

**Article XXXI.**—A REVIEW OF THE SPECIES COMPRISING THE  
*GLAUCINA-CÆNOCHARIS* GROUP.

BY JOHN A. GROSSBECK.

The species which I have here collectively called, for convenience, the *Glaucina-Cænocharis* group do not comprise a compact and homogeneous assemblage. The name might appropriately be applied only to the first three genera considered, which, however, contain most of the species. The others are more or less distantly related but are more nearly so to *Glaucina* and *Cænocharis* than to any other genera. However, as a whole, where the species do not agree in the curious frontal protuberance, they do agree in the elongated wings. All the species with the exception of *Exelis pyrolaria* and two species of the genus *Tornos*, namely *scolopacinaria* and *cinctarius*, which occur chiefly in the southeast, are confined to the more arid regions of the Southwest—Colorado, Utah, Nevada, New Mexico, Arizona, southern California and the western extension of Texas.

It was the intention of the author in commencing the revision of this group of genera to carefully monograph the entire series, and for this reason material was sought from all available sources. The net result was the accumulation of over five hundred specimens of these insects which as a rule are rare in collections. Unfortunately the condition of the specimens was on the whole unsatisfactory; and the further fact that many new species represented by only a few, frequently poor, specimens, were among the material rendered the task impracticable.

For the loan of specimens I have to thank Dr. Wm. Barnes of Decatur, Illinois, Mr. R. F. Pearsall, of Brooklyn, N. Y., Mr. Geo. H. Field, of San Diego, California and Mr. Jacob Doll of the Brooklyn Institute Museum. To Dr. H. G. Dyar of the United States National Museum, likewise, my thanks are due for having kindly compared specimens for me with types in the National Museum.

*Table for the separation of the genera considered in this paper.*

Posterior tibia with only one pair of spurs

Front strongly tubercled, costa of primaries arched, the anal angle rounded  
*Synglochis*.

Front smooth, costa of primaries straight or slightly concave, anal angle pronounced  
*Holochroa*.

## Posterior tibia with two pairs of spurs

## Front tubercled or strongly produced

## Costa of primaries straight or almost so, anal angle pronounced

Wings rather short and broad, palpi short . . . *Morina*.Wings long, palpi long and slender . . . *Stenocharis*.

## Costa of primaries arched, anal angle not pronounced

Anterior tibia armed with a claw . . . *Glaucina*.Anterior tibia unarmed . . . *Cænocharis*.

## Front smooth, not produced

Discal spot composed of long, erect scales, male antennæ bipectinate,  
female antennæ simple . . . *Tornos*.Discal spot not noticeably raised above level of rest of wing, male and  
female antennæ bipectinate . . . *Exelis*.

*Glaucina* and *Cænocharis* are structurally alike except for the claw on the anterior tibia of the former. The type of *Glaucina* is *escaria* Grt. and of *Cænocharis*, *interruptaria* Grt. I have examined the type male and female of the first named species and the type female of the last named and find the following additional differences which however do not hold when other specimens of the same genera and even of the same species are examined: the truncated cone of the front in *Glaucina* is slightly more developed than in *Cænocharis*, and the tongue seems stronger, in *Glaucina* there is no accessory cell and  $R_2$ ,  $R_{3+4}$  and  $R_5$  are on one stem, whereas in *Cænocharis* an accessory cell is present and all four branches of the radius are on one stalk. In venation, however, I am inclined to believe that the female type of *interruptaria* is an anomaly for in no other specimen referable to either of the two genera have I been able to discover an accessory cell.

*Synglochis* is nearly allied to the above two genera, differing chiefly in the absence of the upper pair of spurs on the hind tibia, the much longer truncated cone on the front and in the tongue which is rudimentary; from *Cænocharis* it differs further in the presence of the tibial claw.

*Morina* is widely different from any of the foregoing in wing shape, which is broader, and, in the primaries, more pointed at the apex, with a straighter, almost concave costa, and with the anal angle produced. The antennal pectinations in the male, also, are much shorter, being bipectinate but not plumose, and clavate apically. From *Synglochis* it may be distinguished further by the presence of a second pair of spurs on the posterior tibia, which, however, are only half as long as the apical pair, and from *Cænocharis* by the presence of the tibial spur. There is a distinct accessory cell and the subcosta of the secondaries instead of approximating the radius in the region of the discal cell for two-thirds the length of the cell, touches or almost touches this vein only on the second fourth.

*Stenocharis* is a long-winged genus with the costa of the primaries

straight or slightly concave and the anal angle developed. It is unique in the series by having both thoracic and abdominal tuftings, and long slender palpi, and, with *Holochroa*, in having twelve instead of eleven veins,  $R_3$  and  $R_4$  being separate. In the character of the front it stands between the foregoing genera and *Tornos*, being neither smooth nor markedly tubercled, but rather between. It is bulged outwardly and has a circular disk, but neither the rim nor the center appear to be raised, though there is a misleading clump of dark colored scales in the center of the disk of the single species that has so far been assigned to the genus which might easily be construed as an eminence. The antennal pectinations of the male are quite long and clavate and again resemble those of *Tornos*. The fore tibia is unarmed; there is no accessory cell but a tendency for one to form between  $R_4$  and  $R_5$ , and the subcosta of the secondaries approximates the radius on the second third of the discal cell.

*Tornos* and *Exelis*, though so different in the character of the female antennæ, are much alike in other respects. Both have absolutely smooth fronts, and are so distinguishable from all the preceding. Both have heavy, short, porrect palpi, strongly developed tongues and a similar venation. The accessory cell was present in every specimen of *Tornos* examined, but in *Exelis* this proved variable and in the two specimens in which this character could be clearly seen one had the cell and the other lacked it. Packard's drawing of the venation of *Tornos* (Monogr. Geom., pl. II, f. 4), however, I may add, does not show an accessory cell.

*Holochroa* may be distinguished from all the genera treated here, except *Synglochis*, by possessing only a single pair of spurs on the posterior tibia. From this one genus it differs in many particulars: in the small slender, palpi, long-haired beneath, which are closely applied to the head and therefore slightly upturned, in the smooth front and heavily bipectinate instead of plumose antennæ, and also in wing shape which in the primaries though long is very straight on the costa and somewhat produced at the anal angle. It agrees again with *Synglochis* in having a rudimentary tongue. There are twelve veins in the forewings, agreeing in this respect with *Stenocharis*. The radial veins of the primaries with the subcosta are curved toward the costa and in the specimens examined the subcosta formed a second accessory cell by its union with  $R_1$  in the region of the normal accessory cell.

The genera *Glaucina* and *Cænocharis* have been a source of much perplexity to me. True, from a comparative study of their respective type species slight differences in the strength of the tongue as well as in the development of the protuberance on the front were found in addition to the chief differentiating character, the tibial claw, but these minor differences

practically disappear when all the species of each genus are studied, and are therefore of no generic value. From an examination of many specimens of *Glaucina epiphysaria* I was at one time led to believe that even the tibial claw was variable, but this proved later to be an error. It appears to be constant and as a convenience in dividing an unwieldy group I have kept the genera distinct on this character despite the fact that the type of *Cænocharis interruptaria*, certainly having no claw, is in general appearance almost precisely like some specimens of *Glaucina mormonaria*, a species with a well developed claw.

### *Glaucina* Hulst.

1896. HULST, Trans. Am. Ent. Soc., XXIII, 352. Type, *escaria* Grote.

Nine species referable to this genus have already been described: *eupetheciaria*, *pygmeolaria*, *escaria*, *elongata*, *golgolata*, *puellaria*, *erroraria*, *mormonaria* and *epiphysaria*. The last named is a very distinct species allied to *golgolata*. *Mormonaria*, likewise, is an easily recognizable species which in general appearance finds its nearest ally in *Cænocharis (interruptaria)*. The remaining species are closely related, differing chiefly only in size. In color all the sizes vary from pale gray to dark brownish-

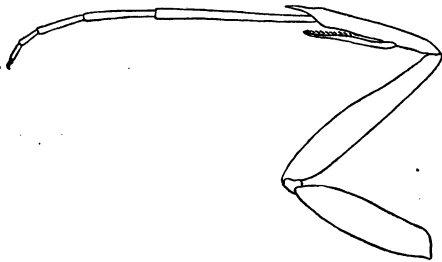


Fig. 1. Fore leg of *Glaucina*.

gray and as the style of maculation is practically identical in all it is impossible to draw distinct lines between the different ones. Yet that several species are concerned is evidenced by the structure of the genitalia.

### *Glaucina escaria* Grote.

1882. GROTE, Can. Ent., XIV, 186, *Tornos*.

1883. GROTE, Can. Ent., XV, 24, *Tornos*.

1887. HULST, Ent. Am., III, 11, *Lepiodes*.

1896. HULST, Trans. Am. Ent. Soc., XXIII, 352, *Glaucina*.

All manner of species have been passing current as *escaria* and not one as far as I have seen them are identical with Grote's types. It is possible that one or two of the specimens I have identified as *escaria* may not be that species, the Phoenix, Arizona, specimen for instance being whiter than the types and almost without markings, while the Redington example is gray

instead of brownish in tint and is apparently smoother in the texture of the wings; but these differences, I believe, are within the range of variation of the species.

**Habitat:** All the specimens I have seen are from Arizona,— Yuma Co., March 23; "South Arizona"; Redington; Rio Verde Mts. (Phoenix), Aug.

**Types:** One male and one female in the Brooklyn Institute Museum; one female in Rutgers College collection.

### ***Glaucina erroraria* Dyar.**

1907. DYAR, Jour. N. Y. Ent. Soc., XV, 106, *Glaucina*.

This species is closely allied to *escaria* and, indeed, may yet be found to be identical with it. The chief points of difference seem to lie in the whiter color of *erroraria* and the absence of the broad marginal band on the hind wings beneath. I have not seen the types, but Dr. Dyar has compared specimens which I had identified as his species with the types and pronounces them identical.

**Habitat:** Arizona, Hot Springs, June 21, and Tucson, July 19–20; California, Walter's Station, April.

**Types:** Four females in the National Museum one of which formed part of the material from which Hulst earlier described "*Cænocharis*" *elongata*.

### ***Glaucina eupetheciaria* Grote.**

1883. GROTE, Can. Ent., XV, 24, *Tornos*.

1887. HULST, Ent. Am. III, 11, *Lepiodes*.

1896. HULST, Trans. Am. Ent. Soc., XXIII, 353, *Cænocharis*.  
*pygmeolaria* Grote.

1883. GROTE, Can. Ent., XV, 24, *Tornos*.

1887. HULST, Ent. Am. III, 11, = *Lepiodes escaria*.

1896. HULST, Trans. Am. Ent. Soc., XXIII, 352, *Glaucina*; *bon. sp.*

All my efforts to make two species out of the types of these names have been futile and I am firmly of the belief that but one species is concerned. In size they are practically alike; all the markings on one can be traced on the other; and they are from the same locality. The only difference is in the color, *eupetheciaria* being a little paler than *pygmeolaria*, and this character is variable in all the members of the genus. In his latest list Hulst places these species in different genera, but an examination of the types shows

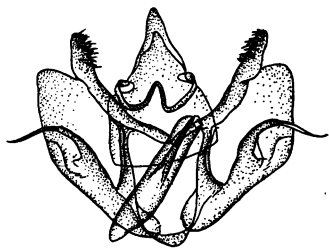


Fig. 2. Genitalia of *Glaucina eupetheciaria*.

these species in different genera, but an examination of the types shows

them to be congeneric. It will be best to regard the two species as one, and as *pygmeolaria* is described second on the same page with *eupetheciaria* it falls to this latter name.

In maculation *eupetheciaria* is practically identical with *puellaria* Dyar, a much larger species, and, as intermediates occur, it is almost impossible to draw a line between them. The genitalia likewise are much alike in both species as the figures show, but that only one species should be involved would seem incredible when we compare the sizes of the extremes, the largest *puellaria* having double the expanse of the smallest *eupetheciaria*.

Habitat: Arizona — Oracle; Phoenix, April 30, May 16, July 11; Baboquivaria Mts., July 15-30; South Arizona, Aug. 15-30; Santa Catalina Mts., July 24-31, Aug. 1-7; Redington; Prescott, May 29, July 23. New Mexico — Deming, July 8-23.

Types: The type of *eupetheciaria*, a unique male, and the male and female type of *pygmeolaria* are in the Brooklyn Institute Museum. Another "type" of *pygmeolaria* is in the Hulst collection at New Brunswick bearing a locality label "Phoenix, Ariz., June 5, '97." Obviously this is no type.

### *Glaucina puellaria* Dyar.

1907. DYAR, Jour. N. Y. Ent. Soc., XV, 105, *Glaucina*.

My determination of this species has been verified by Dr. Dyar after a comparison of our specimens with the type. The typical form, a large robust species with heavy markings, is apparently not common; but I have associated with it specimens of a smaller form which merges into *puellaria* on one hand and into *eupetheciaria* on the other; this form is evidently the one mentioned by Dyar in his original description of *puellaria* as a smoother, more silvery-gray species with the markings less defined and more broken. It may represent

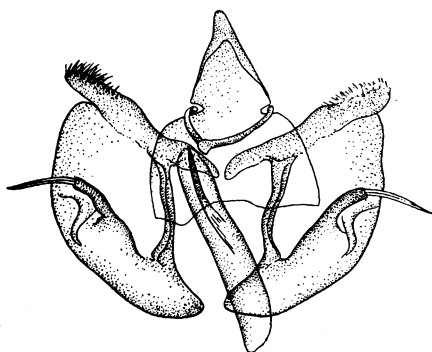


Fig. 3. Genitalia of *Glaucina puellaria*.

present a new species, but in spite of my long series I am unable to satisfactorily decide this point and for the present leave it undescribed.

Habitat: *Typical form*. Arizona — Baboquivaria Mts., Pima Co.; Phoenix; Catalina Springs; South Arizona. Colorado — Glenwood Springs. *Smaller form*. Arizona — Paradise, Rio Verde Mts. (Phoenix) Aug., Sept.; Yavapai Co.; Yuma Co.,

April 12-March 28; Baboquivaria Mts., July 8-30; Redington; South Arizona, May 1-15, Sept.; Colorado desert. New Mexico — Deming. California — Walter's Station.

Types: Five females in the U. S. National Museum; one female in collection. F. H. Snow (Kansas).

### *Glaucina elongata* Hulst.

1896. HULST, Trans. Am. Ent. Soc., XXIII, 353, *Cænocharis*.

1907. DYAR, Jour. N. Y. Ent. Soc., XV, 106, concerning type.

In describing this species Hulst does not say how many specimens were in hand, but from the fact that two localities are given, Texas and Arizona, we know that more than one specimen was before the author. There are at least five types labelled as such in existence, a male and female in Hulst's own collection, a female in the Brooklyn Institute Museum, and two specimens in the National Museum, one of which as above mentioned, a female from Arizona, formed part of the material from which Dyar described his *Glaucina erroraria*. The other type in the National Museum Dyar says is *Glaucina pygmeolaria*. Dyar rejected the Arizona type because it had a spur on the fore tibia and so went into the genus *Glaucina* whereas Hulst described the species in *Cænocharis*. As a matter of fact all the types whether from Texas or Arizona have the tibial spur. The Texas types, however, differ from those from Arizona in their clay-yellow rather than gray color which renders the insect very different in general aspect; it is, I presume, a distinct species allied to *puellaria*. Dyar has already limited Hulst's name to this form by using an Arizona specimen as the type of another species.

Habitat: San Antonio, Texas.

Types: The location of these is indicated above.

### *Glaucina pearsalli*, new species.

Expanse, 33-35 mm. Head, body and primaries dark ash-gray; secondaries white, except the inner area which is dark ash gray. Intradiscal line of primaries more than one-third out, blackish, rather broad and diffuse, crenulate; as a whole rather straight except at costa where it bends in toward costal margin. Extradiscal line blackish, more defined, crenulate, extends from less than one-fourth in from apex to middle of inner margin. Occasionally these lines are obsolete or, on the other hand, emphasized on the veins. Discal spot round, black, diffuse. Fringe gray. Secondaries with a blackish median line showing on inner area. Terminal line blackish. Discal spot moderate in size, conspicuous on the clear white ground. Fringe white. Beneath, whitish with a sparse scattering of fine gray scales which gather particularly on the costa and toward the apex of primaries and on inner area of secondaries. Discal spots present on all wings and usually conspicuous.

Types: Four males from Mr. R. F. Pearsall, one cotype of which is in the American Museum of Natural History.

Habitat: Parker, Arizona, March 7, 12, 13 and 14.

*Pearsalli* resembles *puellaria* in size and markings but the secondaries except for the inner area are glistening white, not smoky, and the primaries

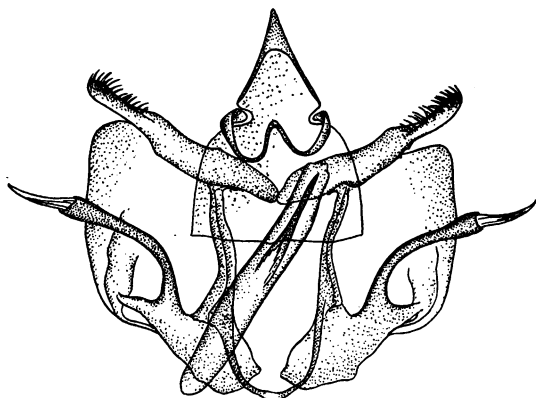


Fig. 4. Genitalia of *Glaucina pearsalli*.

are a soft ash-gray rather than brownish-gray. The genitalia show that we have here a valid species and not a mere variety to contend with.

#### ***Glaucina abdominalis* new species.**

Expanse, 23-24 mm. Head, thorax and all wings whitish, rather sparsely sprinkled over with fine blackish scales. Abdomen whitish, becoming brownish apically, and with a moderate sized spot bordered with brown on each of the first two segments. Intradiscal line indicated by an obscure, irregular shade. Extradiscal line brown, narrow, denticulate, extending in a rather straight line from one-fourth in on costa to one-third in on inner margin. Subterminal line absent. Terminal line brown, fine, continuous. Discal spot a small obscure, linear spot. Fringes white. Secondaries with a faint indication of an irregular line running through the center. Discal spot small, round, distinct. Terminal line and fringes as in primaries. Beneath, uniformly whitish, the discal spots and terminal lines faintly indicated.

Described from two male specimens collected by Mr. Geo. H. Field. Type in the American Museum of Natural History; cotype in Mr. Field's collection.

Habitat: San Diego, California, July 31 and August 1.

With its pale color, almost straight denticulate line, and spotted abdomen this species should be rather easily distinguished from all other described species of the genus.

***Glaucina bilineata*, new species.**

Expanse, 35 mm. Head, body and fore-wings an even brown-gray. Primaries crossed by two contrasting, narrow, black lines. The inner or intradiscal begins one-third out on costa and extends to discal cell, then follows the radial vein outwardly to almost the middle of the cell, crosses the cell at this point and runs inward again on the cubital vein to just below the origin of the line, extending thence sinuously to inner margin. The outer or extradiscal line begins less than one-third in on costa and extends sharply denticulate to one-third in on inner margin running subparallel to the outer margin. Subterminal line scarcely visible as a denticulate whitish shade running through the center of the outer area. Terminal line black, continuous. Discal spot moderate in size, oval, not defined. Fringes concolorous with ground color of wing. Secondaries smoky, paler on disk, of the same color as primaries on inner area. A clearly marked, black denticulate line, extends from the middle of the inner margin to a short distance from  $Cu_2$  ending abruptly at this point. Terminal line black, continuous. Discal spot as in primaries. Fringes smoky becoming whitish toward apical angle. Beneath, pale gray, smoky outwardly on all wings. Discal spots large, conspicuous, especially on secondaries.

Named from one female in Dr. Wm. Barnes's collection.

Habitat: Redington, Arizona.

A very marked species readily known by its two contrasting lines, the inner of which is singular in that it runs outwardly along the veins of the discal cell through the center of which it crosses.

***Glaucina epiphysaria* Dyar.**

1908. DYAR, Proc. Ent. Soc. Wash., X, 55, *Glaucina*.

This seems to be a common species in southern California, no less than one hundred and eighty specimens being before me from this region. The dates on the various specimens would seem to indicate that there are two flights annually, one from mid-March or slightly earlier to the end of April, and another from the latter part of June through July, August and September to late October. Probably, however, the species flies continuously from March to October. Dyar suggests (*in litt.*) that this species may equal Strecker's *golgolata* described from Nevada but I am quite convinced that the two forms are distinct.

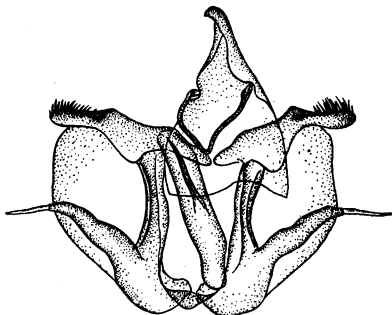


Fig. 5. Genitalia of *Glaucina epiphysaria*.

Habitat: California — San Diego, March 11–Apr. 26, June 21–October 7–29; Pasadena, Apr. 29; West Riverside, October 1–28.

Types: One male and two females in the U. S. National Museum.

***Glaucina golgolata* Strecker.**

1899. STRECKER, Lep. Rhop. Het., suppl. 2, 11, *Eupethecia*.

1902. HULST, Bull. 52, U. S. Nat. Mus., 272, *Tephroclystia*.

1905. DYAR, Proc. Ent. Soc. Wash., VII, 93, *Glaucina?*

I cannot satisfactorily identify anything before me with this species. Dr. Dyar says (see above) that it may be the same as his *epiphysaria* and certainly it approaches this species more closely than any other; yet in all the series of *epiphysaria* before me not one matches it in all respects. That the two species are distinct I have little doubt.

Habitat: Nevada.

Type: One female in the Field Columbian Museum.

***Glaucina magnifica*, new species.**

Expanse, 28–33. Head, body and fore-wings dark gray, tending to brown. Collar of thorax black. Primaries crossed by two blackish lines sometimes continuous, but usually broken up into spots or dashes; rarely one or both are absent or almost so. Intradiscal line extends obliquely from one-third out on costa to center of discal cell, then, forming an acute angle, extends irregularly inward to near the base of the wing on inner margin. Extradiscal line extends inwardly curved from one-third in on costa to  $M_3$ , thence runs irregularly inward to inner margin ending close to the termination of the intradiscal line. A diffuse median shade is sometimes present on the inner margin between the two primary cross-lines and this rarely extends inwardly toward the center of the wing, where it fades out. Subterminal line whitish, distinct, strongly scalloped between the veins. The spaces formed by the subterminal line inwardly are filled in with blackish lunules, more or less defined. Terminal line blackish, fine, complete. Discal spot absent or represented by a faint oval shade. Secondaries smoky, gray on inner area where three lines extending a short distance into the wing are more or less sharply marked. Beneath, even smoky-gray on primaries, a discal spot usually showing, whitish and finely irrorate on secondaries, a small round discal spot showing quite conspicuously.

Described from many specimens of both sexes from the collections in the American Museum of Natural History and in those of Mr. R. F. Pearsall and Dr. Wm. Barnes.

Habitat: San Diego, California, August 15 to October 9; and West Riverside, California.

Several specimens too badly rubbed to be made types are dated February 28 and October 1 to Nov. 2.

Though scarcely to be associated with *mormonaria* at first sight the genitalia indicate that these species are closely allied, this structure being practi-

cally alike in both. A closer examination shows also that the pattern of the wings is roughly similar though much more definite in *magnifica*. The larger size and far darker coloring of this new species will further distinguish it from the whitish-gray *mormonaria*.

### ***Glaucina hulstinoides*, new species.**

Expanse, 24.5-27 mm. Head, body and all appendages with mixed white and black scales, sometimes one, sometimes the other color predominating. The posterior part of the head, the collar, and the second abdominal segment are usually almost entirely black. The maculation of the abdomen is various, rarely (in one specimen) assuming double dorsal spots on the posterior segments. The primaries appear oddly longitudinally strigate, and are crossed diagonally (from apex to inner margin) with more or less indefinite cross lines. The longitudinal strigation is brought about by the veins being narrowly lined with clear white. The intradiscal line, narrow and blackish, is only obvious from near the base of the inner margin to the middle of the submedian cell, and even here is often broken or obscured. The extradiscal line is geminate, blackish, and like the intradiscal line begins on the inner margin near the base and extends only partially across the wing; usually continuously to vein cubitus 1 and thence continued in a series of two or three spots above this point. Externally this line is bordered by a white line which extends beyond the black intradiscal line to the costa, curving sharply inward on vein radius, and then extending in a straight line to the costal margin. A second narrower white line, constituting the subterminal line, runs parallel to this from the inner margin to  $M_1$ , never exceeding this vein. Terminal line fine, black, continuous. Fringe with a broad blackish band running through the center. The secondaries are quite uniformly grayish or whitish, with the terminal line and fringe as in the primaries and with indications of three blackish straight lines extending from the inner margin partly into the wing. Beneath, the primaries are whitish or grayish with the costa mottled with clear black specks; the secondaries are white with profuse scatterings of black scales, particularly basally; the terminal line and fringe on both wings are as on the upper surface.

Types: Seven males and three females received from Mr. R. F. Pearsall, several cotypes of which are in the American Museum of Natural History.

Habitat: La Puerta, California, October 10 to 22.

This species roughly resembles *Hulstina terlineata* Dyar in superficial aspect, but is a true *Glaucina* having both a tibial spine and tuberculated front.

### ***Glaucina mormonaria* Dyar.**

1907. DYAR, Jour. N. Y. Ent. Soc., XV, 106, *Glaucina*.

This species seems to fly not uncommonly in Utah in association with *Cænocharis interruptaria* Grote from mid-May to mid-September, the specimens found toward the end of the season being smaller than those which

emerge earlier. In general the maculation of the wings is more or less broken up and suffused but occasionally becomes definite and then we get a pattern so similar to that of *interruptaria* that for a time I was almost misled into believing that both species were one. The chief superficial difference between the two seems to be in the extradiscal line of the primaries which in *mormonaria* tends to break up into spots while that of *interruptaria* breaks up into dashes on the veins.

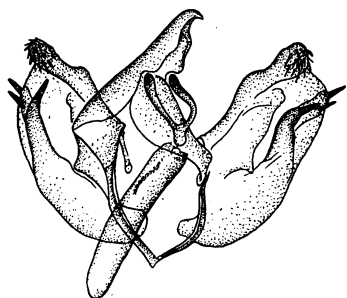


Fig. 6. Genitalia of *Glaucina mormonaria*.

Habitat: Utah — Stockton, May 16, 26, June 21, 23, July 30, August 3, 4, Sept. 6–12; Eureka, May 6 to June 9, August 1. Arizona —

March 16–23; Redington. Colorado — Durango, July 8–15.

Types: Three males and two females in the U. S. National Museum; one cotype in the American Museum of Natural History.

### ***Cœnocharis* Hulst.**

1896. HULST, Trans. Am. Ent. Soc., XXIII, 353. Type, *interruptaria* Grote.

Four species belonging to this genus have been described. They are in the order of their description: *interruptaria*, *ochrofuscaria*, *ignavaria* and *denticularia*. *Eupetheciaria* and *elongata* referred to this genus in Hulst's 'Classification' do not, as I have shown in the foregoing, belong here.

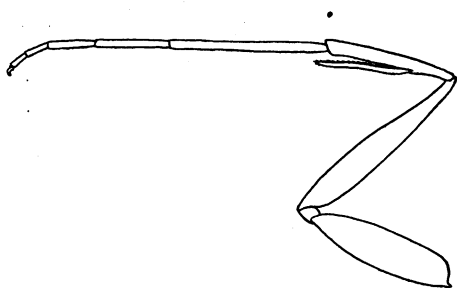


Fig. 7. Fore leg of *Cœnocharis*.

### ***Cœnocharis interruptaria* Grote.**

1882. GROTE, Can. Ent., XIV, 185, *Tornos*.

1883. GROTE, Can. Ent., XV, 24, *Tornos*.

1887. HULST, Ent. Am., III, 11, *Lepiodes*.

1888. HULST, Ent. Am. IV, 49, = *Lepiodes behrensata*.

1896. HULST, Trans. Am. Ent. Soc., XXIII, 353, *Cœnocharis*; *bon. sp.*

This species was described from a female taken in Arizona. In general appearance it is extremely close to *Glaucina mormonaria* Dyar and since this name has been proposed *interruptaria* has been masquerading under it.

The species seems to be quite common in Utah where in Stockton we have it as occurring continuously from May 16 to Sept. 12, and in Eureka from May

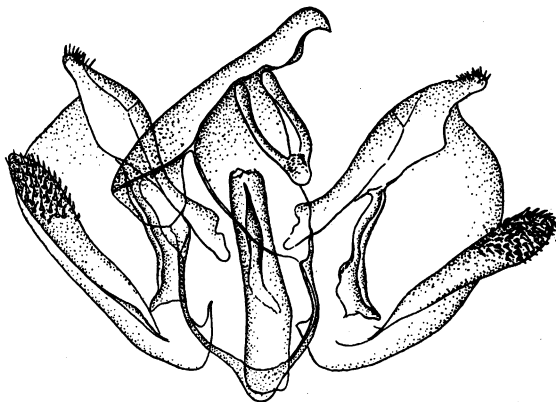


Fig. 8. Genitalia of *Cænocharis interruptaria*.

9 to Aug. 1, skipping however the month of July. It occurs also in Arizona — Prescott, Aug. 30, and Redington — and in Blanco Co., Texas. Dr. Dyar (Proc. Ent. Soc. Wash., V, 226, 1903) records it also from Williams, Ariz.; but it is very doubtful whether this record really refers to *interruptaria*.

Habitat: As above.

Type: One female in the Brooklyn Institute Museum.

### ***Cænocharis ochrofuscaria* Grote.**

1882. GROTE, Can. Ent., XIV, 186, *Tornos*.

1883. GROTE, Can. Ent., XV, 25, *Tornos*.

1887. HULST, Ent. Am., III, 11, var. of *Lepiodes interruptaria*.

1896. HULST, Trans. Am. Ent. Soc., XXIII, 353, *Cænocharia*; *bon. sp.*

This species was described from a single specimen and the fact that the maculation is scant and indistinct may account for its having been unrecognized since it was named. I am pleased to be able to say therefore that several good specimens unquestionably of this species have been discovered.

Habitat: Arizona — Prescott, Sept. 16–18; Phoenix, April 18, 19; Parker, March 9, 12, 15; Christmas, Gila Co.; Redington.

Type: One female in the Brooklyn Institute Museum.

There are evidently several closely allied species comprising the *ochrofuscaria* group. The typical form from Arizona expands 23–27 mm.,

averaging about 25 mm., and has the markings more or less diffuse; *macdunnoughi* ranges between 26.5 and 29 mm. and has the cross lines emphasized on the veins with the intervening space more or less filled in with dark scales; *indistincta* is the smallest ranging between 20 and 24 mm. with the markings diffused exactly as in *ochrofuscaria*; while *obscura* is much the largest, expanding 30–34 mm. and has the markings even more obscured than either *indistincta* or *ochrofuscaria*. *Macdunnoughi* occurs with the type form in Arizona, and *indistincta* seems to be confined to southern California, from whence many specimens have been received.

### ***Cœnocharis indistincta*, new species.**

Expanse, 20–24 mm. Head, thorax, abdomen, primaries and inner margin of secondaries whitish, in the male densely, in the female sparsely scattered over with blackish scales. This scattering of scales is very uniform. Primaries with two blackish cross lines, more or less indeterminate, sometimes entirely absent. When present the inner or intradiscal line irregular, begins on inner third or fourth of costa, extends outward in the region of the discal cell, then runs irregularly to inner fourth of posterior margin. The outer or extradiscal line also irregular, begins on outer fourth of costa, extends inwardly curved to center of wing, then forms a V-shaped mark on the crotch of  $Cu_1$  and  $Cu_2$  and runs inward to inner third of posterior margin. Externally this line is bordered by a whitish line of ground color. Subterminal line white, formed

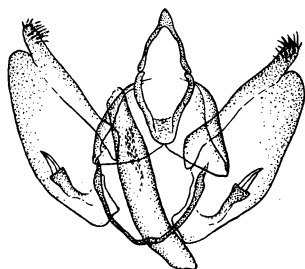


Fig. 9. Genitalia of *Cœnocharis indistincta*.

by a series of scallops between the veins. Terminal line black, continuous. Discal spot absent. Secondaries except inner margin an even smoky gray (male) or whitish (female). Beneath, primaries pale smoky; secondaries whitish, sparsely irrorate with fine brown atoms. Discal points evident in some specimens.

Types: Thirteen males and eight females collected by Mr. Geo. H. Field. Types and cotypes in the American Museum of Natural History; and cotypes with Mr. Field.

Habitat: San Diego, California, July 11–August 1.

This species is very close to *ochrofuscaria* but is uniformly smaller and lacks that distinct ochreous color which led Grote to apply the name *ochrofuscaria* to his species. It is possible that the two may eventually be found to be the same but since a number of specimens, all similar in size and color, have been identified with Grote's species, I prefer to name the present species rather than unite it doubtfully to another.

**Cænocharis macdunnoughi**, new species.

Expanse, 26.5–29 mm. Head, body and ground color of wings whitish or brownish, the latter color produced by a profuse scattering of fine brown scales. Primaries with intradiscal line represented by black dashes on the veins about one-third out on wing. Extradiscal line similarly represented, but occasionally the dashes are feebly connected by a brown diffuse band; together they form a scalloped line, the black dashes constituting the apices of the individual scallops. In its course it extends from one-fourth in on costa irregularly to middle of inner margin, being drawn in between veins  $Cu_2$  and the anal vein and connected at this point with the intradiscal line by an intervenular black dash. A diffuse brownish dash also occupies the discal cell. Outer area pale at extradiscal line, darker outwardly, and with a brown shade running through the center. Terminal line black, continuous. Fringe gray. Secondaries with a moderately broad median line, quite regularly curved, rather feebly defined anteriorly and pronounced at inner margin. Terminal line and fringe as in primaries. Discal spot absent. Beneath pale gray or pale brownish, the secondaries somewhat irrorate with pale brown.

Types: Two females from Dr. Barnes, the cotype of which is in the American Museum of Natural History.

Habitat: Christmas, Gila Co., Ariz., and Redington, Ariz.

This species may be easily recognized by the two cross lines being heavily marked on the veins and between which the space is in part darker than the rest of the wing. I take pleasure in naming this species after Dr. Jas. McDunnough, the indefatigable curator of the Barnes collection of Lepidoptera.

**Cænocharis obscura**, new species.

Expanse, 30–34 mm. Head, body and primaries with mixed brown and whitish scales rather evenly distributed. Two blackish lines usually only vaguely indicated cross the primaries. The first, sometimes practically absent, extends out from costa to center of discal cell then bends acutely inward and runs slightly irregularly to inner margin ending one-fifth or less out from base on this margin. The second begins on the costa less than one-fourth in from apex and extends subparallel to outer margin, denticulate to  $Cu_2$ , then irregular to near the middle of inner margin. This line is usually emphasized on the veins, and may be entirely lost except on the veins and in the inner area. Subterminal line scarcely traceable in the outer area as a waved whitish line. Terminal line deep brown, continuous. Discal spot not evident. Secondaries rather even pale yellowish-brown except at the inner margin where they are grayish like the fore wings. A single median brown line is indicated at the middle of the inner area. Discal spot absent. Beneath, the primaries are very pale yellowish-brown; the secondaries white with fine brown atoms evenly scattered over the surface. Discal spots absent.

Types: Five males from Dr. Barnes, two cotypes of which are in the American Museum of Natural History.

Habitat: South Arizona, April 1–15 and September.

In style of maculation this species is much like *indistincta* and *ochrofuscaria* but differs greatly in size and is also more uniform in coloring. From *indistincta* it may be further distinguished by the lack of the pure white color on the wings which tends to emphasize the more definite markings in that species.

***Cœnocharis ignavaria* Pearsall.**

1906. PEARSALL, Sci. Bull. Brook. Inst. Mus., I, 216, *Cœnocharis*.

A large species with the same general type of maculation as *Glaucina eupetheciaria* and *G. puellaria* but larger than either and of a dark grayish-brown or blackish color throughout. The original description reads as though only one specimen served as type but in the list of species taken in Utah, Arizona and Texas preceding the description two males are recorded. June is given as the date of their capture though the cotype in Mr. Pearsall's collection is labelled July. In addition to the type there are two other specimens of the same species in the Brooklyn Museum both according to Mr. Doll collected with the types at Palmerlee, Cochise Co., Ariz. Dr. Barnes has the insect also from the White Mts. and the Huachuca Mts., both in Arizona. Still another specimen which appears to be this species but is somewhat paler in color is from Texas (Brooklyn Museum).

Habitat and types: As above.

***Cœnocharis denticularia* Dyar.**

1907. DYAR, Jour. N. Y. Ent. Soc., XV, 107, *Cœnocharis*.

This species still remains known to us by the unique specimen from which it was described. Dyar compares it to *Glaucina golgolata* Streck. but from the description I would say it was nearer my *Glaucina magnifica* in appearance. The species was described from the Chirichua Mts. in Arizona and the type, a male, is in the National Museum.

***Cœnocharis eureka*, new species.**

Expanse, 27-28 mm. Entire moth ashy-gray, caused by the even distribution of fine black scales over a whitish ground. The secondaries, except the inner area, appear smoother and very slightly browner than the primaries. Intradiscal line of primaries represented by an obscure dash at one or two places about one-fourth out from the base of the wing. Extradiscal line brown, begins on costa one-fourth in from the apex and extends irregularly denticulate to the middle of the inner margin, being emphasized on the veins, and lost or faint between them above Cu<sub>1</sub>, but contin-

uous below  $Cu_1$ . Subterminal line barely traceable as a fine denticulate white line. Terminal line brown, continuous, slightly extended inwardly on the veins. Discal spot absent. Fringes concolorous with ground color. Secondaries with a short distinct line in center of inner area, which may sometimes be traced across the wing as a more or less interrupted denticulate brown line. Discal spot absent. Terminal line brown, even, continuous. Beneath, uniform, ashy-gray.

Types: Two females received from Mr. R. F. Pearsall, one of which, the cotype, is deposited in the American Museum of Natural History.

Habitat: Eureka, Utah, May 9 and 31.

A very distinct and characteristic species distinguished from all others of the genus by the ashen-gray color and the single line obliquely crossing the fore-wings.

### ***Synglochis* Hulst.**

1896. HULST, Trans. Am. Ent. Soc., XXIII, 351. Type, *perumbraria* Hulst.

### ***Synglochis perumbraria* Hulst.**

1896. HULST, Trans. Am. Ent. Soc., XXIII, 352, *Synglochis*.

A species with a characteristic robust, rough-scaled appearance by which it can usually be identified. The two broad, diffuse lines crossing the primaries somewhat irregularly will also serve as aids in determination, though one or both of these may be wanting. The peculiar truncated cone on the front is only equalled in size by *Morina coniferaria* Gross., while the single spur on the hind tibia distinguishes it from all other species of the group except *Holochroa dissociarius* Hulst.

Types: The only types that I have been able to locate are one male and one female in the Rutgers College collection at New Brunswick. The female is from San Bernardino, California, and coming from the region from whence the species was described — South California — is undoubtedly a type; but the male (and this sex also was before the author when describing the species as is shown by the generic diagnosis) is from Colorado desert and therefore probably not a type. Though the species was described from specimens received from both Edwards and Riley no types are in either the American Museum or the National Museum collections; nor have I been able to find any in the Brooklyn Institute collection where Hulst placed a part of his types.

### ***Morina*, new genus.**

Palpi short, not exceeding the front, vestiture loose at base; head when denuded, corneous, vertex high, two small, lobe-like processes beneath each eye, front strongly

tubercled, circular, consisting of a disk with an elevated rim and with a high corneous truncated cone in the center; tongue developed; antennæ of male bipectinate, tip simple, the pectinations moderately long and clavate; of female, feebly serrate.

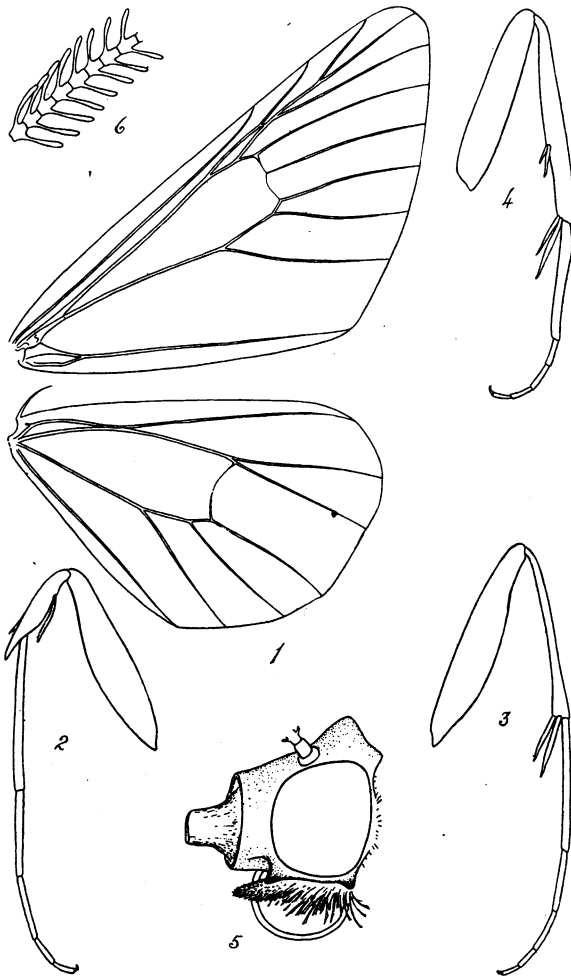


Fig. 10. *Morina*: 1, venation; 2, 3, 4, fore-, mid-, and hind-leg; 5, head in profile; 6, section of male antenna.

Thorax and abdomen untufted. Anterior tibia short, the apex extended into a long heavy spine; posterior tibia not swollen, without hair-pencil, with double pair of spurs. Primaries rather broad, costa straight, apex rounded; secondaries normally broad. Venation: primaries 11 veins,  $R_2$ ,  $R_3 + 4$  and  $R_5$  on one stalk,  $M_1$  from discal

cell; one accessory cell present; secondaries, Sc separate, approximating R for a short distance near center of discal cell,  $M_2$  absent.

Type: *Morina coniferaria* Gross.

A genus distinct from the others of the *Cænocharis-Glaucina* group by its broader wings. This difference is correlated by differences in head and antennal structure.

### ***Morina coniferaria*, new species.**

Expanse, 20–24 mm. Head, thorax and abdomen pale brown tending to whitish. Abdomen with double dorsal brown spots on the posterior part of each segment. Primaries reddish-brown over a whitish background. Intradiscal line brown, fine, originates on costa one-third out and extends irregularly outward to near base of wing at inner margin, being acutely angled inwardly on anal vein. This line is preceded more or less distinctly by a ferruginous shade. Both lines are occasionally lost in part by the deepening of the ground color. Extradiscal line brown, fine, originates on costa one-fifth in from apex and extends very irregularly to middle of inner margin. To vein  $M_1$  this line is somewhat broken and runs slightly outwardly toward outer margin; from this point on it is complete. Externally it is bordered by a deep ferruginous shade. Subterminal line whitish, irregular, usually only vaguely showing. Terminal line brown, scalloped. Discal spot small round and usually distinct. A blackish subapical dash in outer area. Secondaries pale, whitish in anterior part, pale brown posteriorly. A distinct median brown line preceded by a brown shade and succeeded by a ferruginous shade is present on the inner margin, and extends only partly into the wing. Subterminal line showing only on posterior half of wing. Terminal line as in primaries. Discal spot small, black, sometimes absent. Beneath, whitish or brownish and more or less speckled with brown. Discal spots usually conspicuous, though sometimes absent.

Types: Two males and two females from Dr. Barnes, a pair of cotypes of which are deposited in the American Museum of Natural History.

Habitat: Baboquivaria Mountains, Pima Co., Ariz., and "South Arizona." May 1–15, July 16–23 and Aug. 1–15.

A very curious species with somewhat the aspect of the members of Boarminæ group. Its structural characters however place it in with *Glaucina* and *Cænocharis*.

### ***Stenocharis*, new genus.**

Palpi moderately long, terminal joint long, slender, drooping; tongue strongly developed; front produced, consisting of a circular disk slightly elevated in the center; antennæ of male bipectinate almost to tip, the pectinations rather short and distinctly clavate. Thorax tufted posteriorly. Abdomen long, with dorsal tufts on first four segments, and lateral tufts on the apical segments. Anterior tibia unarmed; posterior tibia slender, without hair-pencil, with two pairs of spurs. Primaries long and narrow, costa rather straight, apex pointed, angle of outer margin

at center and anal angle distinct as compared with *Cænocharis* and *Glaucina*; secondaries moderately broad, slightly excavated between veins  $M_1$  and  $M_2$ . Venation:

primaries, 12 veins,  $R_3$  and  $R_4$  stalked with  $R_2$ ;  $R_5$  and  $M_1$  from discal cell, no accessory cell, though there is a tendency for one to form near the base of  $R_4$  and  $R_5$ ; secondaries, Sc separate, approximating cell to beyond middle,  $M_2$  absent.

Type: *Stenocharis permagnaria* Gross.

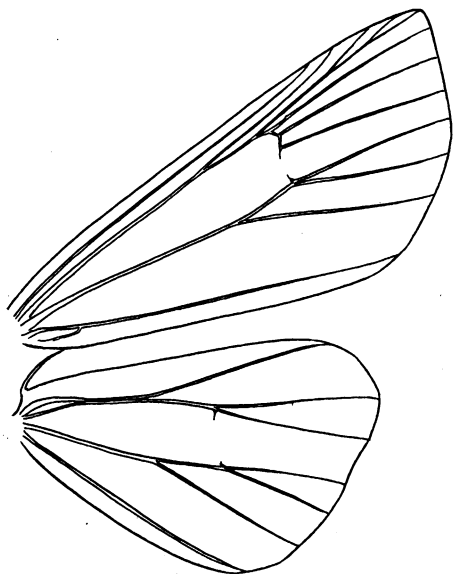


Fig. 11. Venation of *Stenocharis*.

Though belonging to the *Glaucina-Cænocharis* group this genus differs widely in the shape of the wings, which have a far more squarish rather than elliptical shape, in the short instead of plumose antennal pectinations, in the thoracic and abdominal tufting and in the venation; in addition the style of pattern on the wings is quite different.

### ***Stenocharis permagnaria*, new species.**

Expanse, 37 mm. Head and body grayish-brown. Thorax with a jet black spot in center near posterior margin, and abdomen with a black tuft on each of the first four segments. Antennæ yellowish-brown, strongly pectinated but not plumose as are those of the other members of the group. Ground color of wings light grayish-brown, the inner area and parts of the costal area of primaries external to the extradiscal line whitish. Intradiscal line blackish, narrow, crosses inner fourth of wing; is rounded outwardly from costa to middle of submedian cell, and, forming a rather sharp angle extends outward again to inner margin. Extradiscal line in width and color similar to intradiscal line; originates on costa beyond the middle and extends in a slightly inward and then broadly outward curve to  $Cu_2$ , then turning slightly inward extends wavyly to inner margin. A distinct black apical and three subapical dashes, the central of these latter the largest, are present quite close to the costa. A faint brown and ochreous cloud is also present in the outer area near the anal angle. Terminal line fine, deep brown, continuous. Median and outer areas, especially the median, finely strigate with dark brown. Secondaries pale smoky inwardly, becoming darkly so outwardly. Discal spot faint, lunular. Beneath, pale yellowish-gray becoming on the primaries smoky apically. Cross lines absent, but the apical marks of the upper surface reproduced. Secondaries with terminal line fine, but very contrasting. Discal spot moderate in size, round, brown.

Types: One male from Dr. Barnes and in his collection.

Habitat: Chiricahua Mts., Cochise Co., Arizona, June 16-23.

The unique type is a handsome species with the style of ornamentation approaching that of *Tornos* nearer than any other group or species considered in this paper, yet is widely different even from this. Its large size, long wings, pale grayish-brown color, distinct apical dashes and abdominal tufts should render this a very easily distinguishable species.

### ***Tornos* Morrison.**

1875. MORRISON, Proc. Bost. Soc. Nat. Hist., XVII, 217. Type, *scolopacina* Gn.

1876. PACKARD, Monogr. Geom., 214, pl. II, f. 4.

1896. HULST, Trans. Am. Ent. Soc., XXIII, 351.

Guenée drew up his description of the genus *Lepiodes* (Spec. Gén., X, 359, 1857) from two species of moths, one African and the other American,

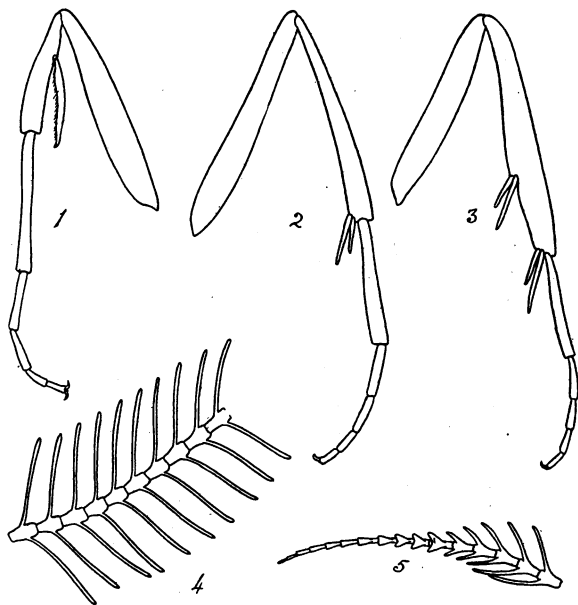


Fig. 12. *Tornos*: 1, 2, 3, fore-, mid-, and hind-leg; 4, section of male antenna; 5, tip of male antenna.

which apparently were quite similar in structure except that in the male the African species had fasciculed antennæ while the American one had

them strongly pectinated. Hulst regarded the differences between the species as of generic value and, as *infectaria*, the Eastern species, is first described under the genus and also the one figured, he limited the name *Lepiodes* to *infectaria* and restored Morrison's name *Tornos* for our species. Marked differences in antennal structure are generally used by Americans as criteria for generic separation, and as a disregard of such differences would lead to the needless fusion of many of our genera, I am following Hulst in regarding *Tornos* as distinct from *Lepiodes*.

*Table for the determination of the species of Tornos.*

Extradiscal line of primaries absent or represented by a series of dots on the veins	<i>scolopacinaria</i> .
Extradiscal line of primaries usually well marked, continuous.	
Ground color reddish-brown, cross lines heavy, discal spot large and composed of long erect scales	<i>cinctarius</i> .
Ground color yellow or very pale brown, rarely scattered over with deep brown, cross lines narrow, discal spot 1 mm. or less in diameter, and composed of rather short erect scales.	
Expanse 23-24.5 mm., ground color of ♀ yellow, of ♂ checkered yellow and brown	<i>erectarius</i> .
Expanse 26.5 mm.-32 mm., ground color of both sexes a modest dull yellow or pale brown	<i>fieldi</i> .

***Tornos scolopacinaria* Guenée.**

1857. GUENÉE, Spec. Gén., X, 360, *Lepiodes*.  
 1862. WALKER, Cat. Lep. Het. Brit. Mus., XXIV, 1250, *Lepiodes*.  
 1867. PACKARD, Mongr. Geom., 565, *Lepiodes*.  
 1896. HULST, Trans. Am. Ent. Soc., XXIII, 351, *Tornos*.  
 1912. BARNES and McDUNNOUGH, Psyche, XIX, 16, *early stages*.  
*robiginosus* Morrison.  
 1875. MORRISON, Proc. Bost. Soc. Nat. Hist., XVII, 218, *Tornos*.  
 1876. PACKARD, Monogr. Geom., 214, pl. IX, f. 39, *Tornos*; 564, pl. XIII, fs. 3,  
 3a, *larva*.  
 1887. HULST, Ent. Am., III, 11, = *scolopacinaria*.  
 1895. HULST, Ent. News, VI, 103, = *scolopacinaria*.  
*abjectarius* Hulst.  
 1887. HULST, Ent. Am., II, 192, var. of *Tornos robiginosus*.  
 1896. HULST, Trans. Am. Ent. Soc., XXIII, 351, *Tornos*; *bon. sp.*  
 1907. GROSSBECK, Trans. Am. Ent. Soc., XXXIII, 342, = ♂ *scolopacinaria*.

In describing this species Guenée commented on the dissimilarity in the color of the sexes as did also Morrison in diagnosing *robiginosus*. Packard further spoke of the extreme variability of the form, and said three species could easily be made out of the twelve specimens before him. The third

"species," however, would have been based on size and not color. Yet, in spite of all this, Hulst, having evidently only females before him to represent *scolopacinaria*, redescribed the male as a variety of *robiginosus*. Later, in his 'Classification' this variety was accorded specific rank.

The metropolis of the species seems to be in Texas from whence it is constantly being received, but its range extends eastward to Florida, west-

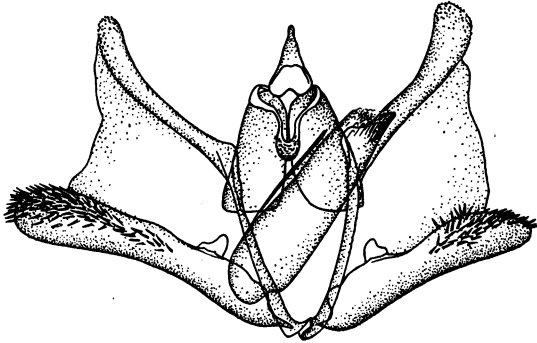


Fig. 13. Genitalia of *Tornos scolopacinaria*.

ward to Arizona and northward to Wisconsin (Milwaukee), and Pennsylvania (Harrisburg). It is rare in the northern part of its range and this probably accounts for its larva never having been adequately described.<sup>1</sup> Abbott in his manuscript drawings figures the peculiar tubercled larva on its food plant ("*Coreopsis* [*Primula*] *auriculata* or probably *grandiflora*") together with the pupa and both sexes of the adult, and Packard in his monograph drew up his description of the larva from this figure. As to the habits of the adult we have merely the statement by both Riley<sup>2</sup> and Grote<sup>3</sup> (the latter evidently referring to this species) that the abdomen is raised above the thorax in repose.

In Texas the species flies from February 18 (the earliest date I have for its occurrence) continuously to October, unless for some reason it does not occur in September for which month I have no records. From Arkansas I have a specimen labelled as occurring in June; from Missouri it is recorded as occurring on April 19, and from Harrisburg, Pa., on Aug. 21.

Types: Guenée described his species from a male and female specimen in his own collection; Morrison's types, two of each sex, should be in either the Boston Society of Natural History or in the Museum of Comparative

<sup>1</sup> Barnes and McDunnough (see reference above) have described the larval stages since this paper was written. Food plant: Aster.

<sup>2</sup> Packard, Monogr., 215.

<sup>3</sup> Can. Ent., XV, 24, 1883.

Zoölogy at Cambridge though my notes on the collections in these Institutions make no mention of any being there; Hulst's types are distributed one each in his collection at Rutgers College, in the Brooklyn Institute and in the National Museum: all are males.

***Tornos cinctarius* Hulst.**

1887. HULST, Ent. Am., II, 192, var. of *Tornos robiginosus*.

1904. DYAR, Proc. Ent. Soc. Wash., VI, 225, *Tornos*; bon. sp.

1908. PEARSALL, Can. Ent., XL, 133, *Tornos*; bon. sp.

The status of this species has now been well worked out. Like *abjectarius* it, too, was originally described as a variety of *robiginosus*, but unlike it was retained as a variety by Hulst in his 'Classification.' Five specimens only are known, four from Florida and one from Georgia. Nothing is known of its habits or of the early stages.

Type: One female in Rutgers College collection. Mr. Pearsall has labelled a male specimen in Mrs. Slosson's collection "♂ type." The specimen was used for the purpose of drawing up a description of the male many years after the original description was published. It is therefore merely a plesiotype.

***Tornos erectarius* Grossbeck.**

1909. GROSSBECK, Can. Ent., XLI, 155, *Tornos*.

Originally described from five specimens taken in Pinal and Pima Counties, Arizona. The species has not since been taken to my knowledge. The dates for its time of flight range from July 15 to September.

Types: Male and female in the American Museum of Natural History; cotypes in Dr. Wm. Barnes's collection.

***Tornos fieldi*, new species.**

Expanse, 26.5-32 mm. Palpi with mixed yellow and brown scales, front to the antennæ usually entirely dark brown, vertex yellowish. Thorax and abdomen dull yellow, the former marked on the collar and across the posterior part of the patagia with brown, the latter more or less distinctly marked with white and brown at the posterior edge of the segments. Primaries dull yellow or pale dirty-brown sparsely speckled with dark brown atoms. Intradiscal line dark brown, narrow, irregular in its course across the inner fourth of the wing, never entirely complete and sometimes reduced to a few spots. Extradiscal line concolorous with intradiscal, fine, usually contrasting, continuous, and slightly emphasized at the veins. From the costa one-third in from apex, it extends in a broad outward curve to about vein  $M_3$ , then turns inward and extends obliquely to the inner margin ending close to the intradiscal line.

Subterminal line fine, whitish, rather evenly denticulate, preceded and succeeded near the costa by a brown shade, and sometimes lost in the ground color near the inner margin. Terminal line dark brown, usually interrupted at the veins. Fringe faintly checkered. Discal spot round, deep brown, conspicuous. Secondaries with ground color paler than primaries except on inner and outer areas. Extradiscal line when present running parallel to outer margin, usually obsolete toward costa. Terminal line brown, continuous. Discal spot oval, much smaller than in primaries. Beneath, very pale dull yellow, sometimes shaded with dusky brown outwardly. Terminal line and discal spots as on upper surface but less pronounced.

Types: Two males and four females received from Mr. Geo. H. Field of San Diego, Cal., after whom the species is named, and three males received from Dr. Barnes. Type male and female in the American Museum of Natural History; co-type with Mr. Field and Dr. Barnes.

Habitat: San Diego, California, June 4, 5, 7, 11, 12, 21, July 3 and Sept. 9.

As indicated in the table this species differs from *erectarius* by its larger size, and the uniformity of tint in the ground color of the sexes. There is a tendency on the part of the female to assume a color slightly yellower than in the male, but this is scarcely apparent as compared with *erectarius*.

*Tornos incopriarius* described by Hulst in 'Entomologica Americana,' vol. II, p. 210 (1887) and referred by him to *Glaucina* (Trans. Am. Ent. Soc., XXXIII, 352, 1896) has been shown by Pearsall (Can. Ent., XL, 134, 1908) to be identical with the species described as *Æthyctera lineata*.

### **Exelis** *Guenée*.

1857. GUENÉE, Spec. Gén., IX, 323. Type, *pyrolaria* Gn.

1860. WALKER, Cat. Lep. Het. Brit. Mus., XXI, 477.

1896. HULST, Trans. Am. Ent. Soc., XXIII, 351.

*Patridava* Walker.

1862. WALKER, Cat. Lep. Het. Brit. Mus., XXVI, 1688, type, *tensaria*.

1895. HULST, Ent. News, VI, 103, = *Exelis*.

### **Exelis** *pyrolaria* *Guenée*.

1857. GUENÉE, Spec. Gén., IX, 324, *Exelis*.

1860. WALKER, Cat. Lep. Het. Brit. Mus., XXI, 477, *Exelis*.

1867. PACKARD, Monogr. Geom., 565, *Exelis*.

*tensaria* Walker.

1862. WALKER, Cat. Lep. Het. Brit. Mus., XXVI, 1689, *Patridava*.

1895. HULST, Ent. News, VI, 103, = *pyrolaria*.

*approximaria* Packard.

1876. PACKARD, Monogr. Geom., 215, pl. IX, f. 40, *Tornos*.

1888. HULST, Ent. Am., IV, 50, = *pyrolaria*?

1895. HULST, Ent. News, VI, 103, = *pyrolaria*.  
*infumataria* Grote.  
1877. GROTE, Can. Ent., IX, 90, *Tornos*.  
1887. HULST, Ent. Am., III, 11, = *approximaria*.  
1895. HULST, Ent. News, VI, 103, = *pyrolaria*.

The generic characters will serve to separate this species from all others considered in this paper, especially when a female is in hand which is unique in the group in having pectinated antennæ. The close approximation of the median and extradiscal lines of the primaries in the region of the anal vein, a character which led Packard to apply the specific name *approximaria* to the species, will also aid in identifying this form.

The species is evidently not common being included in practically none of the many published local lists of Geometridæ. Grote records it from Texas and Packard from Kentucky. These apparently are the only definite localities published. I can add Kirkwood, Ga., July 6 and 12, and Lakeland, Florida, March 28 and May 5. From Texas I have seen perhaps a dozen specimens, some of which were taken in May. The species probably occurs throughout the Gulf States, and more rarely northward to the Ohio River.

Types: *Pyrolaria* was described from a single male in Boisduval's collection and is probably now with M. Oberthür at Rennes, France; *tensaria* also was described from a male which according to Hulst is in the British Museum; *approximaria* was named from two males and both specimens are in the Museum of Comparative Zoölogy at Cambridge; *infumataria* was apparently named from two females as Grote gives two dates, June 3 and 5; one of the specimens is in the British Museum but the other has not been located.

*Exelis* ? *fumida* Warren (Novit. Zool., XI, 581, 1904), described from a single male taken at South Park, Colorado, belongs to none of the groups considered here, but is referable to *Selidosema* as that genus is defined by Hulst. For an examination of this species I am indebted to Dr. K. Jordon of the Tring Museum, England, who through the kind offices of Mr. L. B. Prout, very generously loaned the unique type to me.

#### **Holochroa** Hulst.

1896. HULST, Trans. Am. Ent. Soc., XXIII, 352. Type, *dissociarius* Hulst.

***Holochroa dissociarius* Hulst.**1887. HULST, Ent. Am., II, 192, *Tornos*.1896. HULST, Trans. Am. Ent. Soc., XXIII, 352, *Holochroa*.

As with *Exelis pyrolaria* this species can be easily told by the strong generic characters. A good specific character however is found in the extra-discal line which beginning far out on the costa near the apex curves inwardly to a point on vein  $M_1$  near outer margin and then forming a very acute angle runs wavyly to far in on inner margin. In this regard it slightly approaches *Morina coniferaria*. It was described from a single male specimen, and no locality was given. The type at New Brunswick bears a California label. I have been able to identify three specimens from the Barnes collection with the species, a male from White Mountains, Arizona, and two females taken at Glenwood Springs, Colorado, July 1-7 and 24-30.



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