

DESCRIPTIONS OF NEW SPECIES OF NORTH AMERICAN CRAMBID MOTHS.

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Among the fifty-odd thousand specimens of North American microlepidoptera which I have acquired during the past ten years, there have been many specimens belonging to the subfamily Crambinae of the Pyralidae, which have been placed in storage boxes awaiting an opportunity for authentic determination and arrangement. During the early part of this year I spent several days in Prof. C. H. Fernald's hospitable home, and, with his aid, secured the names of all that were already described; but there remained a large number of species that were apparently new to science.

Only the most interesting of these, and only those that are represented usually by good series, are treated in the present paper. There is an opportunity in this family for an excellent piece of work, with the aid of the microscope and camera-lucida, which would open up a wide field in the wonderful diversity and characters of the antennae and head parts particularly, as may be noted by figs. 7 to 12 on pages 387 to 391, representing some of the Thaumtopsids. I hope some one with more time to devote to the group will become as enthusiastic as I have after this brief study. The most necessary work of reference, treating of the world's genera and species, is Hampson's Classification in the Proceedings of the Zoological Society of London, 1895, and, of course, for the North American fauna, Fernald's Revision of 1896 will be found useful.

Genus *USCODYS* Dyar.^a

Head with small tuft of broad-raised scales between antennal joints, frons slightly roughed.

^a At the last moment, I am compelled to withdraw a new name proposed for this genus, and substitute *Uscodys*, erected by Dr. Dyar in a paper issued Sept. 15, 1908, a part of the Proceedings of the Entomological Society of Washington. Vol. X, and thus avoid a synonym.

Antenna, male, slightly dentate and microscopically pubescent; female, simple, basal joint large and ridged on inner side, forming a deep socket in which the second joint is movable.

Labial palpi extends $3\frac{1}{2}$ times eye-width beyond head, second joint densely tufted below, tuft reaching to end of apical joint; latter obtusely pointed and except at base not hidden by scales of median joint.

Maxillary palpi, nearly half length of labial, triangularly scaled.

Tongue moderate, closely coiled between labial palpi.

Ocelli absent.

Thorax smooth.

Fore wing over $2\frac{1}{2}$ times as long as wide; costa very slightly ached, curving more to apex; latter rounded, obtuse; termen slightly convex.

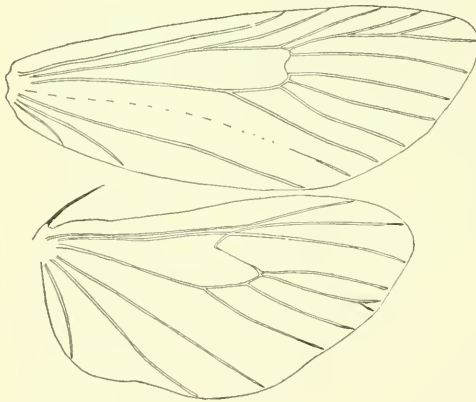


FIG. 1.—VENTATION OF *USCODYS CESTALIS*.

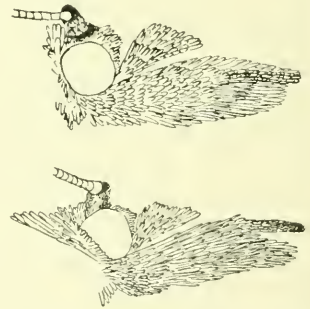


FIG. 2.—TWO VIEWS OF HEAD STRUCTURE OF *USCODYS CESTALIS*.

about 45° ; dorsal margin nearly straight. Vein 1^{abc} present; 1^b not furcate at base; 2 from outer fifth of cell; 3, 4, and 5 about equidistant at origin; 6 from below upper angle; 7, 8, and 9 stalked; 10 separate close to $7+8+9$; 11 from outer third of cell.

Hind wing, lower median vein with long scales above; frenulum of one spine only in both sexes; slightly wider than fore wing; costa slightly depressed before middle and convex beyond, apex obtusely rounded; termen 45° . Veins 1^{abc} present; 1^b not furcate at base; 2 from outer fourth of cell; 3 before end of cell; 4 and 5 close at origin from lower angle ^a; 6 and 7 connate from upper angle; 8 very close to cell its whole length, but not coincident with it as in other Crambinae.

Legs smoothly scaled.

Habitus rather stout.

Type.—*Uscodys cestalis* Hulst.

^a The furcation at outer end of vein 4 of hind wing as shown in fig. 1 has been only found in one side of one specimen; a number of others examined showed no trace of this abortion.

USCODYS CESTALIS (Hulst).

Ancrastia cestalis HULST, Trans. Amer. Ent. Soc., XIII, 1886, p. 164.

Aglossa cestalis FERNALD, Smith's List Lep. Bor. Amer., 1891, No. 4215.

Aglossa cestalis FERNALD, Bull. 52., U. S. Nat. Mus., 1902, No. 4512.

Aglossa costalis KEARFOTT, Smith's List Lep. Bor. Amer., 1903, No. 4883.

Uscodys cestalis, DYAR, Proc. Ent. Soc. Wash., X, 1908, p. 101.

After examination of specimens of this species in 1904 Doctor Dyar advised me that it belonged to neither the Epipaschiinae nor the Pyralinae, where it had been placed by Hulst and Fernald, but should be included in the subfamily Crambinae, suggesting that it was "*n. gen. et sp.*" Shortly afterwards, when visiting the Hulst collection at New Brunswick, he saw Hulst's type, thus securing the specific name.

The species seems to be very abundant in southwestern Arizona. More than one hundred specimens have passed through my hands from both desert and mountain collections. Among the localities are Yuma County, Arizona, desert, March 26 to April 10, J. B. Smith; Yavapai County, Arizona, March 10-31, J. B. Smith; southern Arizona, August 1-15, O. C. Poling; Baboquivaria Mountains, Pima County, Arizona, July 15-30, O. C. Poling.

The species is somewhat variable in the intensity of the markings and of the light and dark shades. The females have dark gray or dark cinereous hind wings, while these wings in the male are whitish gray. The fore wings of the males are also lighter generally than the other sex. The general appearance of the fore wing is a mottled gray, with a conspicuous triangular whiter patch on upper half of wing and touching costa from middle to outer fifth; the males average from 22 to 26 mm. and the females from 25 to 32 mm.

This species seems to have been entirely ignored by both Ragonot and Hampson in the seventh and eighth volumes of Romanoff's Mémoires sur les Lépidoptères.^a It does not appear in the specific index of either volume, nor could I find it in the text or footnotes approximating the place it should be if Hulst's generic position had been followed.

PRIONAPTERYX STEPHENS and allied genera.

The species included in the four genera below bear a strong superficial likeness to each other and readily form a small subfamily group in the Crambinae which are not easily confused with any other species or genera of the large family. Except in one genus (*Surattha*) they are all characterized by an incision in the termen of fore wing at end of vein 5, or in more modified species the termen below 5 is well cut away, leaving a projection on the upper half of wing.

In markings the species are of combinations of cream white, ochreous to dark brown or grayish brown; the inner line is usually

^a Monographie des Phycitinae et des Galleriinae.

strongly dentate and is frequently emphasized by enlarged spots on lower half. The terminal line and costal, apical, and marginal spots are the most constant marks for separation, and with good figures bringing out these characters, it would be very easy to separate the species.

The venation and structural characters seem to be subject to very little variation in each species, but there is a great divergence in the different species, quite sufficient, I think, to divide some of the genera into several others or subgenera. I have not thought it necessary to go into these differences at the present time, as the subject is so ably covered by Sir George Hampson's classification, hence particular attention is only called to the structure of such species as are characterized as new.

No doubt continued collecting in Mexico, Central and South Americas will add many interesting species to the lists, as the groups seem to be most common in the subtropical regions. Little or nothing is known of the life histories, excepting one species, *P. nebulifera* Stephens, which has been well worked out by Mr. E. Daecke.^a

The larva of this species is solitary, feeding on the leaves of huckleberry (*Vaccinium* sp.) and sand myrtle (*Dendrium buxifolium*). It has the peculiar habit of constructing a tube of sand and silk on the stalk and stems of its food plant, forming a covered, protecting passage from a hole in the ground near the root, into which it retreats when danger threatens, to the fresh leaves upon which it feeds.

This clew should assist collectors in the arid regions of Arizona and New Mexico to the life histories of the several species which are quite common there, especially as these tubes must be rather conspicuous objects.

ANALYTICAL KEY TO GENERA.

1. Fore wing with termen entire.....*Surattha* Walker.
Upper half of termen strongly produced..... 2
2. Vein 6, hind wing, from upper angle of cell ^b.....*Mesolia* Ragonot.
Vein 6, from below angle..... 3
3. Veins 4 and 5, fore wing, separate at origin.....*Prionapteryx* Stephens.
Veins 4 and 5, stalked or connate.....*Eugrotca* Fernald.

Genus SURATTHA Walker.

Surattha WALKER, Cat. Brit. Mus., XXVII, 1863, p. 75.

Catarina WALKER, Cat. Brit. Mus., XXXV, 1866, p. 1770.

Surattha HAMPSON, Proc. Zool. Soc. Lond., 1895, p. 965.

Hampson's description of this genus is as follows:

Palpi porrect and thickly scaled, extending about one and a half times length of head; maxillary palpi triangularly scaled; frons with a conical process;

^a Entom. News, XVI, pp. 12-14, pl. II.

^b In some male specimens of *M. oracutella* vein 6 is from slightly below upper angle.

antennæ of male bipectenated, usually with long branches: tibiae with the spurs long, the outer spurs about two-thirds length of inner.

Fore wing long and narrow; the apex rounded; vein 3 from near angle of cell: 4, 5 usually on a long stalk; 6, 7, and 10, 11 free. Hind wing with vein 3 from near angle of cell: 5 absent: 6 obsolete, from above middle of discocellulars: 7 anastomosing with 8.

SURATTHA(?) SANTELLA, new species.

Expanse, 19 mm.

Palpi, head and thorax dark cream, speckled with light brown; the outer ends of palpi, both inside and out, are shaded with darker brown; antennæ dark cream, annulated with light brown; abdomen whitish cream, upper side first segment shaded with reddish brown, and a brownish tinge on the next two segments, anal tuft ochreous brown; legs cream white; tarsi annulated with brown.

Fore wing white, with shades and marks of light and dark ochreous brown. There is a transverse white line in middle of wing, with two sharp angulations on outer edge, in middle of wing; before this line the basal half is white, well mottled with light and dark brown. Beyond the line there is a parallel light brown line of same width; between this and the terminal and apical lines and marks the surface is principally white, dusted with brown in horizontal streaks. About one-sixth before apex the white subterminal line starts from costa and goes straight to termen at end of veins 4 and 5; it then goes obliquely inward to fold, below end of cell, having two spurs below; it then follows fold outward nearly to termen, where it is lost in the mottled ground color. It is paralleled on both sides by brown; on the outside the brown shade extends to the white terminal patches. Just before apex is a broad white dash from costa to termen at end of vein 6, connecting there with a small white dot, on which is a black dot. Between 5 and 2 is a white terminal patch containing three black dots. The cilia is shining white, alternated with light fuscous in middle of wing and darker at apex; before the cilia is a narrow light brown line. Over the upper angle of cell is a prominent rounded brown dot.

Hind wings light, smoky gray, cilia whitish, underside the same. Underside fore wing pale ochreous brown, with white apical and terminal spots faintly repeated.

Described from 2 specimens collected by O. C. Poling in South Arizona.

Types in Author's collection.

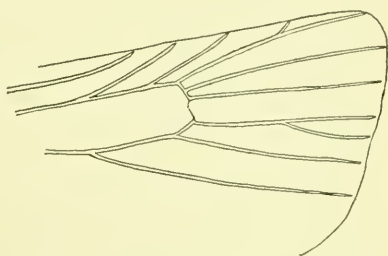


FIG. 3.—VENATION OF FORE WING OF SURATTHA SANTELLA.

This species differs from Hampson's diagnosis of *Surattha* in following items:

Antenna simple, not bipectenated.

Tibial spurs, both pairs nearly same length, outer at least three-fourths as long as inner. Otherwise the venation is identical with Hampson's figure. The conical process on front of head is a curious chitinous extension of the clypeus (?), and is no doubt used by the moth for effecting its escape from its probably earthy, dry, and hard pupal habitation. Fig. 3 shows outer end of fore wing.

SURATTHA INDENTELLA, new species.

Expanse, male. 22.5-23.5 mm.

Head white in front, light ochreous above; labial palpi white internally, externally pale ochreous, shaded with brown at apex; maxillary palpi pale ochreous; antenna bipectinate, with long branches, stalk whitish, branches blackish brown; thorax creamy ochreous, the outer ends of scales slightly darker, especially of patagiæ; abdomen light grayish ochreous, posterior edge of each segment narrowly white above, the three first segments shaded with ochreous above; legs whitish, dusted with pale ochreous.

Fore wing, ground color creamy ochreous; the outer ends of scales are light brown, giving a speckled appearance under lens; there is a dark brown oblique fascia from inner fifth of costa to inner third of dorsum, almost obsolete at costa, but broad and well defined on lower four-fifths; a dentate transverse brown line at middle of wing, with two strong outward spurs; both the basal fascia and the dentate inner line are edged on both sides by paler lines. The subterminal line from outer sixth of costa is only slightly oblique to upper third, then slightly convex to outer fifth of dorsum, it is white, overlaid with shining pinkish scales; inwardly it is defined by a dark brown line; below middle of wing the white extends into marginal space and is marked by three horizontal black dashes; above middle, ground color is brown with a whitish cloud before apex. Terminal edging brown. Between subterminal line and inner dentate line is a small brown discal dot on upper third of wing. Cilia whitish ochreous, shaded with light fuscous, cut by a white dash at middle; above this the basal half of cilia is conspicuously darker than outer.

Hind wing, dark smoky brown, paler toward base, cilia whitish; underside lighter, with a whitish streak from base to termen, through middle of cell and between veins 4+5 and 6. Underside fore wing light ochreous brown.

Two male specimens, from National Museum collection, Amarillo, Texas, August 30, 1902, Cockerell.

Cotypes.—Cat. No. 11948, U.S.N.M., and in Author's collection.

The venation and structure of this species agrees exactly with Hampson's, fig. 47, p. 965, Proc. Zool. Soc. Lond., 1895, except that termen of fore wing is slightly indented at veins 4 and 5.

ANALYTICAL KEY TO SPECIES OF MESOLIA.

1. Fore wing with whitish or yellowish mark on middle of costa.
incertella Zinck.
 This character absent----- 2
2. Ground color fore wing principally white-----*oraculella* Kearfott.
 Ground color principally ochreous gray----- 3
3. Dentations of inner line of fore wing acutely pointed.
huachucacilla Kearfott.
 Points of these dentations rounded or obtuse-----*baboquivariella* Kearfott.

MESOLIA ORACULELLA, new species.

Expanse, male, 20–24 mm; female, 27–30 mm.

Head with conical process in front, light brown in front, darker brown around and between bases of antennæ, these shades separated by a cream white transverse line; labial palpi cream white, heavily overlaid externally, in male with grayish-brown, more lightly in female; maxillary palpi cream white, apical joint shaded with light brown; antennæ, male flattened and broadened, female simple, grayish cinereous; thorax, collar and patagia cream white, former shaded with light brown dorsally and latter at base, centrally the thorax is bronzy gray; abdomen dark cream or pale coffee color, posterior edges of first three segments ochreous; legs cream white, tarsi banded with light brown.

Fore wing, a broad median white streak and the costa edged with white, beginning at inner third and broadening outwardly; elsewhere the ground color is light grayish brown. The inner line begins on costa between middle and outer third as an outwardly oblique brown dash on the white ground color; below this are two superimposed horizontal dashes of darker brown, their outer ends connected by an ochreous brown curved line; the lower dash is in the middle of the white median streak; beyond middle of wing on vein 1^b is a dark brown streak with a short upper limb beneath the white median band and a longer lower limb following 1^b to tornus; between this dorsal mark and the spots in middle of wing the inner line is obsolete. The subterminal line is an oblique brown line from outer fifth of costa to upper third of wing, thence to tornus, slightly outwardly concave, it is edged outwardly with a white line of equal width; beyond the color is light brown, cut on upper third by a fine white line which nearly reaches termen below apex; on the lower two-thirds is a large white oblong spot, containing no black dots or dashes. Before the cilia is a fine brown, terminal line. Above the incision the cilia is white, divided by a broad brown line and edged outwardly with brownish gray; in the incision are a few long white scales without any brown markings; below incision cilia is white, shading outwardly into grayish brown. The lines from costa on upper third of wing are all parallel to each other. The white shade between the

inner and subterminal lines in some specimens forms a distinct white fascia, more or less dusted, especially on the veins with brown. There is a variation in the specimens, caused by the intensity of the brown sealing.

Hind wing whitish cinereous, cilia white, with a fine pale brown line beyond base; underside the same. Underside of fore wing pale ochreous.

Six specimens, Baboquivaria Mountains, Pima County, Arizona, July 15-30, O. C. Poling; South Arizona, August 1-15, Poling; Oracle, Arizona, July 12, E. A. Schwartz.

Cotypes.—Cat. No. 11949, U.S.N.M., and in the Author's collection.

This species may prove to be a light form of *baboquivariella* Kearfott, basing the type of the latter upon the dark form from Huachuca Mountains. From this specimen the description was written. Since then I have obtained additional specimens of both sexes, which can undoubtedly be referred to *baboquivariella*. In these dark forms the white median streak is nearly obsolete, the white subterminal area is not distinctly defined, but the veins are slightly outlined with white. I shall therefore eliminate the four badly rubbed specimens received from Professor Snow, as cotypes of *baboquivariella*. I hope additional material in perfect condition will prove the correctness of these views.

MESOLIA BABOQUIVARIELLA (Kearfott).

Prionapteryx baboquivariella KEARFOTT, Can. Ent., XXXIX, 1907, p. 5.

Certain structural details omitted in the description should be recorded.

Male.—Antenna thickened and flattened; projection in termen of fore wing acute but hardly hooked. Venation fore wing: 4 absent; 6 from very near upper angle of cell; 7, 8, and 9 stalked; 10 and 11 from cell, free. Venation hind wing: 3 and 4+5 separate at base; 4 and 5 stalked two-thirds; 6 present from upper angle of cell; 7 and 8 coincident beyond cell, then separately to margins.

Female.—Venation same as male; antenna simple.

The structure places this species in the very closely related genus *Mesolia* Ragonet, and in section I, between divisions A and B, as defined by Hampson.^a

MESOLIA HUACHUCAELLA, new species.

Expanse, male, 15-16 mm; female, 17-20 mm.

Head grayish brown, white in front; palpi darker than head, ochreous internally; antenna flattened and broadened in male, simple in female, ochreous gray; thorax cream white, more or less shaded with ochreous brown, especially the anterior end; abdomen

^a Proc. Zool. Soc. Lond., 1895, pp. 962-963.

light ochreous brown, darker above on first three segments; legs white, tarsi banded with dark brown.

Fore wing dark grayish brown; under a lens this dark color is very mottled, as the bases of the scales are lighter, ochreous or whitish, than the tips. On and below the fold is a whitish streak, defined by an oblique dark streak on inner third and the dark brown of inner line at outer third. There is a distinct white spot on outer third of costa, between the inner and subterminal lines. The inner line is dark brown from outer third of costa, with two long and sharp outward angulations at upper and lower thirds; from the latter it sends a long line, dilated at end, to middle of dorsum; it is edged inwardly with white. The brown subterminal line from outer fifth is straight and almost runs into incision; below this it is not distinctly defined, but indicated by brown scales on the veins, giving a wavy appearance, to termen. The space between these lines is more white than elsewhere on the wing, but is dusted with brown, in some specimens heavily. The subterminal line is edged with white on upper third, beyond which is a broad olivaceous brown line, then a fine white line, followed by a darker brown triangular apical spot. Below incision, on termen, is an oblong white spot. Terminal line, before cilia, very narrow, brown. Cilia above incision white, divided by a blackish line near base and blackish outwardly; below incision grayish white.

Hind wing cinereous gray, cilia white, with a faintly darker line close to base; underside paler. Underside fore wing light gray, with white costal marks faintly repeated.

Eighteen specimens, Globe, Arizona, August 25, Kunzé; Phoenix, Arizona, August, Kunzé; Yuma County, Arizona, through J. B. Smith; Huachuca Mountains, Arizona, Poling; Nogales, Arizona, July 22, Oslar; Santa Catalina Mountains, Arizona, July 24-31, from U. S. National Museum; Albuquerque, New Mexico, July 21, Oslar; Oracle, Arizona, July 9, Schwarz; Mesilla Park, New Mexico, 3,800 feet, Cockerell; Baboquivaria Mountains, Pima County, Arizona, July 15-30, Poling.

Cotypes.—Cat. No. 11950, U.S.N.M., and the Author's collection.

This species is unlike any of our *Mesolia-Prionapteryx* group in the decided grayer hue of the fore wings; all the other species have a superficially ochreous or ochreous-brown tinge, and it can be easily separated by this character; the average size is also smaller.

ANALYTICAL KEY TO SPECIES OF PRIONAPTERYX.

- | | | |
|-----------------------------------------------------------------|------------------------------|---|
| 1. Fore wing with white cloud at inner third..... | <i>nebulifera</i> Stephens. | |
| Fore wing without this cloud..... | | 2 |
| 2. With sinuate transverse white line at base of fore wing..... | <i>serpentella</i> Kearfott. | |
| Without this character..... | | 3 |
| 3. With white dash on middle of termen..... | <i>achatina</i> Zeller. | |
| Without this white dash..... | <i>cuncoialis</i> Hulst. | |

PRIONAPTERYX SERPENTELLA, new species.

Expanse, 18–21 mm.

Head white, slightly speckled with brown, a brown spot in front; on top and behind it are two smaller ones; labial palpi, basal joint externally and basal and median joints internally white, outer half above, internally shaded with leaden fuscous; externally there is a black patch on basal joint (a small dot of same color behind it under eye): second joint narrowly white at base, then brown above, shading into leaden fuscous; maxillary palpi with a black spot at extreme base, another about middle of first joint, and a brown shade above and below the outer joint, internally white; antenna annulated white and dark brown; thorax white, heavily mottled with brown; abdomen ochreous white; there is a posterior dark brown streak on second segment; underside whitish with subventral brown line on middle segments; legs pale ochreous; tarsi banded with brown.

Fore wing dark chocolate brown, marked with pearly white. From the base below costa a sinuate line goes to inner fifth, curves under across fold, then proceeds obliquely to dorsum at inner third; there it curves upward and inward, ending at fold. At the base is a whitish dorsal patch which joins the inner end of this sinuate line. There is a broken middle transverse line, much angulated; the upper part starts beyond middle of costa, curves obliquely outward, and sends a very fine line outward to subterminal; in the middle of wing is a crescent-shaped mark which forms the middle section; this sends a fine inwardly oblique line to the outer part of the sinuate line. There is a white streak on outer fourth of costa and a dusting of white below it on lower half of wing. The terminal line is shining white; from the costa it is sharply oblique into the angle above the termen incision, thence as sharply oblique inward to under its starting point on costa, thence nearly straight to dorsum, with a slight angle at lower fifth; adjoining it outwardly is a broad triangular white patch in middle of wing and a small white patch at tornus; a triangular white apical streak is narrowly edged outwardly with brown. Above the incision the cilia is white at base, brown outwardly; below it is white at base, shading into gray externally.

Hind wing whitish gray, cilia white; underside the same. Underside fore wing light cinereous gray, with the dark and whitish spots in apex repeated.

Six specimens, Vernon and Sabine parishes, Louisiana, June and July, collected by George Coverdale; Coconut Grove, Florida, E. A. Schwarz, from National Museum collections.

Cotypes.—Cat. No. 11951, U.S.N.M., and the Author's collection.

The venation is the same as *P. nebulifera* Stephens, and the colors are alike in both species, but the markings are entirely different.

ANALYTICAL KEY TO SPECIES OF EUGROTEA.

1. Veins of outer third fore wing outlined in white.....*yavapai* Kearfott.
 Veins not outlined in white.....*dentella* Fernald.

EUGROTEA (?) YAVAPAI, new species.

Expanse, 19–22 mm.

Head whitish ochreous, speckled with brown; palpi whitish ochreous, shaded with brown externally and on top at base of apical joint; maxillary palpi shaded externally at outer end with light brown; antenna whitish ochreous, broadly annulated with brown, the latter speckled with whitish; thorax creamy ochreous, with whitish patches in middle and on patagia, somewhat speckled with brown, especially marginally and posteriorly; abdomen pale ochreous, darker on dorsal part of each segment; legs whitish ochreous, tarsi banded with brown.

Fore wing mottled white, ochreous and brown. The white occurs in the base, dorsally, in the fold; a transverse twice angulated line in middle of wing, a broad patch on costa before subterminal line; a small spot on costa at beginning of subterminal, a large spot in apex, and on termen between the veins; between 2 and 5, the spots are confluent; the white subterminal line is angulated outwardly to vein 6, then inwardly to dorsum before tornus. The ochreous shades are on inner half of costa, on upper and lower veins of cell, and in the dark patch before the subterminal line. The dark brown is dusted over the whole wing, except where the ochreous and white replace it; the most conspicuous marks are a prominent round spot over upper angle of cell; two or three horizontal short lines in the white patch on termen between 2 and 5; a costal spot between subterminal line and white apical spot, a similar one below it; a terminal line of brown is succeeded by a thin whitish line at the base of the shining leaden brown cilia.

Hind wing pale ochreous gray, cilia whitish. Underside both wings whitish, the fore wing mottled with pale ochreous.

Described from thirteen specimens; twelve from Yavapai County, Arizona, April, from J. B. Smith; one specimen, Colorado, New Mexico, at light, July 10, Cockerell, from National Museum collections.

Cotypes.—Cat. No. 11952, U.S.N.M., and in Author's collection.

There is some variety in the intensity of the colors. Some specimens have but little of the dark brown scaling, but there does not seem to be any variation in the arrangement of the markings.

I am in doubt where to place this species. As will be seen by fig. 4, the outline of fore wing and venation are very different from *nebulifera* Stephens, the type of genus *Prionapteryx*; it is nearer to *Surattha* Walker, differing in the simple antenna and in 6 and 7 of fore wing from a point, but owing to stalking of 4+5 of fore

wing. I prefer to place it under *Eugrotea* with a query. The principal points of structure are as follows:

Head with conical chitinous process in front; rather loosely scaled.

Antenna simple.

Labial palpi extends $2\frac{1}{2}$ times eye-width beyond head; second joint long tufted below, concealing the terminal joint.

Maxillary palpi nearly half length of labial; triangularly scaled.

Tongue moderate.

Ocelli present.

Thorax smoothly scaled.

Fore wing less than $2\frac{1}{2}$ times long as wide; costa straight, apex obtusely rounded, not produced; termen slightly rounded and lightly indented at end of vein 4, angle about 15° from vertical; dorsum slightly rounded. Venation: Veins 1^a and 1^c obsolete; 1^b not furcate

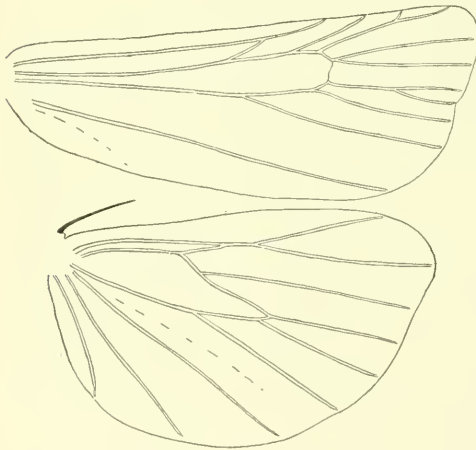


FIG. 4.—VENATION OF *EUGROTEA YAVAPAI*.

at base; 2 from outer fourth of cell; 3 from near end of cell; 4+5 long stalked; 6+7 short stalked or strongly connate; 7 out of 8 beyond middle; 10 free from before end of cell; 11 coincident with 12 for its outer two thirds.

Hind wing $1\frac{1}{3}$ as wide as fore wing; lower median vein hairy above; costa nearly straight, apex rounded, termen straight in middle of wing, rounding at torus. Venation: 1^{abc} present, 1^b not furcate

at base; 2 from outer third of cell; 3 from before lower angle; 4+5 coincident from angle; 6 from middle of cell; 7 and 8 coincident for a short distance beyond cell, former from upper angle.

CRAMBUS COCKLEELLUS, new species.

Expanse, 25–30 mm.

Head white, collar yellow; maxillary palpi white; labial palpi creamy white inside, dark coppery brown outside; antenna coppery gray, faintly annulated with white, shaded with white on basal segments; thorax white on middle, laterally and patagia coppery yellow; abdomen grayish fuscous, first three joints above and anal tuft shaded with ochreous brown; legs, femur, and tibia of front pair whitish, otherwise ochreous brown.

Fore wing coppery yellow; the silvery white stripe is very narrow, of about equal thickness throughout, with a slight spur below at inner third; outer end obtusely pointed and not quite reaching to subterminal line. The ground color above it is a little wider than stripe; costa not edged with white. On dorsal margin from base to subterminal line is a white line of half the width of median stripe, edged above with dark scales. There is a narrow white streak on costa at outer fourth, before the subterminal line; the latter begins at outer fifth, goes slightly obliquely outward to upper third, then obliquely inward to dorsum, it is shining white; beyond it on costa is a small triangular, inwardly oblique white patch, duplicated below apex, leaving a ground color spot in apex. The lower two-thirds of margin is white, inwardly dotted with brown and with a marginal row of five black dots on veins 2 to 6. Radiating from the median stripe, the veins are overlaid with silvery gray; these radiations do not extend beyond end of stripe, leaving a broad ground color band before the subterminal line. Cilia pearly gray, white at base of upper third.

Hind wing light gray, cilia whitish; underside the same. Underside fore wing dark gray, ochreous on costa, a terminal row of black dots.

Three specimens, Bear Lake and Jacksons Creek, near Kaslo, British Columbia, August 10-11, collected by J. W. Cockle, and in whose honor it is named.

Type in Author's collection, paratype in Cockle collection.

Probably closer to *C. dumetellus* Hübner than any other species known from North America.

CRAMBUS TRICHUSALIS Hulst.

Crambus trichusalis HULST, Trans. Amer. Ent. Soc., XIII, 1886, p. 165.

Crambus dumetellus FERNALD, Spl. Bull. Mass. Agri. Coll., 1896, p. 33.

Expanse, 24-27 mm.

Head white, faintly gray in front; labial palpi white internally, shining gray outside; maxillary palpi white, gray at base; antenna ochreous gray, basal joints shaded with white; abdomen white, shining ochreous gray laterally and on patagia, collar behind eyes, ochreous; abdomen white, shaded with ochreous above on first four segments; legs light ochreous.

Fore wing yellowish gray. The median silvery white stripe is narrow, running out to a fine point nearly touching subterminal line; a short spur at inner third sends a short white line into fold; the stripe below for inner third is edged with ochreous. Below the costa is a white line from base to middle; above it the costa is edged with dark gray. The subterminal line is silvery white; the angle

is below upper third; before and behind it on costa are large triangular white streaks; on each side of the mottled gray and brown apical spots are smaller white spots. Below the angle of the subterminal line the margin is white, outwardly marked with a row of four or five black dots. Dorsal edge narrowly white; beyond the middle the extreme edge is gray, below the white line. Beyond end of cell the veins are overlaid with silvery white, but not extending to subterminal line. Cilia pearly gray, white at base.

Hind wing whitish gray, darker along costa and in apex, underside the same. Underside fore wing dark gray, termen white, veins dotted with black.

Four specimens, High Bridge, Alberta (Thos. Baird), Regina, July 24, all received from Mr. T. N. Willing; Redvers, Saskatchewan, A. J. Croker.

Homotype in Author's collection.

I had the foregoing description written, under a new name, when a visit to the Hulst collection at New Brunswick showed that my supposed new species was *trichusalis*. Hulst's type is in excellent condition, and I hardly see how it could have been made a synonym of *dumetellus* Hübner. The median silver line of the latter ends at outer third; beyond it and below it is an elongated silver spot; in *trichusalis* the silver streak extends in a continuous line, nearly touching the subterminal line, at the outer sixth or seventh of the wing. I have no European specimens of *dumetellus*, but the figures in both British Pyralides by Leech, 1886, and Lepidoptera of the British Islands by Barrett, 1905, show this character. It is also shown in Fernald's fig. 2, Pl. III, Crambidae of North America. I feel entirely safe in restoring Hulst's name to specific rank.^a

CRAMBUS YOUNGELLUS, new species.

Expanse, 17-18.5 mm.

Palpi, head, and thorax white, labial palpi on exterior surface, maxillary palpi at base, and patagia shaded with ochreous brown; antenna grayish white, abdomen white, with a slight yellowish tinge, anal tuft darker; legs white, dusted and banded with brown.

Fore wing bright ochreous brown, a darker shade along costal edge. The usual silvery white stripe is very broad to middle of wing. To this point its lower edge is bounded by the fold, and from which it angles from both upper and lower edges to a point ending midway between veins 5 and 6 and one-third the distance from end of cell to termen. On the inner half of wing the costa is dark gray brown, in

^a Since the above was written I have received a long series of European specimens of *dumetellus*, and they fully confirm this opinion; in fact, I have seen no specimens from North America which could possibly be referred to this species, and believe it should be stricken from our lists.

a narrow line, about one-fourth the width of the silver stripe. At the lower angle of stripe there is a very slight tooth. Beyond the stripe in middle of wing is a short silvery white streak, outwardly touching the angle of the subterminal line and inwardly slightly underlapping the end of the silvery stripe. On costa before subterminal line is a long, narrow, triangular, outwardly oblique white mark, and beyond the line a much smaller white costal dash. The subterminal line starts from outer fifth on costa, angles obliquely outward to upper third, then parallels termen to dorsum; it is shining grayish white, outlined inwardly by a clear brown line; above the angle is a light ochreous brown triangular spot in apical space; below the angle the subterminal is bounded outwardly by a line or shade of mottled white and grayish brown. The terminal line is black, above the angle solid, below the angle divided into four or five black dots, the latter are ground color in the interspaces; in the upper third this black line is bordered on both sides by a vertical white line, on the outer side overrunning the cilia. On the outer third of wing the veins are overlaid with shining gray, more or less outlined with scattered black scales. The dorsal edge is narrowly silvery white from base to tornus; the outer half is edged above with scattered black scales. Cilia iridescent pearly white.

Hind wing light gray, cilia paler; underside the same shade below middle, above and under side fore wing darker gray.

Described from ten specimens, Mer Bleue, Ontario, July 2-10, collected by C. H. Young, whose name it is a great pleasure to honor.

"Mer Bleue" is a huge sphagnum swamp about 20 miles south of Ottawa. This species is nearer to *bidens* Zeller than any other North American form known to me; it is slightly smaller, but of the same dainty appearance; it can be readily separated by the white streak between stripe and termen. In this respect it is nearer *pascuellus* Linnaeus.

Cotypes.—Cat. No. 12060, U.S.N.M., Mr. Young's and the Author's collections.

CRAMBUS BIDENS Zeller.

Mr. Young was successful in collecting a large series of this rare species near Ottawa about the middle of July, including many females, which possess a peculiarity that I have not seen recorded. In this sex the broad white stripe is suffused on the upper half with brown; this suffusion does not extend to the upper edge, which is narrowly silvery. I have also captured this species in a piece of bogland in the pine barren district of New Jersey, near Lacy, about the middle of the State, about 10 miles from the ocean. Curiously the same species of orchid were growing in this spot as I observed a year before in the sphagnum swamp at Mer Bleue. None of the Lacy specimens showed this suffusion.

Aweme, Manitoba, is another locality for this species, collected by Mr. Criddle August 9.

CRAMBUS POLINGI, new species.

Expanse, 16-19 mm.

Head and palpi white, labial externally and maxillary palpi at base shaded with grayish brown; antenna cinereous; thorax shining white with a yellowish gray hue; abdomen whitish brown; legs white, lightly shaded with brown.

Fore wing white, thickly speckled with light purplish brown; above the cell the dark scales have a cinereous tinge and are closer together, forming a stripe on the inner two-thirds; between this and fold the dark scales are almost absent. Median line is indicated by an outwardly oblique dash from costa at outer third, a horizontal dash before it on fold, and below this a small dot on dorsal margin. The subterminal line from outer sixth of costa is white, bounded on each side by purplish brown lines; the outer one merges into a spot on costa before apex; this line curves outwardly to vein 7, then parallels termen; between each two veins it is inwardly rounded. Between it and the dark purple terminal line is a broader whitish line. Cilia shining yellowish cinereous.

Hind wing pale ochreous, underside whiter; underside fore wing same shade, but darker.

Described from fifteen specimens, South Arizona, August 1-15, collected by O. C. Poling.

In shape, size, and general appearance this species is very close to *elegans* Clemens, but the markings are very distinct; the easiest one by which to separate them is the subterminal line, which in this species is beautifully and evenly corrugated its entire length, these corrugations affecting the paralleling lines in the termen; the marginal row of black dots of *elegans* is entirely absent in this species.

Cotype.—Cat. No. 11953, U.S.N.M., and in Author's collection.

CRAMBUS INTERMEDIUS, new species.

Expanse, 16-20 mm.

Head and thorax whitish ochreous, patagia darker; labial palpi short and pendant, whitish ochreous internally, shaded with gray externally; maxillary palpi same as head; antenna light ochreous; abdomen light cinereous, ochreous above on first three segments; legs whitish, powdered with ochreous.

Fore wing dark ochreous above the median white streak, light ochreous below it and on outer third. The median white streak is narrow and extends from base, through lower half of cell to beyond end of cell, where it is lost in the whitish ochreous shade of outer third; its lower edge follows the lower vein of cell; it gradually

widens, upwardly, from base to inner third, then diminishes to middle; beyond it is a fine line. There is a dark brown, broken, terminal line; before it on the costa is a short parallel white dash. The subterminal line is nearly obsolete, on some specimens; there is a shining whitish line from dorsum, at outer sixth, to middle of wing, paralleling the termen. The light ochreous shade of the outer third gradually becomes whitish at termen and the cilia is the same shade, whitish ochreous.

Hind wing, male, white; female, whitish gray; underside white. Underside fore wing ochreous white.

Four specimens, labeled "Arizona." One from Professor Fernald's collection is labeled "*Crambus intermedius* Ragonot—86, yellow label 122." This MSS. name of Ragonot's I am glad to give to the species. In size and median stripe it is close to *hemiochrellus* Zeller and *haytiellus* Zinek. I have four other specimens from Burnet County, Texas, March and April (F. G. Schaupp), which are slightly smaller and much darker, and in which the subterminal line is complete to costa, the area beyond it being heavily sprinkled with white on an ochreous brown ground color, which I believe are darker varieties of this same species, and have so labeled them in my collection.

Cotype.—Cat. No. 11955, U.S.N.M., and in Author's collection.

CRAMBUS DORSIPUNCTELLUS, new species.

Expanse, 24–28 mm.

Head and thorax and palpi light ochreous, latter darker externally; antenna fuscous in front, dusted with light ochreous elsewhere; abdomen grayish ochreous; legs light ochreous.

Fore wing above the fold, light fawn ochreous; below fold, light fawn; the dorsal margin below fold is sparsely dusted with brown; a very few of these dark dots occur in middle of wing in outer half of cell and below lower angle of cell. There is barely a trace of a subterminal line in one specimen; a very faint deeper ochreous line crosses the outer end of fold on the lower third of wing. On the termen, at end of veins 2 to 5, is a small brown dot; above them is a nearly obsolete darker terminal line. Termen is edged with a shining grayish yellow line, the cilia beyond of the same shade, but less shining.

Hind wing smoky gray; cilia, except at apex, whitish gray; under side lighter. Under side fore wing dark ochreous gray.

Described from four specimens, Rounthwaite, Manitoba, July, L. E. Marmont; Verdi, Nevada, June 20–30, A. H. Vachell.

Types in Author's collection.

This species is close to *viricollis* Zeller and *vulgivagellus* Clemens. It can be separated from either by the practical absence of all markings and by the much lighter shining line at base of cilia of fore

wing; it is probably closer to *laciniellus* Grote, but lacks the white terminal line of that species and also has much darker hind wings.

CRAMBUS NEVADELLUS, new species.

Expanse, 17-26 mm.

Head pale ochreous; labial and maxillary palpi dark ochreous, paler internally; antenna ochreous brown; thorax pale ochreous, darker laterally; abdomen pale ochreous, first three segments shaded above with darker ochreous; legs whitish ochreous, shaded with light brown.

Fore wing light ochreous brown, darkest on upper half, gradually shading into whitish ochreous on outer third; below the fold the wing is streaked and mottled with white, especially on outer two-thirds, except over vein 1^b, which is brown; on the fold is a dotted line of white; between the fold and 1^b the whitish shade is dotted with a darker brown in a line paralleling the fold; over vein 2, half way between end of cell and termen, is an irregular dark brown line, preceded by a white patch; vein 3 is similarly marked. In the majority of specimens before me these white and dark brown scales on lower half are absent, partly obsolete, doubtless from their transient character. The brown subterminal line is curved outwardly from costa to below middle, then obliquely inward to dorsal margin; it also is more or less obsolete in some specimens. There is a more or less distinct dotted dark line preceding the cilia. The latter is whitish at base and pale ochreous outwardly.

Hind wings above and below light gray, cilia paler. Underside fore wings dark grayish ochreous.

The majority of the specimens are rubbed and present a different appearance from the above description. Color, both above and below middle, pale ochreous, a dark brown median streak from base to end of cell, broken at middle of wing by ground color. Other marks, except the subterminal line, are almost obsolete.

Thirty specimens, Verdi, Nevada, June 10-30, Sierra Nevada Mountains, on border line between California and Nevada, collected by A. H. Vachell.

Nearest to *trisectus* Walker and *albolineellus* Fernald, differing from both by the narrowness of the fore wing.

Cotype.—Cat. No. 11954, U.S.N.M., and in Author's collection.

CRAMBUS SIMPLICIELLUS, new species.

Expanse, 23-31 mm.

Head, thorax, and fore wing, light ochreous gray; both pairs of palpi are white internally, speckled ochreous gray outside; antenna ochreous brown in front, frosted with white elsewhere; abdomen

shining ochreous fuscous, browner on upper side of first three segments; legs white, anterior pair heavily dusted with brown in front.

The fore wing is almost unicolorous, a light ochreous gray or mouse color, with an ochreous tinge. It is somewhat darker on upper third and inner half; the entire inner two-thirds are more ochreous than the outer third, which is an ashy gray, but these shades merge into each other so gradually, and are really so nearly alike, that the wing presents almost a single tone. The inner and subterminal lines are slightly paler, but very faint, the subterminal, from outer sixth of costa, is convex to below middle, then an outward convexity on lower third of wing. There is a faint, darker, broken line before the cilia, which are only slightly shining of a pale leaden hue.

Hind wing dark smoky gray, cilia shining; underside paler. Underside fore wing smoky gray, cilia whitish at base.

Type.—In Author's collection. From Denver, Colorado, May 2, 1904, E. J. Osler: eight paratypes, Essex County, New Jersey, June 11; Georgia (from Strecker collection), Washington County, Arkansas, July–August, A. J. Brown. The specimens labeled "paratype" are included with some hesitation, and may prove to be a different species.

This is closest to var. *ulva* Cockerell, differing from it in the absence of the strong reddish and purple shades.

Genus EUFERNALDIA Hulst.

Eufernaldia argenteonervella HULST, Jour. N. Y. Ent. Soc., VIII, 1900, p. 224.

The type and only species was described from one female. I have recently received a series of both sexes from E. J. Osler, collected in the Huachuca Mountains, Arizona, August 15–29; also Prescott, Arizona, Dr. R. E. Kunzé, July 7, and Stockton, Utah, September 10, Tom Spalding. From the last locality the fore wings are a deep ochreous brown and the hind wings dark smoky brown. The Arizona specimens agree with Hulst's description, fore wings light ochreous,



FIG. 5.—VENATION OF EUFERNALDIA ARGENTEONERVELLA.

hind wings silvery white; the outlining of the veins in silver is the same in both forms and makes this species easily recognized. As the venation and head parts have not before been figured, I include them with a few corrections or additions to the original description.

In one of my specimens the maxillary palpi is sharply triangular in outline, less so in the others, but due, I think, to loss of scales. Antenna of male finely pubescent on front side. Venation: Fore



FIG. 6.—HEAD OF EUFERNALDIA ARGENTEONERVELLA.

wing, 3 is absent (coincident with 4) in all my specimens; 7, 8, and 9 are variable; in some 8 and 9 are coincident, and both 7 and 8+9 are to termen; in others 9 is present as a spur from 8 half way between the stalk and apex, and both 8 and 9 go to costa, 7 to termen; this does not seem to be a sexual variation. Hind wing, 3 and 4 are not from a point, but well separated at their bases; 7 and 8 are coincident from shortly beyond upper angle half way to end of 8.

Type.—*Eufernaldia argenteonervella* Hulst.

Superficially, this species reminds me of certain species of the Phycitinae.

ANALYTICAL KEY TO SPECIES OF THAUMATOPSIS.

1. Male antenna crenulate.....	<i>crenulatella</i> Kearfott.	2
Male antenna not crenulate.....		2
2. Male antenna unipectinate.....		3
Male antenna bipectinate.....		8
3. Fore wing whitish gray.....	<i>repanda</i> Grote.	4
Fore wing ochreous or brown.....		4
4. Fore wing chocolate brown.....		5
Fore wing light ochreous or whitish brown.....		6
5. White median streak to termen.....	<i>pectinifer</i> Zeller.	
White median line ending at about outer third.....	<i>striatella</i> Fernald.	
6. Subterminal and inner lines nearly obsolete.....	<i>atomosella</i> Kearfott.	
These lines well developed.....		7
7. Fore wing bright ochreous.....	<i>fernaldella</i> Kearfott.	
Fore wing whitish brown.....	<i>nortella</i> Kearfott.	
8. Veins fore wing overlaid with white.....	<i>magnifica</i> Fernald.	
Veins not overlaid with white.....		9
9. Median streak white.....	<i>edonis</i> Grote.	
Median streak not white.....		10
10. Cross lines obsolete.....	<i>gibsonella</i> Kearfott.	
Cross lines distinct.....		11
11. Fore wing whitish brown.....	<i>coloradella</i> Kearfott.	
Fore wing pale ochreous.....	<i>perrella</i> Zeller.	

THAUMATOPSIS COLORADELLA, new species.

Expanse, 26–32 mm.

Male antenna bipectinate, branches ciliated; stalk white, narrowly annulated with brown; branches black, cilia whitish. Labial palpi six times longer than width of eye, rather loosely scaled, fuscous gray, tips of scales creamy white; maxillary palpi loosely scaled,

cream white, lightly speckled with fuscous on the outside. Head and thorax light ochreous brown, heavily speckled with fuscous, internal edges of patagia and posterior ends of same whitish. Abdomen light ochreous brown, banded above with fuscous and brown on anterior segments and blackish on posterior segments. Legs cream white, heavily dusted with light fuscous.

Fore wing creamy ochreous, strongly marked with distinct dark brown lines. There is a narrow whitish line through middle of cell from base to end of cell; its outer half is bounded above by a thicker dark brown line; below is a similar but less distinct line from beyond base nearly to end of cell. From apex a strong well-defined line goes to dorsum at outer fourth; it is 45° oblique from apex to upper fourth, then is slightly convex outwardly to lower fourth, where there is a shallow outward pointing tooth. In the middle of lower half is an obscure oblique brown line which points toward end of cell. There is a faint brown streak from end of cell to terminal line below apex, which is a continuation of the brown line above the white median line. The lower half of wing and outer half are more or less dusted with light brown and there is a rather heavily brown scaling at base of dorsal margin. Cilia whitish, speckled with light brown.

Hind wing light grayish fuscous, cilia paler underside the same. Underside fore wing a shade darker than hind wing.

Eight specimens, Pueblo, Colorado, September 24, H. N. Nash; Durango and Denver, Colorado, May, E. J. Osler; San Luis Obispo, California, February and March, Arthur H. Vachell.

Cotype.—Cat. No. 11957, U.S.N.M., and in Author's collection.

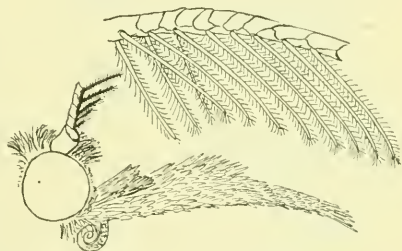


FIG 7.—HEAD AND ENLARGED ANTENNA OF
THAUMATOPSIS COLORADELLA.

THAUMATOPSIS GIBSONELLA, new species.

Expanse, male, 26–28 mm; female, 27–31 mm.

Male antenna bipectinated, with branches six to seven times width of stalk, each branch shortly ciliated on each side. Female antenna simple. Labial palpi with rather closely appressed scales on sides, with longer, looser scales on top; porrect, about four times width of eye; maxillary palpi rather loosely scaled, about as long as width of eye. Tongue long, upper end thickly scaled. Face and head light ochreous brown, labial palpi heavily dusted with dark brown, outer joint with grayish brown; maxillary palpi pale light ochreous

at base, tips of scales shaded with gray brown. Antenna, stalk cream fawn, annulated with light brown, branches black, cilia whitish gray. Thorax light fawn, speckled with brown, shading into a whitish posterior patch. Abdomen pale fawn, ringed above with brown on four anterior segments and with dark gray on three posterior segments. Legs pale fawn, finely dusted with brown.

Male fore wing, pale fawn, heavily dusted with brown; the ground color below costa on inner third of wing and over upper and lower median veins is of an ochreous shade. Terminal line nearly obsolete, only showing faintly in one specimen; it is outwardly concave opposite end of cell and sharply dentate above dorsal margin. One specimen has a thin, straight white line through middle of cell; this specimen is of a general darker grayish brown shade, and quite heavily overlaid with white scales on the dorsal margin and outer half of wing. The subterminal line is only faintly indicated by a few darker scales on dorsal half. There is a black dot at end of each vein in termen. Cilia brownish gray, divided by a pale line.

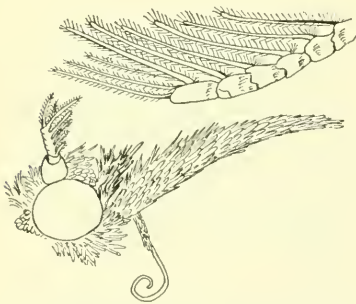


FIG. 8.—HEAD AND ENLARGED ANTENNA OF *THAUMATOPSIS GIBSONELLA*

Hind wing pale fuscous gray, slightly darker before termen and apex. Cilia whitish, preceded by a darker line; underside the same. Underside fore wing brownish gray.

Described from fourteen males and two females collected at Rostrevor, Ontario, Canada, September 2-16, by Mr. Arthur Gibson, in whose honor the species is named.

The females are of a much lighter color than the males, caused by the absence of the heavy fuscous brown sprinkling. The fore wings are also more elongate and rounded at the apex and anal angle than the male; the female hind wing is whiter.

Cotype.—Cat. No. 11958, U.S.N.M., Mr. Gibson's and the Author's collections.

THAUMATOPSIS ATOMOSELLA, new species.

Expanse, 27-30 mm.

Male antenna, unipectinate, branches four to five times width of stalk, shortly ciliated on each side of branches. Labial palpi slender, scales closely appressed, about six times as long as width of eye; terminal joint drooping. Head light ochreous cream color, thorax a whiter shade; stalk of antenna white, branches dark fuscous brown, cilia whitish; labial palpi cream ochreous, thickly speckled with dark fuscous and lightly sprinkled with white; maxillary palpi cream

color, with the long scales tipped with fuscous. Abdomen cream ochreous, slightly darker on top of each segment. Legs paler.

Fore wing pale creamy ochreous, or creamy white terra-cotta; there is a dull white, narrow band from base, over lower vein of cell nearly to termen; before middle of wing it begins to increase in width, so that at outer end it covers all space between veins 2 and 7; the lower part and outer end are overlaid with whitish fuscous; all of the dorsal margin to above the fold is of the same shade. These two whitish streaks are separated by a clear line of ground color; the median white streak is outlined on both sides by blackish brown dots and a line of the same limit the upper edge of the dorsal white shade. Both of the white shades are interrupted by the subterminal line, which is ground color; it cuts through the median at the end of cell and the dorsal before the middle of wing. There is a broad band of ground color before termen, divided by a parallel terminal line of shining whitish scales thickly dotted with brownish fuscous. At the end of each vein, in the middle of termen, is a tiny black dot. Cilia narrowly white at base, followed by a narrow fuscous line, then by a shining whitish line; beyond it is white, thickly sprinkled with light brownish fuscous; extreme tips of scales white.

Hind wing light fuscous, with a trace of a darker line before the cilia; cilia white, divided by a darker line near base; underside the same. Underside fore wing darker fuscous, finely atomized with paler specks; the lines of the cilia are repeated from above.

Two specimens, Phoenix, Arizona, April and May, collected by Dr. R. E. Kunzé.

Type.—In Author's collection.

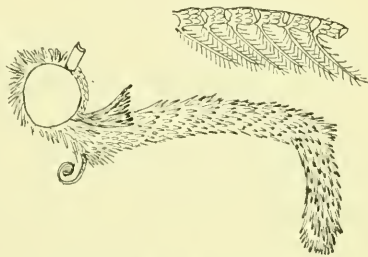


FIG. 9.—HEAD AND ENLARGED ANTENNA OF *THAUMATOPSIS ATOMOSELLA*.

THAUMATOPSIS CRENULATELLA, new species.

Expanse, 30 mm.

Male antenna crenulate, the teeth being $1\frac{1}{2}$ times thickness of stalk; the teeth are thickly ciliated on their upper sides and outer ends, the internal cilia arising from raised processes or warts. Labial palpi rather smoothly clothed, length about four times the width of eye; maxillary palpi loosely scaled, about as long as width of eye. Head, thorax, and palpi white, heavily dusted with brownish fuscous. Antenna, stalk and cilia whitish fuscous, teeth black. Abdomen whitish

fuscous, banded above with blackish on posterior segments. Legs creamy ochreous, anterior pair heavily dusted with fuscous.

Fore wing white, overlaid with fuscous and blackish brown. The white occurs as follows: A broad median streak from base to end of cell, a fine line on fold, and a dusting on dorsal margin below fold; all veins on outer half of wing overlaid in white; between veins 5 and 8 the white predominates; at the termen the white forms a continuous band. The fuscous occurs along costa, between median white band and fold, below fold and between veins in outer half of wing. The blackish brown occurs only as fine lines, outlining vein 1^b , all veins between end of cell and termen, and is rather heavier between end of cell and apex than elsewhere.

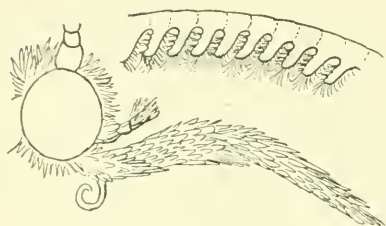


FIG. 10.—HEAD AND ENLARGED ANTENNA OF THAUMTOPSIA CRENULATA.

The terminal line is ochreous fuscous; it is close to termen, and is sharply angled below costa and dentate at lower end. The subterminal line is of the same color, but somewhat obscure; it follows end of cell, then sharply angles outward halfway to termen in a tooth-shaped process, the lower half of which runs backward to inner third of dorsal margin; it is lightly outlined with white on both sides. The terminal line is outwardly edged with a row of dark brown dots. The cilia is shining leaden, cut by white on the upper half. Preceding the cilia is a line of black dots and lines; between the veins there are four short lines on upper half of wing, three dots below them, and a nearly continuous line of tornus.

Hind wing light fuscous, with a fine darker marginal line, which at apex is preceded by a few whitish scales; cilia white, divided by a pale fuscous line at base. Underside both wings grayish fuscous; both are margined outwardly with white, with the marginal and ante-ciliate lines and dots repeated.

One male specimen, from Baboquivaria Mountains, Pima County, Arizona, latter part of July, 1903, collected by Mr. O. C. Poling.

Type.—In Author's collection.

This species is remarkably like *T. repanda* Grote, and the only way to distinguish them is by the difference in the male antennae, an enlargement of both, with head structure, is shown by figs. 10 and 11.

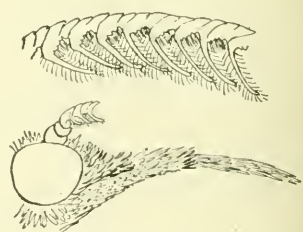


FIG. 11.—HEAD AND ENLARGED ANTENNA OF THAUMTOPSIA REPANDA.

I have another specimen of *repanda* from Pima County, Arizona, received from Dr. John B. Smith, which is marked and colored exactly like my type, except that the dark shadings are a little more intense. These two are so exactly alike in every detail, except the form of their antennæ, that I am rather inclined to doubt the stability of the latter. Extensive series may show sufficient intermediate variation to sink the new name as a synonym of *repanda*.

THAUMATOPSIS PEXELLA Zeller.

A drawing of the head structure, with an enlargement of the antenna is given in fig. 10 for comparison with similar parts of other species in this genus.

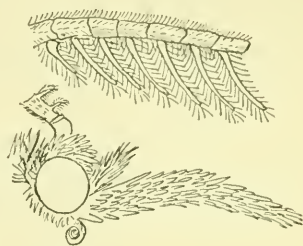


FIG. 12.—HEAD AND ENLARGED ANTENNA OF *THAUMATOPSIS PEXELLA*.

ANALYTICAL KEY TO SPECIES OF DIATRÆA.

1. Fore wing with a silver median stripe.....*parallela* Kearfott.
Fore wing without silver median stripe..... 2
2. Fore wing bluish gray, without marks or dots.....*idalis* Fernald.
Fore wing yellow or brown..... 3
3. Fore wing with dorsal white shading.....*allenii* Fernald.
Fore wing without this distinct shade..... 4
4. Fore wing with duplicated subterminal line.....*saccharalis* Fabricius.
Without these lines, expanse over 40 mm.....*differentialis* Fernald.

DIATRÆA PARALLELA, new species.

Expanse, 22–30 mm.

Head white, slightly shaded with cream between antennæ; labial palpi white internally, beyond middle dotted with gray, externally heavily dotted with gray and brown; maxillary palpi white, with external patches of gray scales at base of second joint and at outer end of tuft; thorax white, with short indistinct subdorsal ochreous streaks; patagia light fawn, becoming whitish at posterior ends and dorsally edged with white; abdomen and legs cream white, latter slightly shaded with light ochreous.

Fore wing pale fawn or light ochreous terra-cotta. This ground color is uniform throughout the wing and makes a very effective background for the silver stripes. The median stripe is from base to termen, of uniform thickness except on inner fourth, where it gradually diminishes in width to base; above it is a ground color stripe of equal width; above this the costa is narrowly white from base to apex; veins 2, 3, 4, and 7 are overlaid with white at termen. The dorsal margin is narrowly white and vein 1^b is overlaid with white its

entire length. The median stripe is outlined with scattered black dots. These dots are entirely absent from the costal stripe, but on all other white lines the black dots are sprinkled sparsely over the white; on veins 2, 3, and 4 the black dots follow the veins to cell. There is no trace of a subterminal line, and all of the white stripes extend directly to the terminal line, which is cream white, edged on either side with a fine brown line; beyond this the cilia is white at base and outwardly speckled with gray and brown.

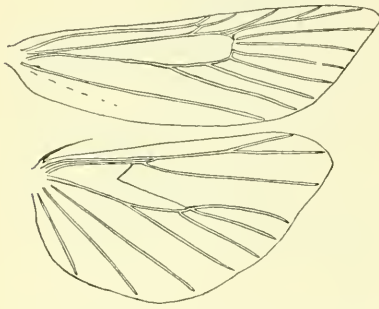


FIG. 13.—VENATION OF DIATREA PARALLELA.

Hind wing above cream white, lightly speckled outwardly with pale brown; underside white. Underside fore wing pale ochreous lightly dusted with pale brown.

Described from twenty-three specimens from Almagordo, New Mexico, April 19 to May 5, collected by H. L. Vierick and J. A. G. Rhen.

Cotypes.—Cat. No. 11959, U.S.N.M., in collection of Philadelphia Entomological Society, and in Author's collection.

The venation of this species, as shown by fig. 5, agrees better with Fernald's figure of *D. saccharalis* Fabricius^a than with Hampson's figure of *saccharalis*.^b The majority of Hampson's palpal figures in this revision are misleading, as they show the terminal joint as though it were differently scaled than the median joint. This is scarcely ever the case in the Crambinae. The long overlapping scales of the median joint entirely hide the junction with the apical and usually the same scaling extends to the apex. These characters in this species are shown by fig. 14.

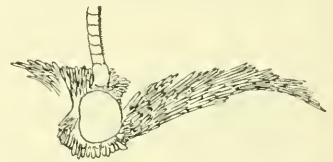


FIG. 14.—HEAD AND PALPI OF DIATREA PARALLELA.

ANALYTICAL KEY TO SPECIES OF CHILO.^c

- | | |
|-------------------------------------------------------------|------------------------------|
| 1. Fore wing with metallic cilia..... | 2 |
| Fore wing without metallic cilia..... | 3 |
| 2. Fore wing with inner and subterminal lines well defined. | |
| With these lines not distinct..... | <i>placidellus</i> Hainbach. |
| With these lines distinct..... | <i>plejadellus</i> Zinck. |
| 3. Fore wing with veins outlined in brown..... | <i>densellus</i> Zeller. |
| Fore wing with veins not outlined in brown..... | 4 |

^a The Crambidae of North America, Plate C, figs. 10, 11, 12.

^b Proc. Zool. Soc. London, 1895, p. 953.

^c *Crambus inornatellus* Walker, included in *Chilo* in Smith's list, 1903, No. 4983, is retained by Hampson in *Crambus*.

- | | |
|----------------------------------------------------------------------------------------------------|----------------------------------|
| 4. Fore wing ground color white..... | 5 |
| Fore wing ground color brown..... | 7 |
| 5. Fore wing with complete inner and subterminal lines... <i>squamulellus</i> Zeller. ^a | |
| No lines on fore wing..... | 6 |
| 6. Fore wing almost immaculate, over 30 mm. expanse... <i>puritellus</i> Kearfott. | |
| Fore wing speckled with brown, under 25 mm. expanse. | |
| | <i>multipunctellus</i> Kearfott. |
| 7. Hind wing dark fuscous..... | <i>comptulatalis</i> Hulst. |
| Hind wing principally white..... | <i>forbesellus</i> Fernald. |

CHILO MULTIPUNCTELLUS, new species.

Expanse, 20–24 mm.

Head, palpi, thorax, and fore wing white, with a very faint yellowish tinge, palpi externally dusted with brown; abdomen more strongly shaded with yellowish gray above.

The fore wing is finely speckled with brown all over, roughly arranged in horizontal lines on and between the veins, not visible except through a lens. Before the white cilia is a fine brown line.

Hind wing above and below white. Underside fore wing cinereous white.

Eleven specimens, Oracle, Arizona, June 10, E. J. Oslar; southern Arizona, Poling; Huachuca Mountains, Arizona, Poling; Chiricahua Mountains, Arizona, July 4, H. G. Hubbard.

The venation agrees with Fernald's figure of this genus in his revision of the Crambidae.

Cotype.—Cat. No. 11960, U.S.N.M., and in Author's collection.

CHILO PURITELLUS, new species.

Expanse, 31–35 mm.

Head, palpi, thorax, fore wings above and hind wings above and beneath white, with a faint ochreous tinge. Upper side of abdomen lightly shaded with ochreous.

The fore wings are sparsely and microscopically dusted with whitish fuscous. Underside white, with a grayish hue.

One male and one female, Baboquivaria Mountains, Pima County, Arizona, July 15–30; Huachuca Mountains, Arizona, both from O. C. Poling.

Type.—In Author's collection.

This species may be a large race of *multipunctellus* Kearfott, but I am inclined to think it is distinct. Its large size is sufficient to separate it, at least until additional collecting in these regions turn up a series showing intermediate sizes.

Besides the above, I have six species of *Diatraea* and three of *Chilo* undescribed in my collections, but await longer series before making them known.

^a Hampson, Proc. Zool. Soc. Lond., 1895, 946, places this species under *Platytes* Guenee (*Argyria* Hübner). As I have no specimens for examination of structure, I prefer to let it remain in this genus, according to Fernald's revision.