hidalgo Co., New Mexico, 4 Aug. 1937 (Herbert Ruckes, Sr.) genitalia praep. 19 March 1965, A. B. Klots (in A.M.N.H.). Paratypes as follows: 2 ♂♂ & 1 ♀, Lordsburg, New Mexico, 4 Aug. 1937 (Herbert Ruckes, Sr.) (in A.M.N.H.); 1 ♂, Laguna, Bernalillo Co., New Mexico (Geo. Willett) (in L.A.C.M.); 1 ♂, Edgewood, Santa Fe Co., New Mexico, 12 July 1969 (M. & E. Roshore) received from Bryant Mather, (in A.M.N.H.); 1 ♂, Portal, Cochise Co., Arizona, 4,700 ft. alt. at light, 1 Aug. 1964 (J. H. Puckle, M. A. Mortenson & M. Cazier) (in A.S.U.T.); 1 ♂, Palo Duro Canyon St. Park, Texas, 15 Apr. 1969, A. & M. E. Blanchard (in Blanchard collection).

GEOGRAPHIC DISTRIBUTION. See above.

XUBIDA Schaus, 1922, Proc. Ent. Soc. Washington, **24**: 140

Type species: *Xubida dentilineella* Schaus, 1922, p. 141, by original designation.

As here delimited *Xubida* consists of a considerable number of neotropical species, including the type species which is known from Guatemala, as well as the North American species dealt with below. *X. dentilineatella* is closer to the tropical group than any of the other North American species and, in fact, may be a recent arrival or introduction. The other North American species form something of a mixed group which may have to be separated into two or more other genera when the very extensive, largely unknown, neotropical fauna has been studied.

The genus may be characterized as follows: uncus and tegumen broad and quite flattened basally, long and almost straight caudally, acuminate, slightly hooked terminally; tegumen with long, thin, tapering pedunculi with their caudal margins folded mesad; juxta simple, not very heavily sclerotized, with no caudolateral extensions; costal processes of valvae large to very large, strongly sclerotized, often separated from rest of valva by a suture; ventrad of costal process on mesal face of valva a "median process," and a more or less distinct "ventral process" on ventral margin; the ventral process may be a development of the sacculus, which is not clearly discernible in so many Chiloini, and the "median process" may be a homolog of the sclerotized median structure, the "clasper," marking an important muscle attachment, found in many groups of Lepidoptera; frons rounded; ocelli and chaetosomata present; pattern mostly of dark lines along and between veins; transverse markings usually vestigial or absent; sometimes the submarginal line is traceable, running out from costa to form a long point beyond the cell, then running dorsobasad with a zigzag to about the middle of the dorsal margin.

KEY TO NORTH AMERICAN *Xubida* BY EXTERNAL CHARACTERS

1. Ground color white to brownish white, pattern almost entirely of dark lines along and between veins; transverse markings, if any, isolated traces of submarginal (sm) and median-postmedian (m-pm) lines 2

5. Costal process strongly curved mesad and ventrad, especially terminally --- *X. punctilineella*
Costal process curved dorsad and somewhat laterad *X. lipan*, n. sp.
6. Median process with a group of short, strong setae terminally; vinculum rounded
ventrocephalically *X. dentilineatella*
Median process with not more than one projecting spine or tooth terminally 7
7. Median process with a wide, blunt, angulate point extending mesad from tip; costal
process flattened and somewhat concave, tapering little, ending abruptly with a
mesad hook *X. panalope*
Median process rounded terminally with a single, small, projecting spur; costal process
tapering gradually from base, little flattened, ending in a long, sharp, not hooked
point *X. relovae*, n. sp.

Xubida linearella (Zeller)

Fig. 8

Crambus linearellus Zeller, 1863, Chilodinarum et Crambidarum, Genera et Species, No. 114, p. 44.

Spermatophthora multilineatella Hulst, 1887, Entomologica Americana, **3**: 134.

The type of *C. linearellus* Zeller, long thought to be lost, recently turned up in the Vienna Museum. Thanks to Dr. S. Bleszynski I have studied the dissection of its genitalia, which permit positive identification. Unfortunately Zeller did not know where it had been collected ("Hab. in America sed in quaejuss parte incertum est.") but it is almost certain that it must have come from Florida. Accordingly I designate Florida as the type locality for this nominal species.

The name *multilineatella* Hulst has been generally used for this same species, although many identifications have been faulty because of the unreliability of color and pattern. Hulst described *multilineatella* from two males from Florida. Search of the Hulst collection in the American Museum of Natural History, and of all other collections that might contain Hulst material, including the Museum of Comparative Zoology, Academy of Natural Sciences, Department of Entomology of Cornell University, Carnegie Museum and U. S. National Museum has revealed no trace of either of Hulst's syntypes, which must be presumed lost. It is highly desirable that, in order to stabilize the nomenclature of the species involved, a neotype be designated for *Spermatophthora multilineatella* Hulst. Dr. S. Bleszynski, the only other worker at present active in the New World Crambinae, agrees with this. Accordingly a ♂, Winter Park, Florida, May, 1946, leg. A. B. Klots, genitalia praep. 21 March, 1964, #4 by A. B. Klots (fig. 8) is hereby designated. This specimen is in the American Museum of Natural History, where nearly all surviving Hulst types are located. *S. multilineatella* is to be considered a subjective junior synonym of *C. linearellus* Zeller. The type of *C. linearellus* was not chosen as the neo-

type of *multilineatella*, which would have made the latter an objective junior synonym, because of its lack of locality data.

X. linearella is relatively common in Florida, elsewhere known only from North Carolina. In color and pattern it is not always easy to distinguish from the likewise common, widespread *X. panalope*, but its markings tend to be a grayer brown and wider and more diffuse; while *panalope* tends to have the intervenous dark line beyond the cell, in cell M_1 , lighter than the adjacent intervenous dark lines; the genitalia are very different. Genitally *linearella* is more like *X. punctilineella* and *X. lipan* (see below) differing chiefly in the length of the costal process of the valva (see key). It differs consistently from *punctilineella* in size and color and pattern. On the whole it is most like *lipan*.

TYPE MATERIAL. *linearella*, unique type ♂, "America," genitalia dissected by S. Bleszynski, (in N.M.W.); *multilineatella*, neotype ♂, hereby designated (see above) (in A.M.N.H.).

GEOGRAPHIC DISTRIBUTION. Florida, North Carolina.

Xubida panalope (Dyar)

Fig. 14

Platytes panalope Dyar, 1917, *Insecutor Inscitiae Menstruus*, **5**: 86-87.

Platytes acerata Dyar, 1917, *Ibid.*, **5**: 86.

In the original descriptions *acerata*, from Florida, was described as darker and more heavily marked than *panalope*, from Connecticut. In general this distinction holds true, northern specimens averaging lighter than southern ones (77 specimens studied by the present writer). However, far more material will have to be studied before any conclusions can be made about a subspecific relationship of these two nominal species. On the basis of color, pattern, venation and male genitalia they appear to be conspecific. As Dyar pointed out the dark intervenous line running from the end of the discal cell to the outer margin is usually lighter than the intervenous lines in the other cells, giving the impression of a pale ray running out from the cell. This is quite noticeable in lightly marked specimens, but is barely, if at all, distinguishable in darker, more heavily marked ones, especially if they are worn. *X. linearella* and *X. lipan* do not show this. As also noted by Dyar, vein R_2 is frequently, but not always, stalked with R_{3+4} , a character not noted in other species of the genus. For the

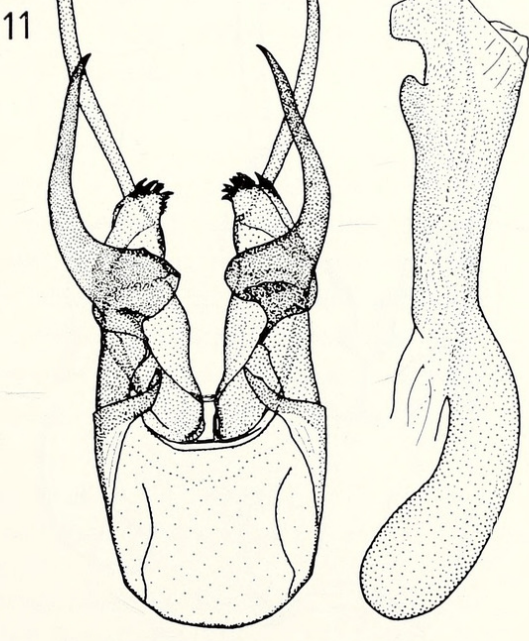
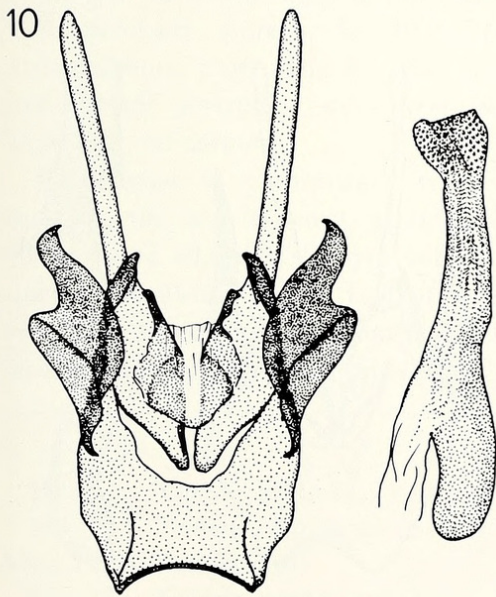
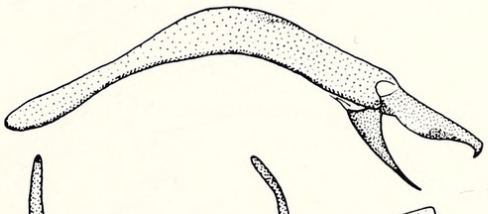
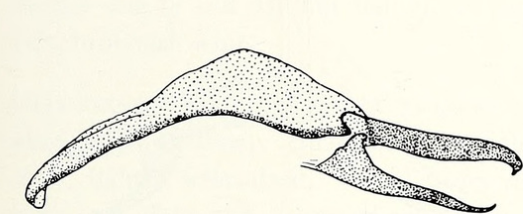
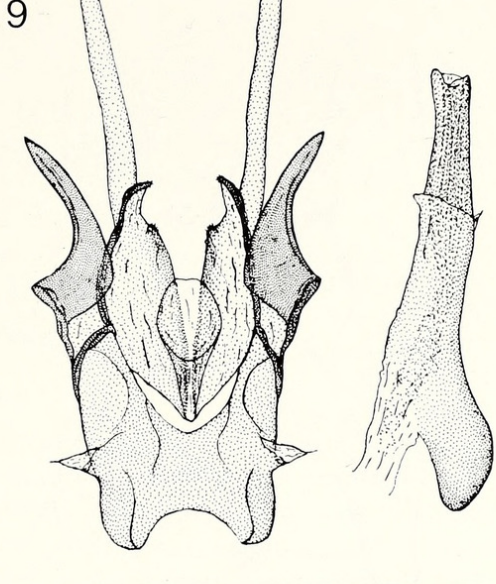
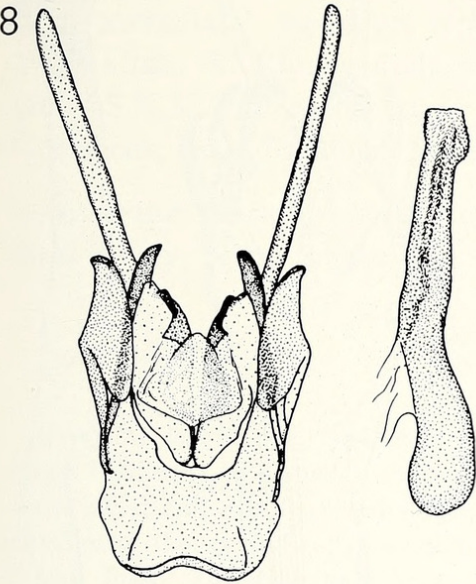
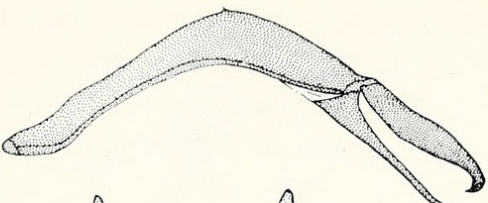
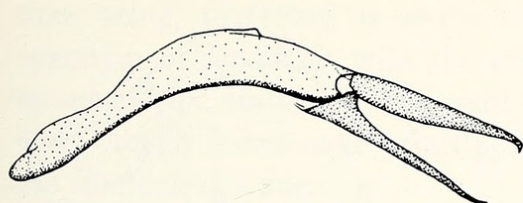
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FIG. 8. *Xubida linearella* (Zeller), neotype of *Spermatophthora multilineatella* Hulst, Winter Park, Florida.

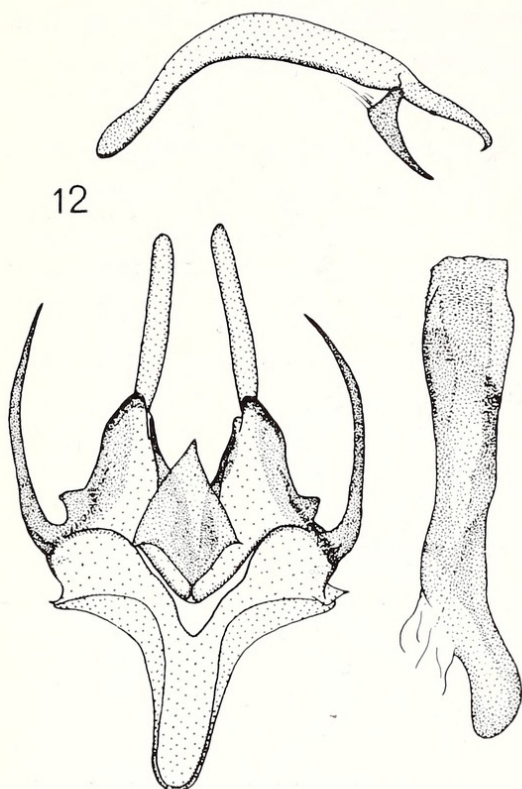
FIG. 9. *Xubida lipan*, n. sp., paratype, near Brownsville, Texas.

FIG. 10. *Xubida punctilineella* (Barnes & McDunnough), Port Sewall, Florida.

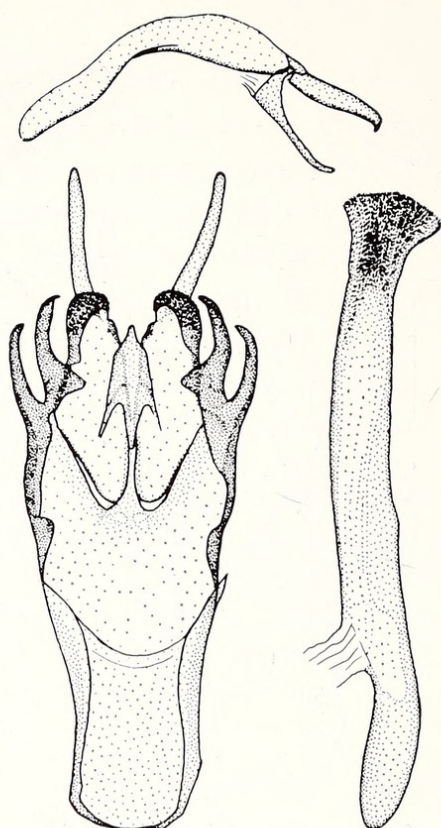
FIG. 11. *Xubida dentilineatella* (Barnes & McDunnough), Baboquivari Mts., Arizona.



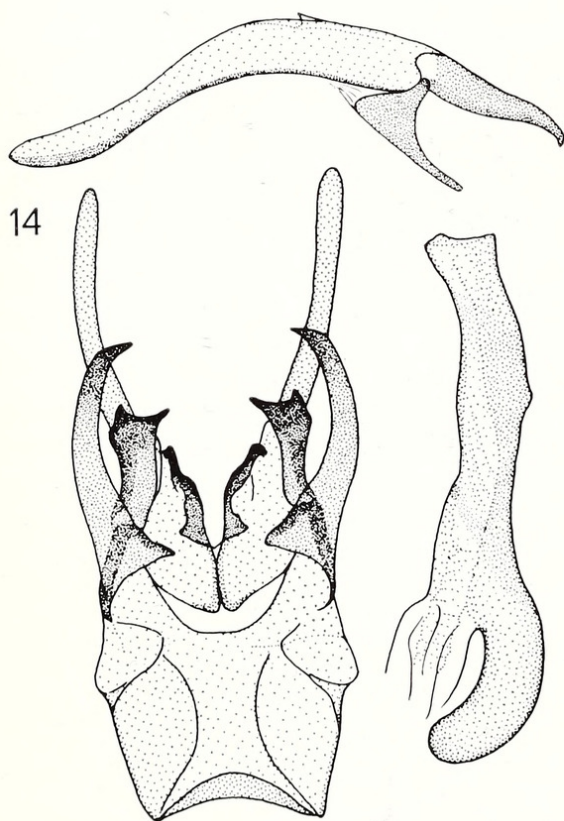
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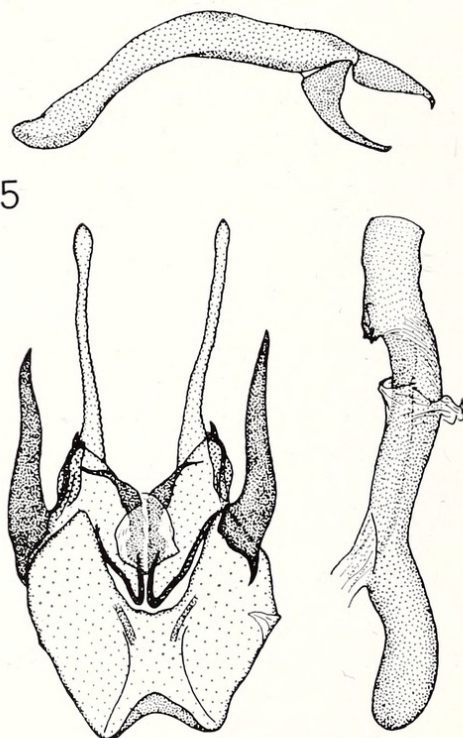
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time being, therefore, it seems best to place *acerata* as a subjective junior synonym of *panalope*, with the realization that in the future it may be raised to subspecific status. The present writer places *acerata* as the junior synonym, even though it has page priority, acting as first reviser under Article 24(a) of the Zoological Code.

TYPE MATERIAL. *panalope*, type ♂, No. 21140, East River, Connecticut, Aug. 1907, Chas. R. Ely, genitalia slide 15 April 1955, No. 10803, H. W. Capps (in U.S.N.M.); *acerata*: type ♂, No. 21147, Dade City, Florida, Sept., J. A. Grossbeck, genitalia slide 5 March 1955, No. 10384, H. W. Capps (in U.S.N.M.).

GEOGRAPHIC DISTRIBUTION. Connecticut, Florida, Iowa, Mississippi, Missouri, New Jersey, Nova Scotia, Texas.

Xubida relovae, n. sp.

Fig. 15

Forewing length 8.0 (type) and 7.65 mm. Frons rounded. Labial palpi, ratio of length (with vestiture) to diameter of eye, 3.8/1; vestiture of second segment expanded terminally. Both labial and maxillary palpi light brown laterally, white dorsally. Head white dorsally. Dorsum of thorax and collar white mottled with brown; tegula white with two longitudinal brown lines. Forewing pale brownish white, veins lined with light reddish brown and intervenous spaces centered with light reddish brown lines, those in cells R_4 - Cu_{1b} inclusive ending in small, dark marginal dots. A small, but pronounced, dark discal dot. Dark intervenous line in cell M_1 not lighter or more diffuse than those in adjacent cells. Hind wing pale, brownish white.

MALE GENITALIA. Uncus and gnathos relatively very short and wide basally. Vinculum wide, very shallowly emarginate caudolaterally, more deeply so ventrocephally. Juxta weak, lightly sclerotized. Costal processes of valvae large, long, heavily sclerotized, basally thick, not flattened, tapering gradually to sharp points, slightly sinuate. Median processes well sclerotized, more or less flattened and concave mesally, very weakly setiferous, with a single short, protruding terminal spur. Ventral processes well sclerotized but very small and scarcely protruding, very finely setose. Aedoeagus very large, caecum penis nearly $\frac{1}{2}$ its length; no cornuti.

X. relovae is distinguished from *X. panalope* by the relatively shorter uncus and tegumen, the non-flattened, acuminate costal processes and the distinctive median process of the valva which is rounded with a single short, projecting spur. In pattern it is apparently distinguished by the lack of a paler dark marking in cell M_1 , but not enough specimens are available to demonstrate this. Occasional specimens of *panalope* have costal processes more like those of *relovae*. The species is named for Miss Carmen Relova,

←

FIG. 12. *Xubida puritella* (Kearfott), Portal, Cochise Co., Arizona.

FIG. 13. *Xubida chiloidella* (Barnes & McDunnough), Peña Blanca Canyon, Oro Blanco Mts., Pima Co., Arizona.

FIG. 14. *Xubida panalope* (Dyar), Siesta Key, Sarasota, Florida.

FIG. 15. *Xubida relovae*, n. sp., holotype, Port Sewall, Florida.

Scientific Assistant of the Department of Entomology of the American Museum of Natural History, in appreciation of her manifold labors on the Crambinae.

TYPE MATERIAL. Holotype ♂, Port Sewall, Martin Co., Florida, 21 Jan. 1949, genitalia praep. A. B. Klots, 13 March 1956 #3 (in A.M.N.H.); paratype ♂, Biloxi, Mississippi, 13 June 1917, Cornell U. Lot 542, sub. 11, genitalia ♂ 4534, S.B. (in C.U.).

Xubida punctilineella (Barnes & McDunnough)

Fig. 10

Platytes punctilineella Barnes & McDunnough, 1913, Contributions Nat. Hist. Lepidoptera N. A., 2: 177, pl. 2, fig. 11.

X. punctilineella is distinctive in size, color and pattern and male genitalia, and appears to be limited to Florida. In the size and extent of the costal processes of the valvae it falls into a small group of species with *X. linearella* and *X. lipan*.

TYPE MATERIAL. Type ♂, Everglade, Florida, Apr. 8–15, genitalia dissected, R. W. Hodges #3780 (in U.S.N.M.).

GEOGRAPHIC DISTRIBUTION. Central and southern Florida.

Xubida lipan, n. sp.

Fig. 9

Forewing length 6.4 mm. (small ♂)—10.2 mm. (large ♀). Frons rounded. Labial palpus, ratio of length to diameter of eye, 4/1. Palpi with outer surfaces brown, dorsal surfaces white. Head white. Collar and tegula white with some brownish mottling. Dorsum of thorax white with some brownish streaking posteriorly. Forewing white, slightly brownish tinged, veins and lines in intervenous spaces dull brown, the veins narrower. A small black marginal dot at the end of each intervenous line in cells M_1 – Cu_{1b} inclusive. A small, but distinct, fuscous discal dot. Dark intervenous line in cell M_1 not paler or less conspicuous than lines in adjacent cells. Traces of m-pm line visible, especially as a diagonal line from near costa slanting distad to beyond end of cell, a dark mark in cell M_1 and a broken diagonal line running dorsocaudad from near end of cell, about base of Cu_{1a} , to dorsal margin basad of middle. Hind wing slightly brownish tinged, fringe white.

MALE GENITALIA. Tegumen, uncus and gnathos normal for genus. Vinculum broad, laterocephalically and ventrocephalically emarginate. Juxta very lightly sclerotized. Costal process of valva large, well sclerotized, its basal part large and expanded dorsolaterally, its free process long and thin, far exceeding median process caudally, flat, in normal position curved dorsad. Median process (lying between costal and ventral process) flat, rounded terminally, curved mesad to ventromesad, short, narrow, well sclerotized, terminally irregular with fine setation. Ventral process, lying along ventromesal margin of valva, short, thin, well sclerotized, terminally irregular, with fine setation. Aedoeagus relatively short; no cornuti.

In size, color and pattern *X. lipan* most resembles *X. linearella*, *panalope* and *relovae*. Its dark markings are not as heavy or as diffuse as those of

linearella, and are more reddish or orange brown. It differs from *panalope* in not having the intervenous space in cell M_1 lighter, and in not having vein R_2 stalked on R_{3+4} as *panalope* frequently does. In male genitalia it is extremely distinct from both *panalope* and *relovae* (see key and Figs. 14 & 15), most so in the median process of the valva. Genitally it is more like *X. punctilineella* and *linearella*; it differs strongly from the former in color and pattern (see key) and from both in the shape and extent of the costal process of the valva. It may actually be closely related to *X. linearella*, and since the two are allopatric they might be considered conspecific but subspecifically distinct; study of material from the Gulf Coast between Texas and Florida might help to define their relationship.

TYPE MATERIAL. Holotype ♂, Conroe, Montgomery Co., Texas, 27 April 1967, (A. Blanchard) genitalia praep. 27 Jan. 1969, #1, A. B. Klots (in A.M.N.H.); allotype ♀, near Brownsville, Cameron Co., Texas, 26 June 1969 (R. Heitzman) (in A.M.N.H.). Paratypes: 2 ♂♂, Conroe, Texas, 24 Apr. 1962 & 1 May 1966 (A. Blanchard) (in A.M.N.H. & Blanchard collection); 3 ♂♂, near Brownsville, Texas, 25, 26 & 27 June 1969 (R. Heitzman) (in A.M.N.H. & Heitzman collection); 1 ♀, Brownsville, Texas, 26 May 1928 (F. H. Benjamin) (in U.S. N.M.); 2 ♂♂, Corpus Christi, Texas, 15 & 28 Apr., 1943 (W. M. Gordon) (in B.M.); 2 ♂♂, same locality and collector, 4 June & 25 Sept.—15 Oct., 1943 (in C.U. & A.M.N.H.); 2 ♀♀, same locality and collector, 8 & 14 May 1943 (in C.U. & A.M.N.H.); 2 ♂♂, Corpus Christi State Park, near Mathis, San Patricio Co., Texas, 16 & 17 June 1969 (R. Heitzman).

GEOGRAPHIC DISTRIBUTION. See above.

Xubida dentilineatella (Barnes & McDunnough)

Fig. 11

Platytes dentilineatella Barnes & McDunnough, 1913, Contrib. Nat. Hist. Lepidoptera North America, 2: 138–139, pl. 9, Figs. 16–17.

This species is readily distinguished by the general lack of distinct venous and intervenous lines, the dark shade running diagonally dorsobasad from the apex and the general yellowish brown color, most pronounced distally. It is a member, in fact, of a group of species, much alike in appearance and genitalia, which has many representatives in Mexico and Central America. The type species of *Xubida*, *dentilineella* Schaus, is a member of this group. *X. dentilineatella* appears to be quite rare.

TYPE MATERIAL. Type ♂, Palmerlee, Arizona, genitalia dissected, R. W. Hodges #3779 (in U.S.N.M.).

GEOGRAPHIC DISTRIBUTION. Southern Arizona; Mexico: Baja California.

Xubida puritella (Kearfott)

Fig. 12

Chilo puritellus Kearfott, 1908, Proc. U. S. Nat. Mus., **35**: 393.*Platytes dinephelalis* Dyar, 1917, Insecutor Inscitiae Menstruus, **5**: 85.

This species shows considerable sexual dimorphism, males being much darker than females, often with pronounced dark shades on the forewings and dark gray hind wings, while females are very pale, almost white, and very lightly marked with dark scales along and between the veins. Kearfott named the one species from a female, Dyar the other from males.

TYPE MATERIAL. *puritella*, type ♀, Baboquivaria (sic) Mts., Pima Co., Arizona, July 15–30, 1902 (O. C. Poling), genitalia praep. R. W. Hodges #3785 (in U.S.N.M.); *dinephelalis*, type ♂, No. 21139, Baboquivera (sic) Mts., Pima Co., Arizona (through Dr. William Barnes) (in U.S.N.M.).

GEOGRAPHIC DISTRIBUTION. Baboquivari, Chiricahua, Huachuca and Santa Rita Mts., southern Arizona.

Xubida chiloidella (Barnes & McDunnough)

Fig. 13

Crambus chiloidellus Barnes & McDunnough, 1913, Contrib. Nat. Hist. Lepidoptera North America, vol. 2, no. 3, p. 138, pl. 8, fig. 10.

This species was named as a *Crambus* because of the idea that the stalking of vein R_2 on R_{3+4} was an important and unvarying generic character, which it is not. In all other ways *X. chiloidella* is a perfectly normal member of the Chiloini and of the genus *Xubida*. The strongly bifid costal process of the valva and the relatively large size and clear-cut dark markings are distinctive.

TYPE MATERIAL. Type ♂, White Mts., Arizona (Lusk) (in U.S.N.M.).

DISTRIBUTION. Southern and central Arizona.

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