

A REVISION OF *GLAUCINA*,  
*SYNGLOCHIS*, AND *EUBARNESIA*  
(LEPIDOPTERA, GEOMETRIDAE)

FREDERICK H. RINDGE

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## INTRODUCTION

THE SPECIES COMPRISING the genus *Glaucina* and its immediate allies form a compact group within the Ennominae. One character that is common to all these species is the highly modified ovipositor lobes of the female genitalia. The lobes are very large and membranous, and have a row of elongate, capitate scales along the ventral margins on each side, becoming simple dorsally. The adults have a modified front, either with a central swelling or tubercle, or else the dorso-lateral areas are swollen. The wings are elongate, usually gray or brown, often with rather obscure cross lines and maculation. One result of the present study is that this group of moths should be given tribal status. As no term is available, the name *Glaucinini* is proposed.

The members of this tribe are to be found primarily in the more arid portions of the southwestern United States. They are commonly taken at light, often being one of the more numerous moths flying, so are usually fairly well represented in collections from that area. However, there always has been considerable difficulty in the proper application of names to these specimens. The desert areas of the western states have not been thoroughly collected, except for certain localities in the past, relatively few, years. The earlier workers in this group did not have nearly enough material on which to base their descriptions and studies, so it is not surprising that confusion has resulted in the taxonomy of this very difficult group. It is the purpose of this paper to try to reevaluate this group of moths, to try to answer some of the questions pertaining to its phylogeny, distribution, and taxonomy, and to propose a more satisfactory systematic arrangement of the species.

This study has shown the need for much more collecting, particularly in the Rocky Mountain states, the Great Basin area, Texas, and in all of northern Mexico. While the patterns of distribution and variation are relatively clear for certain species, much more work is needed, particularly in the above-mentioned areas, so that we can better understand the remaining species.

One of the many interesting questions that

needs to be answered is the reason for the modification of the ovipositor lobes. When the female genitalia are dissected, it is usual to find the area between the ovipositor lobes filled with what appears to be fine dirt. Whether or not this is an indication that the eggs are laid in the dirt at or near the base of the food plant remains to be proved. An even greater need is for life history work in this group. Of all the species included in this paper, the early stages of only one have been described, while two others have been reared so that at least the food plant is known. Rearing is badly needed to produce additional information as to the relationships of many of the species.

## MATERIALS AND METHODS

### MATERIALS STUDIED

This revision is based on a study of the specimens in some of the major eastern and western museums, the collection of the British Museum (Natural History), and the private collections of several individuals; these are referred to specifically under the section on acknowledgments. All the type specimens in this country have been studied by the author. The two types in the British Museum (Natural History) have not been personally examined, but, through the generous cooperation of Mr. D. S. Fletcher, the genitalia of those types have been studied and compared.

All the specimens studied during the preparation of this paper have had identification or type labels affixed. Consequently future workers will know just what was studied by the author. All too often such identification and labeling have not been done in the past, so there is always the question of whether or not certain specimens were in front of a revisor when he did his work. The specimens that have been photographed for this revision bear a typewritten "photo" label. In general, the adults and genitalia that are figured have been taken from the collection of the American Museum of Natural History. In such cases in which this was not practical, the fact is specifically noted. The following abbreviations have been used in the legends to the text figures and the plates:

A.M.N.H., the American Museum of Natural History  
B.M.N.H., British Museum (Natural History), London  
L.A.M., Los Angeles County Museum, Los Angeles  
U.S.N.M., United States National Museum, Washington, D. C.

In the preparation of this paper, 7601 specimens have been studied. A large number of genitalic slides were prepared by the author, who also had the preparations of Grossbeck, Sperry, and McDunnough at the American Museum of Natural History, of Clarke, Benjamin, and Capps of the United States National Museum, and of Cassino at the Museum of Comparative Zoölogy at Harvard College. In all, 916 genitalic slides were examined, including preparations of all the types. Grossbeck and the author also made 264 slide preparations of wings, legs, and antennae in the course of their revisionary studies.

#### DESCRIPTIONS

A binocular dissecting microscope was used throughout, when descriptions of the adults and genitalia were written. The same basic pattern of descriptions was followed throughout this paper for all specific descriptions. All species are characterized by a detailed description of the adult male, with comparative notes on the female, and full descriptions of the genitalia of both sexes are given, when both sexes are known.

#### GENITALIC FIGURES

The genitalia of each sex were drawn to the same scale and received a uniform reduction; however, the genitalic organs of the two sexes were not drawn to the same scale. Some caution must be taken in the use of these figures, especially with the males. The appearance of the valves varies to some extent depending on the degree to which the preparations are flattened. It is often necessary to make several dissections to obtain more or less exactly comparable mounts; when insufficient material is present this is sometimes not possible. Some of the apparent differences in the dissections studied, and in the figures, are a result of this discrepancy.

#### ACKNOWLEDGMENTS

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The author also wishes to thank Miss Marjorie Statham for the genitalic drawings and distributional maps, and Mr. Rudolph J. Schrammel for the photographic work included in this paper.

#### HISTORICAL BACKGROUND

As mentioned above, the members of this tribe occur primarily in the more arid regions of the southwestern states, an area that was poorly collected by the early workers, so it is not surprising that the first species was not described until 1877, by Grote. This was followed by several others in 1882 and 1883; Grote placed his six species in the genus *Tornos* Morrison. Both Druce and Strecker placed their single species in the genus *Eupithecia* Curtis. In 1896, Hulst erected *Glaucina*, *Coenocharis*, and *Synglochis*, and added two more species. From this time on, except for Strecker, all workers used the genera of Hulst. Pearsall named one species, and Dyar named nine between 1907 and 1915.



The one revisionary work on this group of moths was by Grossbeck in 1912, in his "Review of the species comprising the *Glaucina-Coenocharis* group." He straightened some of the confusion of the earlier names and was the first person to use and illustrate the male genitalia. In this paper, Grossbeck proposed nine new species. Previously, in 1910, Grossbeck had described *ritaria* as a new species, placing it in a new genus.

Following the Grossbeck revision, no further descriptions appeared for almost 10 years, when Cassino and Swett began describing new species. They proposed seven new ones between 1921 and 1925. This, except for some synonymic notes and illustrations of the adults by Barnes and McDunnough, completes the bibliographical background for this group.

### PHYLOGENY

The picture of the phylogeny of this tribe is not clear. Certain trends are evident, and these have led to the description of three monotypic genera and to the splitting of *Glaucina* into six species groups. As a result of this type of arrangement for the included species, it is believed that this entire tribe is of rather recent origin. The differences between most of the species within each group of *Glaucina* are usually quite small. Apparently the various species have not had the time to become morphologically well separated from one another.

### TAXONOMY

The determination of the adults in this tribe is not an easy matter, except for the proper generic placement. Species determination within the genus *Glaucina* is often very difficult, as the morphological differences between the species are often rather minute. One of the stumbling blocks to the proper application of specific names has been the type series of many of the earlier authors. In many cases these men included more than one specimen in their type series, and they did not actually designate a single type specimen. As most of the species of *Glaucina* are very similar to one another in color, maculation, and size, it was not uncommon to have more than one species included in the type series. Grossbeck did not designate lectotypes in his re-

vision, and very few had been selected prior to the present paper. In every case such designations have now been made, so that we have a more solid basis to define the various specific and subspecific categories.

Series of specimens of both sexes from a single locality are desirable when identification work is being done, as many of the moths are inclined to be rather variable. A good dissecting microscope is a necessity, as the nature of the front, the presence or absence of the tongue and the fore tibial spine-like process, and of the upper pair of hind tibial spurs are some of the characters that must be carefully studied. Very often genitalic dissections are also necessary for an accurate determination to be made. In this respect the males are usually more helpful than the females for specific characters, and keys are provided in this revision for nearly all the species based on these structures. The female genitalia have good group characters; on the specific level the differences are usually small and of a subtle nature. Consequently, great care must be exercised when working with the female dissections as an aid to specific determinations.

As a number of characters are common to the genera that are included in this paper, they are summarized here to avoid needless repetition in the generic descriptions. They are as follows:

Head, eyes large, round, as wide as, or slightly wider than, front; front subovoid, with lower margin truncate, with or without central tubercle; antennae of male strongly pectinate, the pectinations arising in the basal portion of the segments (except in *Eubarnesia*), of female simple or pectinate. Fore tibia with process about one-half as long as tibia, terminal margin with or without a single, spine-like projection; hind tibia not dilated but sometimes slightly enlarged distally, especially in the female, without hair pencil. Abdomen without crests; ventral surface of third segment without row of bristles in males, and eighth segment without plate. Forewings elongate, the apex produced so that outer margin is inwardly oblique, 11 veins, with or without a single areole;  $R_{1+2}$  from top of cell,  $R_{3+5}$  stalked, from top of cell midway between  $R_{1+2}$  and upper angle,  $R_5$  from stalk before  $R_3$ ;  $M_1$  from upper angle,

M<sub>2</sub> from slightly above middle of dc; Cu<sub>1</sub> from below lower angle; fovea absent or present. Hind wings elongate, apex produced, frenulum strong in both sexes; Sc approximate to, or anastomosed with, R along middle one-third of cell; R and M<sub>1</sub> from just before, at, or just beyond upper angle; M<sub>3</sub> from lower angle; Cu<sub>1</sub> from one-third or one-half of distance between angle and Cu<sub>2</sub>.

MALE GENITALIA: Uncus simple, elongate, subtriangular, tapering to apex from broad base; socius not differentiated; gnathos strongly developed, heavily sclerotized, with small median enlargement; valves moderately large, symmetrical, costal region sclerotized, usually extending beyond valvula, the remainder of valve mostly membranous, valvula undifferentiated or with elongate spine patch, sacculus simple, with an elongate sclerotized arm, or with an elongate spine patch; transtilla present, formed from basad extension of costal arms of valves; cristae absent; anellus sclerotized, variable in size and shape; furca absent; tegumen short and broad; saccus about equal in length to length of tegumen; aedeagus narrow, elongate; vesica armed with one or more, usually elongate, spinose cornuti or a sclerotized strip.

FEMALE GENITALIA: Ovipositor lobes very large, membranous, with a row of elongate, capitate scales along ventral margins on each side, becoming simple scales dorsally; sterigma with round or oval sclerotized plate; ductus bursae variable; corpus bursae membranous, rounded, usually elongate, signum present or absent. Segment VIII well sclerotized, often with dorsal surface narrower than preceding segment, with apophyses shorter than those of ovipositor lobes, and usually with tufts of elongate scales posteriorly and laterally beginning on each side of ostium.

## KEY TO GENERA

### BASED ON EXTERNAL MORPHOLOGY

1. Tongue rudimentary or absent . . . . . 2  
Tongue present . . . . . 3
2. Front flat or slightly swollen . . . . .  
. . . . . *Eubarnesia* Cockerell  
Front with elongate tubercle . . . . .  
. . . . . *Synglochis* Hulst
3. Accessory cell present in primaries; female antennae pectinate, the pectinations being longer than the segments . . . . .  
. . . . . *Paraglaucina*, new genus  
Accessory cell usually absent in primaries; female antennae simple . . . *Glaucina* Hulst

### BASED ON MALE GENITALIA

1. Valves with undifferentiated sacculus . . . 2  
Sacculus with spine patch or sclerotized arm. 3
2. Aedeagus shorter than combined lengths of uncus, tegumen, and saccus . . . . .  
. . . . . *Eubarnesia* Cockerell  
Aedeagus longer than combined lengths of uncus, tegumen, and saccus . . . . .  
. . . . . *Synglochis* Hulst
3. Sacculus with narrow spine patch . . . . .  
. . . . . *Paraglaucina*, new genus  
Sacculus with sclerotized arm, without spine patches . . . . . *Glaucina* Hulst

### BASED ON FEMALE GENITALIA

1. Ductus bursae a simple sclerotized tube, elongate, four to six times as long as wide, without longitudinal striations . . . . . 2  
Ductus bursae not as above . . . . . 3
2. Signum absent on corpus bursae . . . . .  
. . . . . *Eubarnesia* Cockerell  
Signum present on corpus bursae . . . . .  
. . . . . *Synglochis* Hulst
3. Ductus bursae about one-sixth of the length of the corpus bursae, sclerotized, not striated, the corpus bursae with a stellate signum . . . . .  
. . . . . *Paraglaucina*, new genus  
Ductus bursae and signum not as above . . . . .  
. . . . . *Glaucina* Hulst



## SYSTEMATIC DESCRIPTIONS

### GENUS *GLAUCINA* HULST

*Glaucina* HULST, 1896, Trans. Amer. Ent. Soc., vol. 23, p. 352. DYAR, "1902" [1903], Bull. U. S. Natl. Mus., no. 52, p. 323. J. B. SMITH, 1903, Check list of the Lepidoptera of boreal America, p. 76. GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 384. BARNES AND McDUNNOUGH, 1917, Check list of the Lepidoptera of boreal America, p. 116. McDUNNOUGH, 1938, Check list, pt. 1, p. 162.

*Coenocharis* HULST, 1896, Trans. Amer. Ent. Soc., vol. 23, p. 353. DYAR, "1902" [1903], Bull. U. S. Natl. Mus., no. 52, p. 323. J. B. SMITH, 1903, Check list of the Lepidoptera of boreal America, p. 76. GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 392. BARNES AND McDUNNOUGH, 1917, Check list of the Lepidoptera of boreal America, p. 116. McDUNNOUGH, 1938, Check list, pt. 1, p. 162. New synonymy.

*Caenocharis* (*sic!*), DYAR, 1913, Proc. U. S. Natl. Mus., vol. 44, p. 309; 1917, *ibid.*, vol. 51, p. 30.

In addition to the characters noted for the tribe: Head, front variable, either with a large, broad, flat, central tubercle with the boundaries of front delimited by a more or less sharply defined ridge, or with dorsolateral areas swollen to form two converging ridges, the front rough-scaled and in some specimens with closely appressed scales; antennae of 32 to 44 segments, apex of male simple, of female simple, with a pair of setae at end of each segment; tongue present; labial palpi well developed, heavily scaled, not attaining middle of eyes, middle segment not extending beyond front of eyes, terminal segment longer than high. Thorax without tufts; fore tibia having terminal margin usually with or without a single, spine-like projection; hind tibia with two pairs of spurs, rarely reduced to one. Forewings usually without areole, although sometimes a weak cross vein is present to form a cell; fovea present in male, weakly developed or absent in female; gray, shaded with brown or white above, usually with two cross lines and discal spot, but maculation obsolescent in some; secondaries usually lighter in color than primaries, with discal dot and a partial extradiscal line often present. Beneath light gray, the secondaries lighter than primaries, without cross lines, and with discal dots obsolescent.

**MALE GENITALIA:** Uncus elongate, the apex laterally compressed and with a single point, bifid in one species; gnathos in some specimens forming a small, median enlargement; valves with costal region produced apically and with numerous setae near end, the valvula undifferentiated, sacculus with a sclerotized arm of varying length, either terminating in a free, tapering, spine-like projection or with apical portion of sacculus covered with from two to many short spines, the valve with a sclerotized strip across base next to saccus connecting costa and sacculus; anellus rather small; tegumen without setae on dorsal surface; saccus projecting short distance beyond base of valves, broadly rounded or bluntly pointed, longer than length of uncus; aedeagus usually shorter than combined lengths of tegumen and saccus; vesica armed with an elongate sclerotized spine, or sclerotized, dentate strip.

**FEMALE GENITALIA:** Ductus bursae sclerotized, in some specimens with longitudinal striations, of variable length, in others not clearly differentiated from corpus bursae; ductus seminalis minute, arising ventrally from posterior region of ductus bursae; corpus bursae as long as, or longer than, length of ductus bursae, with variously shaped signum present.

**EARLY STAGES:** Unknown except for the description of the larva of one species in southern California.

**TYPE SPECIES:** *Tornos escaria* Grote for *Glaucina*, and *Tornos interruptaria* Grote for *Coenocharis*; both by original designation.

**DISTRIBUTION:** The moths of this genus are found primarily in the semi-arid regions of the southwestern United States, from Texas to southern California. They are found northward in Colorado, Utah, Nevada, Oregon, Washington, Wyoming, and Idaho, and extend southward into Mexico as far south as Michoacan and Puebla.

### KEY TO SPECIES GROUPS

#### BASED ON EXTERNAL MORPHOLOGY

1. Hind tibia with one pair of spines, and fore tibia without terminal spine-like projection . . . . . group III  
Hind tibia with two pairs of spines; if only one, then terminal spine-like projection

- present on fore tibia . . . . . 2
- 2(1). Front with central tubercle . . . . . 3  
Front without central tubercle, but with  
dorsolateral areas swollen . . group IV
- 3(2). Fore tarsus swollen, terminating in an  
elongate, heavy spine . . . . group V  
Fore tarsus normal, not swollen . . . . 4
- 4(3). Front with a low, broad tubercle occupying  
most of front, not having a well-defined  
depression surrounding the tubercle; long-  
est pectinations of male antennae about  
seven to nine times as long as antennal  
segments . . . . . group II
- Front with distinct, raised tubercle sur-  
rounded by depression; longest pectina-  
tions of male antennae not more than five  
times as long as antennal segments. . .  
. . . . . group I

#### BASED ON MALE GENITALIA

1. Sacculus with very long, slender, evenly  
curved, spine-like process that is longer  
than length of costa . . . . . group III  
Sacculus not as above . . . . . 2
- 2(1). Sacculus with a narrow, sclerotized arm  
terminating in a slender, spine-like pro-  
cess, shorter than length of costa . group I  
Sacculus arm not as above, terminating in  
two or more short spines . . . . . 3
- 3(2). Sacculus arm straight, either tubular or  
flattened and swollen apically . group IV  
Sacculus arm twisted apically . . . . . 4
- 4(3). Width of base of uncus equal to length of  
uncus; sacculus arm terminating in three  
spines . . . . . group II  
Width of base of uncus about one-half of  
length of uncus; sacculus arm terminally  
with many spines . . . . . group V

#### GROUP I

This is the typical group of the genus. It can be recognized by the fact that the front is higher than wide and has a large, well-defined, central tubercle, and the forelegs usually have a well-developed, spine-like projection at the distal end of the tibia. The forewings may or may not have a fovea. In the male genitalia the vesica is armed with a single large cornutus, is bifurcated basally and tapers to a point posteriorly, and the sacculus has a narrow, sclerotized arm terminating in a long, usually single, spine-like process. The female genitalia has a well-sclerotized round or ovate lamella postvaginalis, a well-defined ductus bursae with numerous longitudinal striations and a trans-

verse signum with dentate margins, in most specimens large but in a few reduced.

An unique feature of the female genitalia is the presence of a pair of membranous invaginations on each side of the genital openings, arising from a more or less sclerotized base. They are of specific importance, as they vary in size and shape among the species. The function of these sacs is unknown. Apparently they had their origin in the intersegmental membrane, and are now found adjacent to the sclerotized venter. It is believed that they may have originated from the pressure, during copulation, of the sclerotized, spine-like process at the end of the sacculus arm against the intersegmental area, resulting in this invagination. Observations of the copulation of these moths are needed in order to determine whether or not the spine-like processes are inserted into these sacs.

The species of this group range, in size, from the smallest to among the largest in the genus. Two cross lines and the discal dot are usually present on the forewings, although they may be obsolescent or absent. Group I is characterized by the presence of sexual dimorphism in the maculation and, to a lesser degree, in the color of the wings. This point was not recognized by some of the earlier workers, and it has led to considerable confusion as to the proper association of the sexes. The males tend to have the primaries with relatively weak maculation and unicolorous secondaries, while the females are often slightly lighter in color, with more prominent maculation on the forewings, and have a broad terminal band on the secondaries.

Group I consists of 10 species, with one of these being divided into several subspecies. The distribution of this group is concentrated in desert areas of Arizona and California, with some of the species ranging into Nevada, Utah, New Mexico, and Texas in the United States, and into Baja California, Sonora, and Durango in Mexico.

#### KEY TO SPECIES BASED ON MALE GENITALIA

1. Sclerotized arm of sacculus a simple, curved structure, without median swelling. . . 2  
Sacculus arm with median swelling, or with shoulder-like swelling where broadened basal area extends distally up arm . . 5

- 2(1). Terminal process becoming wider after leaving sacculus arm, and being almost as long as arm . . . . . *utahensis*  
Terminal process narrower and shorter than sacculus arm . . . . . 3
- 3(2). Sacculus arm straight, curving at apex, the terminal process curving to form a right angle with sacculus . . . . . *cilla*  
Sacculus arm slightly C-shaped, the terminal process continuing straight from end of arm . . . . . 4
- 4(3). Sacculus with a lightly sclerotized structure arising from base of arm and extending posterodistally and medially one-half to three-fourths of length of sacculus arm . . . . . *erroraria*  
Sacculus with distal end of this structure curving outward and extending beyond origin of terminal process . . . *biartata*
- 5(1). Sacculus arm with an outer, lightly sclerotized, sheath-like structure extending from median swelling to base of terminal process . . . . . 8  
Sacculus arm without sheath-like structure, but with lightly sclerotized striations on face of valve instead . . . . . 6
- 6(5). Sacculus arm with sharply defined, shoulder-like swelling, in width at least twice as wide as apical portion of sacculus arm . 7  
Sacculus arm with slight median swelling, without much difference in width between basal and apical portions of arm . . . . . *macdunnoughi*
- 7(6). Terminal spine-like process continued straight from sacculus arm, in length one and one-half times as long as distal portion of arm . . . . . *epiphysaria*  
Terminal spine-like process continued at an angle from arm, in length twice as long as distal portion of arm . . . . . *baea*
- 8(5). Distal portion of sacculus arm straight, with terminal spine-like process slightly S-shaped . . . . . *escaria*  
Distal portion of sacculus arm slightly curving outward at junction with spine-like process, the latter curved at base, then straight . . . . . 9
- 9(8). Terminal portion of sacculus arm slightly narrower than shoulder-like swelling of sacculus . . . . . *eupetheciaria*  
Terminal portion of sacculus arm about one-half as wide as shoulder-like swelling . . . . . *elongata*

*Glaucina erroraria* Dyar

Plate 23, figures 1-4; text figures 1, 2, 19, 38, 74

*Tornos escaria* GROTE, 1882, Canadian Ent., vol. 14, p. 186 (*partim*). RINDGE, 1955, Bull.

Amer. Mus. Nat. Hist., vol. 106, p. 142.

*Coenocharis elongata* HULST, 1896, Trans. Amer. Ent. Soc., vol. 23, p. 353 (*partim*).

*Glaucina erroraria* DYAR, 1907, Jour. New York Ent. Soc., vol. 15, p. 106. GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 385. BARNES AND McDUNNOUGH, 1916, Contributions to the natural history of the Lepidoptera of North America, vol. 3, p. 183; 1918, *op. cit.*, vol. 4, p. 151, pl. 22, fig. 14. W. S. WRIGHT, 1920, Bull. Amer. Mus. Nat. Hist., vol. 42, p. 487.

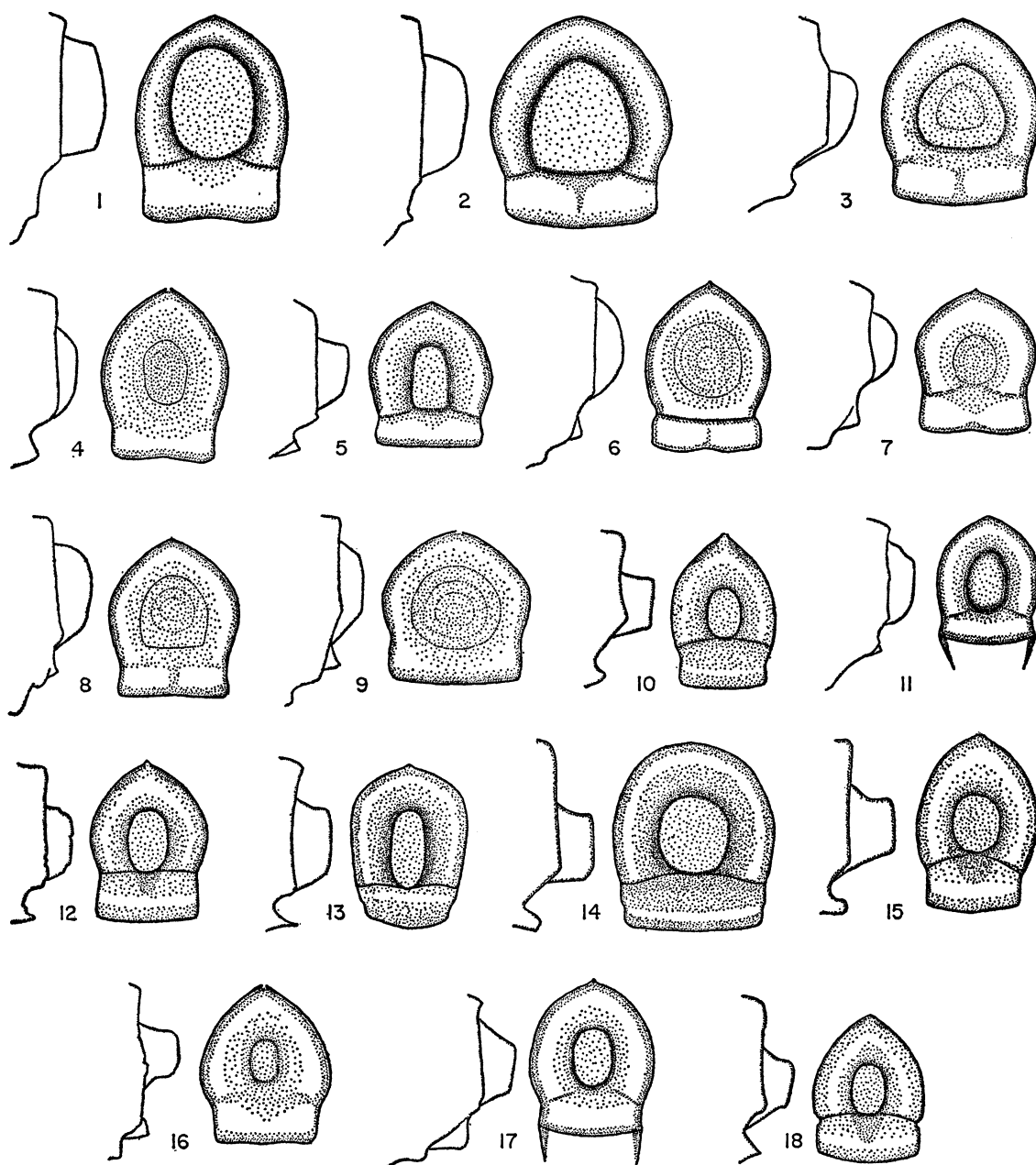
*Glaucina pearsalli* GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 387, fig. 4 (male genitalia). New synonymy.

*Glaucina abdominalis* GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 388. New synonymy.

*Glaucina bilineata* GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 389. New synonymy.

MALE: Head, vertex and front with a mixture of grayish white, dark gray, and pale brown scales, the darker scales white-tipped, with front tending to be slightly darker than vertex; front subovoid in outline, with lower margin truncate, with a prominent, narrow, outer rim, a well-defined groove basad of rim, more depressed along lower margin than along lateral margins, and with a prominent central tubercle with a more or less broadly flattened apex, extending forward beyond lateral margins of front, similar in shape to outline of front, and occupying about three-fifths of length and one-half of width of front; palpi reaching front or slightly beyond, dark gray or brown, with the scales white-tipped; antennae with 41 to 44 segments. Thorax dark gray, gray-brown, or light brown above, grayish white below; legs grayish white, with variable amounts of dark gray or brown scaling, with the tibiae dark-scaled except for ends of segments; fore tibia with process arising basad of middle of segment, with terminal spine-like projection twice as long as width of tibia. Abdomen with a mixture of grayish white and dark gray, gray-brown, or light brown scales above and below, in some specimens with a double dorsal line and a single ventral line indicated by darker scales.

UPPER SURFACE OF WINGS: Forewings with ground color varying from dark gray to light gray or buff, unicolorous, with maculation varying from distinct to obsolescent,



FIGS. 1-18. Lateral (left) and frontal (right) views of the head. 1, 2. *Glaucina erroraria* Dyar. 1. Male, paratype of *pearsalli* Grossbeck. 2. Female. 3. *G. biartata*, new species, holotype male. 4. *G. utahensis* (Cassino and Swett), male. 5. *G. cilla*, new species, holotype male. 6, 7. *G. macdunnoughi* (Grossbeck). 6. Male. 7. Female. 8, 9. *G. epiphysaria* Dyar. 8. Male. 9. Female. 10-12. *G. baea*, new species. 10, 11. Paratype males. 12. Paratype female. 13, 14. *G. escaria* (Grote). 13. Male. 14. Female. 15-18. *G. eupetheciaria eupetheciaria* (Grote). 15. Male. 16-18. Females.

usually strongest on veins; t. a. line, when distinct, dark, arising on costa about one-third of distance from base at right angle, looping sharply outward in cell, turning basad on cubital vein, often with black scales continuing basad as a tooth on this vein, continuing obliquely inward to meet inner margin about three-tenths of distance from base; discal dot usually weakly represented; t. p. line, when distinct, dark, arising on costa three-fourths of distance from base, with slight basal bend opposite cell, convex below this, and with stronger basal bend in cubital cell, the line concave in cells, darkest and with short, outwardly projecting teeth on veins; s. t. line absent, in some specimens weakly indicated by a change in color in this area; terminal line dark, complete; fringe concolorous with wing or slightly lighter. Hind wings white, in some lightly dusted with gray scales, the anal margin suffused with gray; maculation absent except for weakly defined discal dot and an incomplete extradiscal line; terminal line and fringes as on primaries.

**UNDER SURFACE OF WINGS:** Ground color of both wings white or light grayish white, with a few scattered dark scales, especially along costa of primaries; maculation absent except for diffuse discal dots on all wings and a narrow terminal line; fringe concolorous with wing.

**LENGTH OF FOREWING:** 12 to 18 mm.

**FEMALE:** Front with tubercle slightly smaller than in male, about one-half of the length of the front; fore tibia with process arising at center of segment, and with terminal spine-like projection twice as long as width of tibia.

**UPPER SURFACE OF WINGS:** Forewings with ground color averaging slightly lighter than in males, with a tendency for the subterminal and terminal areas to be darker than basal portion of wing; maculation as in male, in some specimens more distinct, with a tendency for a stronger discal dot. Hind wings white or light gray at base, with outer portion of wing usually broadly dark gray, contrasting.

**UNDER SURFACE OF WINGS:** Ground color of both wings white or grayish white, with outer portion of both wings tending to become dark gray; discal dots prominent.

**LENGTH OF FOREWING:** 14 to 18 mm.

**MALE GENITALIA:** Uncus triangular in outline, with width of base slightly less than length of uncus, the apex curved ventrally, terminally truncate; gnathos with small median enlargement, apically pointed or rounded; valves broad, indented apically to join costa; costa of even width to apex, concave beyond base, angled outward about two-thirds of distance from base, with median swelling on ventral surface extending to, and becoming stronger at, apex, the posterior surface of apex thickly beset with slightly curved, spine-like hairs; sacculus arm very long and narrow, tubular, of even width, slightly C-shaped, terminal spine-like process slender, about one-half as long as arm, with a thin, sclerotized piece extending from sclerotized area at base of valve to base of sacculus arm and slightly beyond, tapering to a point, anterior of this, from below base of arm, in inner face of valve, a curving, lightly sclerotized area of even width, with a few longitudinal striations, extending to about middle of arm, going under arm and in some specimens produced medially and anteriorly in basal part of valve; base of valve with sclerotized band, widened at junctions with costa and broadly sclerotized base, slightly curved medially; anellus connecting sclerotized sacculus bases, extending posteriorly as tapering, median juxta, length shorter than width of base, terminally with small dorsal ridge; aedeagus slender, of even width, in length slightly shorter than combined lengths of tegumen and saccus; vesica with a single, elongate, sclerotized cornutus, tapering from basal portion or center, shallowly bifurcated basally, slightly longer than one-half of length of aedeagus.

**FEMALE GENITALIA:** Sterigma with circular, well-sclerotized lamella postvaginalis, bordered laterally by several sclerotized folds and anteriorly by a narrow, shallowly U-shaped, sclerotized band or ridge; ductus bursae with a small, well-sclerotized, narrow, collar-like structure, about one-half of width of lamella postvaginalis, the ductus bursae itself well sclerotized, longitudinally striated, in length shorter than length of apophyses posteriores; corpus bursae membranous, rounded; signum prominent, transverse, spinose. Membranous invaginations of inter-



segmental membrane between  $A_7$  and  $A_8$  very large, at least two-thirds as long as apophyses posteriores, with membranous base.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPES: Dyar described *erroraria* from four specimens, one of these being a type specimen of *elongata* Hulst from Arizona. Barnes and McDunnough (1916, 1918) speak of the type as the female from Hot Springs, Arizona (Schwarz), but it is doubtful that this can be construed as a lectotype designation. The specimen in the type collection of the United States National Museum is labeled Tucson, Arizona, July 19 (E. A. Schwarz), female genitalia on slide November 2, 1936, J.F.G.C. number 721; this specimen is hereby designated as the lectotype of *erroraria*.

Grossbeck described *pearsalli* from four males, and these specimens are in the collection of the American Museum of Natural History. The lectotype is hereby designated

as the specimen labeled by Grossbeck as the male type, from Parker, Arizona, March 12, 1909.

The holotype and cotype of *abdominalis* are in the collection of the American Museum of Natural History; both these specimens are males.

Grossbeck described *bilineata* from a single female, and this type specimen is in the United States National Museum collection.

The single "type" female of *escaria* from the Hulst collection is referable to *erroraria*, not *escaria*.

TYPE LOCALITIES: Tucson, Pima County, Arizona (*erroraria*); Parker, Yuma County, Arizona (*pearsalli*); San Diego, San Diego County, California (*abdominalis*); Redington, Pima County, Arizona (*bilineata*).

RANGE: Western Texas, southern New Mexico, southern and western Arizona, southern Utah, southern Nevada, and southern California; in Mexico *erroraria* is known

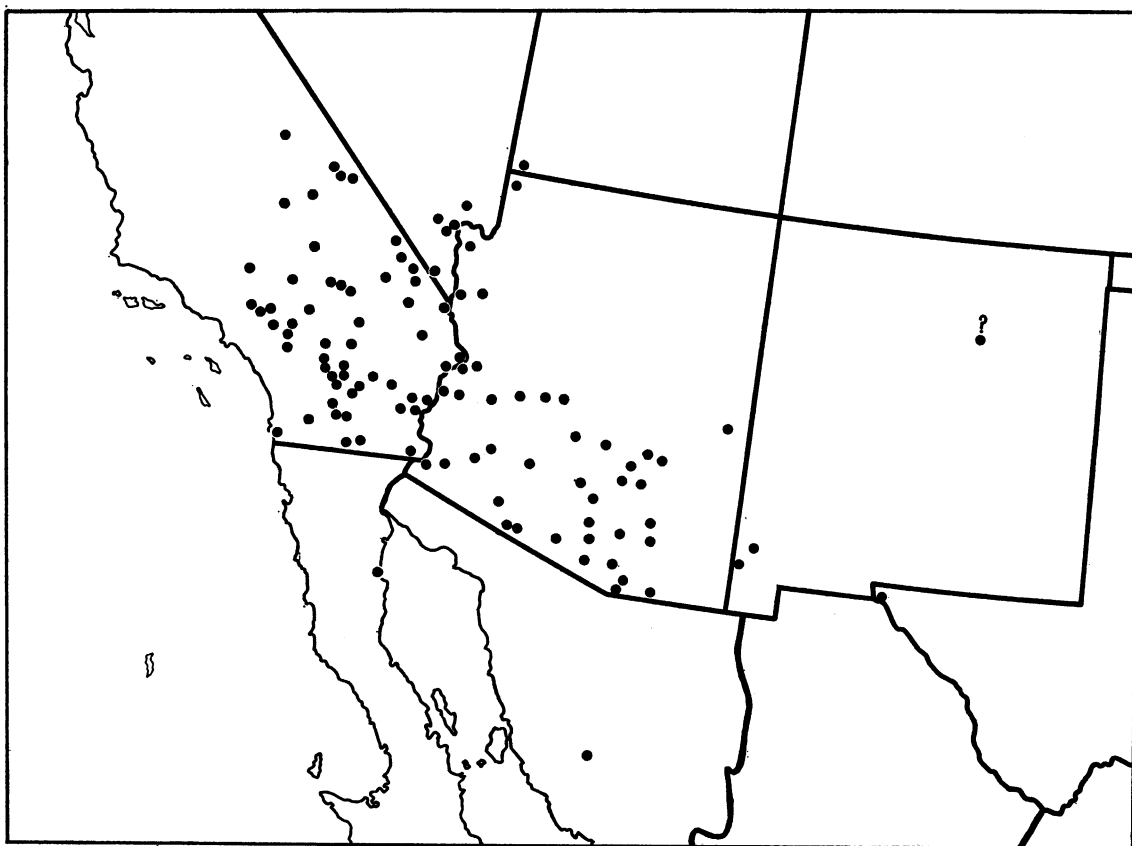


FIG. 19. Distribution of *Glaucina erroraria* Dyar.

from northeastern Baja California and Sonora. (See fig. 19.) On the wing during every month of the year. There is a single female labeled "Sapello Canon, N. Mex., 7-26 (Oslar)." This locality is in the mountains of San Miguel County in northern New Mexico. This record is indicated by a question mark on the map, as it is considered to be dubious.

REMARKS: One thousand two hundred and eighty-four specimens and 109 genitalic preparations were examined, including those of all the types. Throughout most of its range, males of this species are fairly constant in color and size, although some variation occurs in the amount of maculation on the primaries. The females tend to be more variable, both in color and maculation, as the cross lines may vary from being completely absent to very prominent. One of the most noticeable variations occurs in San Diego County, California, where the specimens tend to have the ground color of the primaries above lighter and with less gray than do other populations, including the population of adjacent Riverside County. While the color is usually buff, occasional gray specimens occur that are indistinguishable from examples from other areas. The grayer specimens are usually dated from November through March, April, or as late as May, while summer and fall examples tend to be more sand-colored. The lighter-colored specimens also tend to have a reduction in the outer band of the secondaries, and in some examples it is completely lost. It is not thought that this population is deserving of a name, but, if one should be needed, *abdominalis* Grossbeck is available. Some of the specimens from southern Arizona, especially Pima County, tend to be smaller and darker than those from neighboring areas. The primaries tend to be of a more uniform color, with usually prominent cross lines. Once again it is not believed that this is a population worthy of a subspecific name, but, if one should be needed, *bilineata* Grossbeck is available.

This species is one of the easier ones to recognize. It is the largest species having the front with a tubercle. Additional diagnostic features include the relatively light and even coloration of the primaries, and the secondaries of the males are white, while those of the females usually have a broad dark border.

This species has antennae with a greater number of segments than in *escaria*, and the structure of the front is also different, as *erroraria* does not have the outer lip enlarged dorsally near the midline as in *escaria*.

The male genitalia of *erroraria* can be recognized by the very long, simple, and curved sacculus arm terminating in a thinner spine-like process. The female genitalia can usually be recognized by the large and elongate membranous invaginations on each side of the genital opening.

#### *Glaucina biartata*, new species

Plate 23, figures 5, 6; text figures 3, 20, 39, 75

MALE: Head, vertex and front gray-brown, the scales white-tipped; front with apex bluntly pointed, broad, widest about the middle, slightly constricted above truncate base, with a prominent, narrow, outer rim, a well-defined groove basad of rim, more depressed along lower margin than along lateral margins, and with central tubercle broadly swollen, rounded, and occupying most of the area of the front; palpi extending to front, gray-brown, with white-tipped scales. Thorax gray-brown above, paler below; legs gray-brown, with some dark brown scaling; fore tibia with process arising basad of middle of segment, with terminal spine-like projection elongate, its length being equal to one and one-half times the width of tibia. Abdomen grayish brown above and below.

UPPER SURFACE OF WINGS: Forewings similar to those of *erroraria*; ground color dark gray, unicolorous, heavily and evenly overlain with brown-black scales, without maculation, except for a concentration of brown-black scales on the veins, especially along lower margin of cell and in region of t. p. line; terminal line narrowly represented; fringe concolorous with wing. Hind wings grayish white, lightly suffused with pale brown scales distally, the anal margin with numerous gray and brown-black scales; maculation absent; terminal line dark, narrow; fringe white, becoming darker near anal angle.

UNDER SURFACE OF WINGS: Ground color of all wings light, shining gray, somewhat suffused with light and dark brown scales, these tending to be slightly concentrated along costa of forewings; both wings without macu-

lation, the veins of primaries tending to be slightly darkened; terminal line and fringes as above.

LENGTH OF FOREWING: Holotype, 15 mm.

FEMALE: Front with tubercle slightly smaller than in male, about one-half of the length of front; antennae with 40 to 42 segments; fore tibia with process arising at center of segment, and with terminal spine-like projection one and one-half times as long as width of tibia.

UPPER SURFACE OF WINGS: Forewings with ground color lighter than in male, with a tendency for the subterminal and terminal areas to be darker than basal portion of wing; t. a. and t. p. lines present, black or blackish brown, complete or represented by venular spots, more or less connected; t. a. line arising on costa about three-tenths of distance from base at right angle to costa, extending outward in cell, then going straight to inner margin, three-tenths of distance from base; distal dot absent or weakly suggested; t. p. line arising on costa almost three-fourths of distance from base, with slight basal band opposite cell and a slightly stronger one in cubital cell, when complete the line concave in cells. Hind wings white or pale grayish white, with a broad, dark gray or grayish brown border, only slightly narrower than central pale area; fringe contrasting, as in male.

UNDER SURFACE OF WINGS: Ground color of forewings as in male, tending to become slightly darker distally; without maculation, or with trace of discal dot. Hind wings pale grayish white basally, with a broad, dark border, as above; fringe contrasting.

LENGTH OF FOREWING: 13 to 15 mm.; allotype, 15 mm.

MALE GENITALIA: Similar to those of *erroraria*; valve with deeper apical indentation to costa; costa with less pronounced concavity and angle on outer margin; sacculus arm very long and narrow, tubular, slightly thickened and angled medially, tapering distally, terminal spine-like process slender, tapering, about one-fourth of length of arm, sclerotized base of valve extending part way up base of sacculus arm, continuing distally as partially sclerotized area, turning posteriorly, becoming flattened and more heavily sclerotized, passing below sacculus arm and then curving outward, terminating in a point shortly dis-

tad of origin of terminal spine-like process; juxta short, with median line, continued posteriorly as lightly sclerotized, finely pitted area; aedeagus with evenly tapering cornutus, with deeply bifurcated base, the right side shorter than left at base.

FEMALE GENITALIA: Similar to those of *erroraria*; sterigma with slightly ovate lamella post-vaginalis, bordered by several sclerotized folds, especially laterally and anteriorly, and by a sclerotized anterior strip with a ventrally projecting lip; ductus bursae with a small, square or rectangular, collar-like structure, length of ductus bursae slightly shorter than length of apophyses posteriores; corpus bursae membranous, rounded; signum prominent, transverse, spinose, in some individuals somewhat weakly so. Membranous invaginations of intersegmental membrane broad, as wide as ductus bursae, arising from elongate, sclerotized base, with small, median, ventral ridge at opening, the sacs convoluted.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPES: Holotype, male, Rosario, Baja California, March 6, 1935, *ex* collection of V. H. dos Passos; allotype, female, Santo Tomas, Baja California, July 8, 1953 (W. J. and J. W. Gertsch). Paratypes, four females, 2 miles east of San Simon, Baja California, September 8-9, 1955 (J. A. Comstock); two females, San Simon, Baja California, September 8-9, 1955 (J. McKenney); one female, San Diego, San Diego County, California, June 28, 1924. Holotype and allotype in the collection of the American Museum of Natural History; paratypes in the collections of that institution, of the Los Angeles County Museum, and of the Department of Entomology and Parasitology, University of California, Berkeley.

RANGE: Western Baja California Norte and the adjacent San Diego County of California. (See fig. 20.) On the wing in March, June, July, and September.

REMARKS: Nine specimens and five genitalic preparations were studied. This species is an ally of *erroraria*, but can be separated from that species by its smaller size, by the smaller number of segments in the antennae, by the slightly more grayish secondaries of the male, and, in the female, by the grayer forewings, with more sharply defined macula-

tion, together with the strongly bicolored secondaries.

From the limited material available, there is an indication of some seasonal dimorphism in the coloration of the upper surface of the wings in the females. The two females taken in June and July have almost unicolorous grayish brown forewings, while the four specimens captured in September are a lighter, more grayish color, with the area distad of the t. p. line dark gray and contrasting.

The male genitalia show a close relationship to those of *erroraria*. An elongate and simple sacculus arm is present in *biartata*, but it tends to be slightly thickened and angled medially, rather than having the C-shape found in *erroraria*. The sclerotized structure coming from the base of the arm is diagnostic, as it parallels the sacculus arm, turning outward near the edge of the valve, thus being more elongate and of a shape different from that found in *erroraria*. The female genitalia are also closely allied to those of *erroraria*. The present species can be separated from the preceding one by the more ovate lamella postvaginalis, by the ventrally projecting lip on the strip ventrad to the collar of the ductus bursae, and by the fact that the apparently shorter, convoluted membranous sacs arise from an elongate base and have the ventral ridge at the opening.

***Glaucina utahensis* (Cassino and Swett)**

Plate 23, figures 7, 8; text figures 4, 20, 40, 76

*Coenocharis utahensis* CASSINO AND SWETT, 1921, *Lepidopterist*, vol. 4, pp. 30, 31 (illustration of male genitalia).

*Glaucina utahensis*, McDUNNOUGH, 1945, *Canadian Ent.*, vol. 77, p. 66.

**MALE:** Head, vertex and front grayish brown, the scales white-tipped, in some specimens with scattered white or grayish scales; front with apex bluntly pointed, broad, truncate base as wide as middle, with a prominent, narrow, outer rim, narrowly interrupted dorsally and often slightly swollen laterally thereto, a well-defined groove basad of rim, more depressed along lower margin than along lateral margins, and with central tubercle prominent, rounded, higher than wide, occupying slightly more than one-half of height and from one-third to one-half of width, extending forward be-

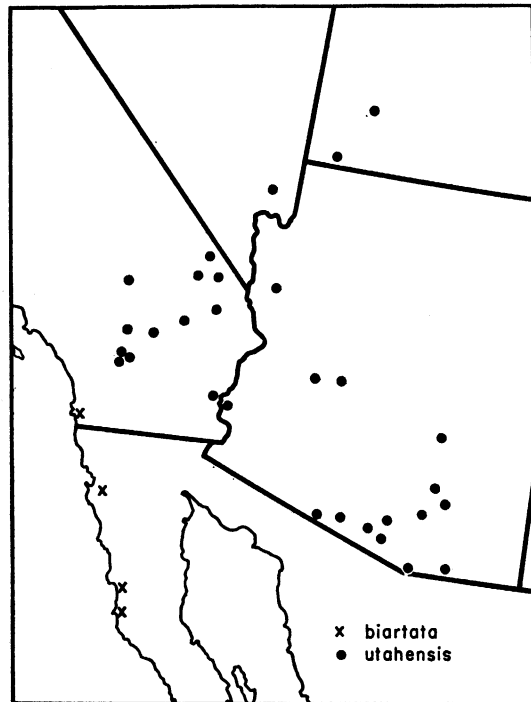


FIG. 20. Distribution of *Glaucina biartata*, new species, and *utahensis* (Cassino and Swett).

yond lateral margin of front by a distance less than that between the anterior edge of eye and lateral margin; palpi reaching front or slightly beyond, grayish brown, with white-tipped scales; antennae with from 36 to 39 segments. Thorax pale grayish brown, the scales white-tipped, white or grayish white below; legs grayish white, more or less heavily scaled with brown or blackish brown, the tibiae dark-scaled except for ends of segments; fore tibia with process arising basad of middle of segment, with terminal spine-like projection one and one-half to two times as long as width of segment. Abdomen with a mixture of grayish white, grayish brown, and black scales, the last sometimes concentrated dorsally on segments 2 and 3.

**UPPER SURFACE OF WINGS:** Forewings with ground color gray, heavily and evenly overlain with brownish black or black scales, producing a unicolorous dark gray or grayish black, with obscure or no maculation; t. a. line absent or very faint, when present arising on costa about one-third of distance from base, angled outward in cell, then subparal-

leling outer margin to inner margin, often with slight basal bends on veins and in cubital cell; discal dot weakly represented or absent; t. p. line weakly indicated or absent, when present arising on costa about four-fifths of distance from base, with slight basal bend opposite cell, outwardly produced on veins  $M_3$ ,  $Cu_1$ , and  $Cu_2$ , and with strong concave loop in cell  $Cu_2$ , the line concave between veins, in some individuals faintly shaded distally with ground color; subterminal and terminal areas concolorous with basal part of wing, in some slightly darker; s. t. line absent, or faintly indicated as pale, narrow line; terminal line dark, varying from being complete to having intravenular dots only; fringe concolorous with wing. Hind wings white, with a faint roseate reflection in certain lights, with scattered, pale, grayish brown scales along costal margin and occasionally on outer margin, the anal margin gray, with black or black-brown scales; without maculation, although discal dot may occasionally be present; terminal line dark, in some specimens fading out anteriorly; fringe white, the outer portion in some darkened opposite anal angle.

**UNDER SURFACE OF WINGS:** Forewings gray, overlain with dark gray and grayish brown scales, especially along outer portions of the wing; hind wings white, with scattered grayish brown scales along costal and anal margins; all wings without maculation except for discal dots on primaries; terminal line brown, in some specimens narrowly interrupted by veins; fringes as above, except for some basal white scaling on primaries.

**LENGTH OF FOREWINGS:** 8 to 12 mm.

**FEMALE:** Front slightly broader, with tubercle as large as or larger than in male, the tubercle having more sloping sides, extending slightly farther outward; fore tibia with process arising at center of segment, and with terminal spine-like process twice as long as width of tibia.

**UPPER SURFACE OF WINGS:** Forewings similar to those of male, slightly less heavily overlain with dark scales except for subterminal and terminal areas; maculation weak, slightly better defined than in male; discal dot usually present. Hind wings white or pale grayish white, more heavily overlain with

grayish brown and brown scales, these covering most of wing except cell, producing a dark-bordered wing; fringe contrasting, as in male.

**UNDER SURFACE OF WINGS:** Similar to those of male, but with secondaries more heavily overlain with dark scales, as above.

**LENGTH OF FOREWING:** 9 to 12 mm.

**MALE GENITALIA:** Similar to those of *erroraria*; valve with rather deep apical indentation to costa; costa with base slightly swollen, concave near center, strongly angled at two-thirds of distance from base; sacculus arm arising in center of valve from distal extension of sclerotized base, short, tubular, of even width or slightly swollen medially, slightly narrowed at apex, C-shaped, terminal spine-like process elongate, in length subequal to length of sacculus arm, continuing in same direction as end of arm, widening after leaving arm, than tapering to a slender point; a flat, sclerotized piece extending distally from base of arm, with a striated area from base of valve, curving posteriorly, extending along arm as a flattened, sclerotized piece, curving outward near junction of arm and process; base of valves with narrow, slightly curved band, arising from inner portion of widened area in costa; juxta diamond-shaped, terminally with a well-defined dorsal ridge; vesica with evenly tapering cornutus, the base bifurcate.

**FEMALE GENITALIA:** Similar to those of *erroraria*; sterigma with lamella postvaginalis rounded, often with sides extended to produce a somewhat diamond-shaped structure, bordered laterally and anterolaterally by several sclerotized folds, and anteriorly by a well-defined, narrow, slightly curving, sclerotized band; ductus bursae with a small, collar-like structure, about one-third of width of lamella postvaginalis, the ductus lightly sclerotized; corpus bursae membranous, rounded, with prominent signum, transverse, elongate to ovate, strongly to finely spinose. Membranous invaginations of intersegmental membrane arising from elongate, sclerotized base, with ventral median ridge at opening, the sacs narrower than ductus bursae, about two-thirds as long as apophyses posteriores.

**EARLY STAGES:** Unknown.

**FOOD PLANT:** Unknown.



**TYPES:** Holotype, male, and allotype, female, in collection of the Museum of Comparative Zoölogy at Harvard College, and bearing their type number 16896. Some of the paratypes of this species are *Synglochis perumbraria* Hulst.

**TYPE LOCALITY:** St. George, Washington County, Utah.

**RANGE:** Southwestern Utah, southern Nevada, and southeastern California and southern Arizona. A single specimen labeled "Texas" has been studied; this state record needs to be verified. (See fig. 20.) On the wing from February through September.

**REMARKS:** One hundred and twenty-four specimens and 29 genitalic preparations were studied. The male of *utahensis* somewhat resembles a small, dark male of *erroraria*. In length of forewing, this species ranges from 8 to 12 mm., while *erroraria* expands from 12 to 18 mm. The upper surface of the forewings of *utahensis* are darker and more immaculate than are those of *erroraria*, while the secondaries of the present species tend to have a faint rosy reflection that is not found in the other species. The contrast of the dark primaries with the shiny white secondaries of the male is a good distinguishing character that can be used to separate this sex from the other species in the genus. Another distinctive feature to be found in both sexes is the very strong concave loop of the t. p. line in cell Cu<sub>2</sub>. The females are more difficult to determine, as they have a dark-margined secondary and very much resemble dark specimens of *eupetheciaria*. The nature of the t. p. line and the broadly sloping tubercle of the front can be used to separate the *utahensis* females.

The male genitalia show a relationship to those of the preceding species in the nature of the sacculus arm, as it is a simple, curved, tubular structure. In *utahensis* it is much shorter, and has a longer and thicker terminal process, than in either *erroraria* or *biartata*. The female genitalia also show similarities to those of the two preceding species. In *utahensis*, the lamella postvaginalis tends to be somewhat diamond-shaped, the ventral band is narrow, well-defined, and curved, and the membranous sacs arise from prominent sclerotized bases.

### *Glaucina cilla*, new species

Plate 23, figure 9; text figures 5, 41

**MALE:** Head, vertex and front grayish brown, the scales with grayish white tips; front with upper portion rounded, or slightly peaked, the lower margin truncate, with a prominent, narrow, outer rim, a well-defined groove basad thereof, more depressed along lower margin than along lateral margins, and with a prominent central tubercle with a more or less broadly flattened apex, extending forward beyond lateral margins of front a distance slightly less than that between anterior edge of eye and lateral margin of front, similar in shape to outline of front, and occupying slightly more than one-third of length and one-half of width of front; palpi reaching front or slightly beyond, grayish brown; antennae with about 30 segments. Thorax grayish brown above, the scales with grayish white tips, paler below; legs grayish white, heavily scaled with brown, with the tibiae dark-scaled except for ends of segments; fore tibia with process arising basad of middle of segment, with terminal spine-like projection slightly less than twice as long as width of tibia; hind tibia with single, terminal pair of spines only. Abdomen with a mixture of light gray, grayish brown, and dark gray scales above and below.

**UPPER SURFACE OF WINGS:** Forewings with ground color light gray, more or less heavily overlain with dark brown and grayish brown scales, producing a unicolorous dark grayish brown, with obsolescent maculation; t. a. line absent; discal dot weakly indicated or absent; t. p. line faintly indicated or absent, when visible, subparalleling outer margin, represented by slightly darker scaling on the veins, concave between; subterminal area slightly darkened, subterminal line absent; terminal line brown, fading out at apex of forewing; fringe concolorous with wing. Hind wings pale grayish brown, the anal margin with darker scales; usually without maculation, but extradiscal line in some specimens very faintly indicated; terminal line and fringe as on primaries.

**UNDER SURFACE OF WINGS:** Forewings gray, with scattered grayish brown scales, and with dark brown scaling on costa; hind

wings grayish white, with scattered brown scales; all wings without maculation except for diffuse discal dot present on forewings in some specimens; terminal line weakly represented or absent; fringe concolorous with wings.

LENGTH OF FOREWING: 9 to 10 mm.; holotype, 10 mm.

FEMALE: Unknown.

MALE GENITALIA: Similar to those of *utahensis*; costa with small concave area near center, strongly angled at two-thirds of distance from base; sacculus arm arising in center of valve from distal extension of sclerotized base, short, tubular, of even width, straight except for curving distal end, with terminal spine-like process curving to form about a 90-degree angle with arm, the process single or double, elongate, slightly shorter than length of sacculus arm, widening after leaving arm, tapering to recurved apex; base of sacculus arm extending farther posteriad on outer side than on inner side, with small sclerotized projection from outer side of base, the area between it and base of valve lightly sclerotized, and continuing posteriorly as weakly sclerotized piece as far as origin of spine-like process; base of valves with narrow band, slightly angled medially; juxta diamond-shaped, with anterior sides slightly longer than posterior, with a small dorsal ridge; vesica with small cornutus, in length about one-third of length of aedeagus, tapering, with bifurcated base.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPES: Holotype, male, Vidal, San Bernardino County, California, February 20, 1948 (R. Coleman). Paratypes, two males, same data. All type material is in the collection of the American Museum of Natural History.

RANGE: This species is known only from the type locality, in February.

REMARKS: Three specimens and two genitalic preparations were studied. In general appearance and size, *cilla* might be mistaken for a small *macdunnoughi* or *baea*. However, the male genitalia show a closer relationship with those of the *erroraria* group, in that the cucullus arm is elongate and simple. The present species can be distinguished from all others in this group by its having but one

pair of spurs on the hind tibia of the male.

There is a rather close relationship between the male genitalia of *cilla* and those of *utahensis*. The present species has a straighter sacculus arm, curving only near the apex and with the terminal process curved to form an approximately right angle with the base of the arm; in *utahensis* the arm itself is curved medially, and the process continues straight from the arm. The cornutus in *cilla* is shorter than that of *utahensis*, as it is only about one-third of the length of the aedeagus as compared with one-half or more of the length in *utahensis*.

*Glaucina macdunnoughi* (Grossbeck)

Plate 23, figures 10–13; text figures 6, 7, 21, 42, 77

*Coenocharis macdunnoughi* GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 395.

*Glaucina macdunnoughi*, BARNES AND McDUNNOUGH, 1916, Contributions to the natural history of the Lepidoptera of North America, vol. 3, p. 184.

*Glaucina albidaria* CASSINO AND SWETT, 1922, Lepidopterist, vol. 3, p. 189. New synonymy.

MALE: Head, vertex and front with a mixture of grayish brown, dark gray, and white scales, the darker scales tending to be concentrated on lower margin and central area of front, the dark scales with white or whitish gray tips; front slightly tapering to wide base, somewhat attenuated dorsally, terminating in a prominent ridge on vertex, with a high, narrow, outer rim, narrowly interrupted at ridge on vertex and often slightly swollen laterally thereto, with a groove basad of rim, more depressed along lower margin than along lateral margins, and with a large, more or less evenly rounded, central tubercle, extending forward beyond lateral rim by a distance less than that between rim and anterior margin of eye, similar in shape to outline of front, and occupying between one-half and two-thirds of length and two-thirds of width of front; palpi extending slightly beyond frontal tubercle, grayish brown or brown, the scales white-tipped, and with apex of terminal segment tending to be white; antennae of 36 to 42 segments, with terminal one-fifth tending to be non-pectinate. Thorax with a mixture of white, gray, and grayish brown scales above, paler below; legs grayish white,

with variable amounts of brown scaling, the tibiae usually dark-scaled except for ends of segments; fore tibia with process arising basad of middle of segment, with terminal spine-like projection slightly longer than width of tibia. Abdomen with a mixture of gray, brown, and grayish black scales above and below, in some specimens with a double dorsal line and a single ventral line indicated by darker scales.

**UPPER SURFACE OF WINGS:** Forewings, ground color light gray, variably overlain with grayish brown and brownish black scales, with maculation very variable; t. a. line and discal dot absent; t. p. line more or less complete, paralleling outer margin, usually more strongly represented on veins and in fold and extending distally thereon, concave in cells, often with radial, cubital, and anal veins darkened towards base, in some specimens with small loop formed along center of inner margin over anal vein, the t. p. line usually shaded distally by a narrow, paler area; subterminal and terminal areas usually slightly darker than basal portion of wing; s. t. line absent; terminal line narrow, black or brownish black; fringe narrowly pale at base, otherwise concolorous with wing. Hind wings pale grayish white, the anal margin darker and with blackish brown scaling; maculation absent except for incomplete extradiscal line; terminal line and fringes as on forewings.

**UNDER SURFACE OF WINGS:** Forewings gray, with scattered pale grayish brown scales, the costa and veins with darker brown scaling; hind wings whitish gray, with evenly scattered brown scales; all wings without maculation; terminal line as above; fringes as above, except for wider, basal pale area.

**LENGTH OF FOREWING:** 11 to 15 mm.

**FEMALE:** Front tending to be slightly broader, and with tubercle slightly smaller, than in male; fore tibia with process arising slightly beyond center of segment, and with terminal spine-like process one and one-half to two times as long as width of tibia.

**UPPER SURFACE OF WINGS:** Forewings as in male, or slightly darker, with the subterminal and terminal areas tending to be slightly more heavily suffused with gray or grayish brown scales; maculation slightly

better defined. Hind wings tending to become lightly suffused with grayish brown scales in outer portion of wing.

**UNDER SURFACE OF WINGS:** Similar to that of wings of male.

**LENGTH OF FOREWING:** 11 to 15 mm.

**MALE GENITALIA:** Similar to those of *utahensis*; valves with costa extending beyond distal membranous portion of valve; costa swollen at base, concave medially, angled at two-thirds of distance from base; sacculus arm tubular, straight or slightly curved, sometimes wider in basal half, tapering and curved at apex, with small, outwardly projecting shoulder at middle on outer side, with several setae on ventral surface, terminal spine-like process thick, straight, tapering to point, in length about three-fifths of length of arm; several sclerotized striations extending from base of valve, subparalleling arm, to beyond shoulder; base of valve with narrow, sclerotized band, slightly angled medially; juxta with posterior margin rounded or pointed; vesica with evenly tapering cornutus, in length slightly more than one-half of length of aedeagus, with bifurcated base.

**FEMALE GENITALIA:** Similar to those of *erroraria*; sterigma with lamella postvaginalis round or elliptical, bordered laterally and anterolaterally by several sclerotized folds, and anteriorly by a well-defined, slightly curving, sclerotized band with a posterior, ventrally projecting ridge; ductus bursae with small, collar-like structure about two-fifths of width of lamella postvaginalis, the ductus usually well sclerotized; corpus bursae membranous, rounded, with transverse, elongate, weakly spinose signum. Membranous invaginations of intersegmental membrane arising from ovate, weakly sclerotized base, with or without a sclerotized, tapering central sac within the more elongate, membranous sac, the length of sclerotized sac equal to width of ductus bursae.

**EARLY STAGES:** Unknown.

**FOOD PLANT:** Unknown.

**TYPES:** The holotype female of *macdunnoughi* is in the collection of the United States National Museum.

The holotype of *albidaria* bears type number 16844 of the Museum of Comparative

Zoölogy at Harvard College; this is also a female. There is a specimen in the United States National Museum collection that also bears a holotype label, but this is spurious; at best it is but a paratype.

**TYPE LOCALITIES:** Christmas, Gila County, Arizona (*macdunnoughi*). The holotype of *albidaria* is labeled Mohave County, Arizona, while the original description states the type locality to be the Mohave Desert, Arizona; it is assumed that the former is the correct locality.

**RANGE:** Southern and western Arizona, southern and eastern California, southern Nevada, and extending up the Colorado River into southern Utah. (See fig. 21.) This species has been captured in every month of the year.

**REMARKS:** Two hundred and fifty-one specimens and 33 genitalic dissections were studied. This species is one that can be characterized by the variability of its maculation; in fact, it is difficult to find two specimens with identical markings. The t. a. line is nearly always missing, and the t. p. line is extremely variable in its representation. Often vein  $Cu_1$  is shaded with dark scales at the lower portion of the cell, and this is a diagnostic character, when present. The tubercle of the front of *macdunnoughi* is lower and more rounded than in the preceding species. However, there is variability in the structure of the front, too, as the type female has the outer rim raised to a point on the vertex, an apparently individual variation that has not been noted in other specimens.

The male genitalia show a progressive shortening and thickening of the sacculus arm and process from those of the two preceding species. There is also a small median shoulder developed, perhaps being derived from the asymmetrical base of the arm as found in *cilla*. There is some apparent variation in the width and shape of the sacculus arm, but this may be due to the degree of flattening that occurred when the genitalia were mounted. From both *utahensis* and *cilla*, the present species can be distinguished by the much straighter nature of the sacculus arm and process. The female genitalia can be distinguished by the round or elliptical lamella postvaginalis, by the vertically project-

ing ridge of the ventral band, by the tendency to have a simpler and less spinose signum, and by the nature of the membranous sacs.

#### *Glaucina epiphysaria* Dyar

Plate 23, figures 14-17; text figures 8, 9, 21, 43, 78

*Glaucina epiphysaria* DYAR, 1908, Proc. Ent. Soc. Washington, vol. 10, p. 55. GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 389, fig. 5 (male genitalia).

*Glaucina golgolata*, J. A. COMSTOCK (*nec* Strecker), 1955, Bull. Southern California Acad. Sci., vol. 54, p. 66.

**MALE:** Head, vertex and front with a mixture of grayish white and dark gray, or gray-brown, scales, the darker scales tending to have the apex narrowly white, the front often slightly darker than vertex; front with apex bluntly pointed, being widest above middle, slightly constricted above truncate base, with a prominent, narrow, outer rim, shallowly V-shaped at vertex, with a groove basad of ridge, more depressed along lower margin than along lateral margins, and with the central area broadly swollen, rounded, and occupying most of the area of the front, extending forward beyond lateral rim by a distance equal to that between rim and anterior margin of eye; palpi extending slightly beyond tubercle, dark gray or brown, with the scales white-tipped; antennae with 39 to 42 segments, with terminal five segments tending to be non-pectinate. Thorax dark gray or grayish brown above, grayish white below; legs grayish brown, with variable amounts of dark brown scaling; fore tibia with process arising at or near middle of segment, with terminal spine-like projection small, its length not exceeding the width of tibia. Abdomen grayish brown above and below, often with a double dorsal line and a single ventral line indicated by darker scales.

**UPPER SURFACE OF WINGS:** Forewings with ground color varying from light to dark gray, or grayish brown, unicolorous, more or less heavily overlain with dark brown and brown-black scales, the maculation varying from distinct to obsolescent, with t. p. and subterminal lines usually present; t. a. line absent except for an outwardly oblique section running from about one-fifth of distance from base on inner margin across anal vein, curving distad just above this and joining

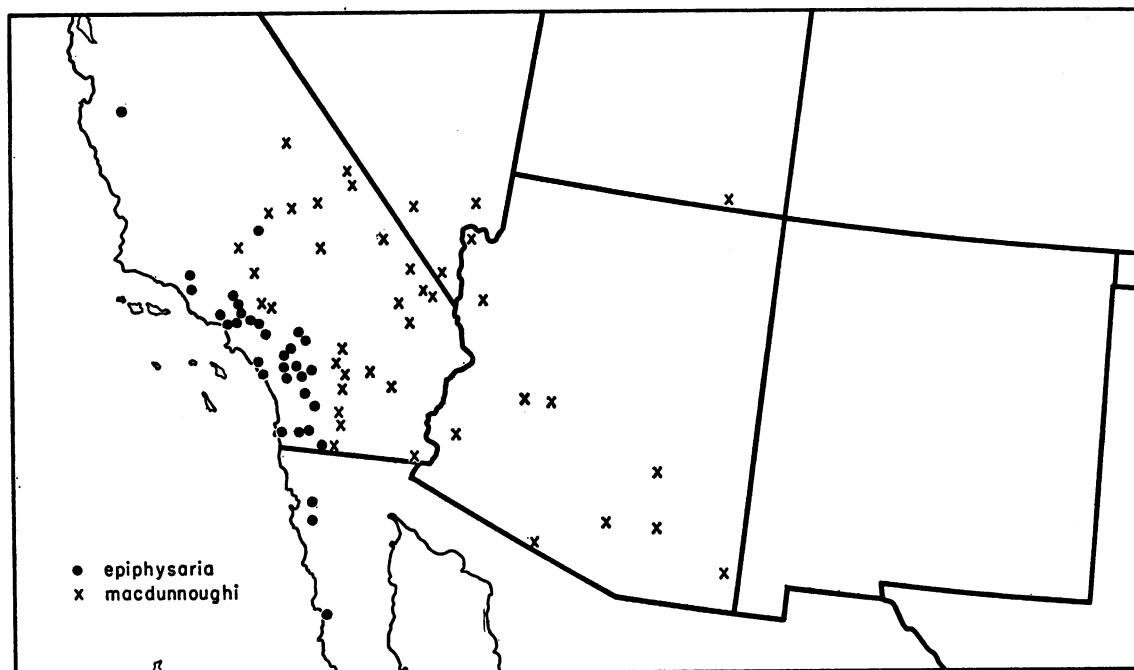


FIG. 21. Distribution of *Glaucina macdunnoughi* (Grossbeck) and *epiphysaria* Dyar.

t. p. line on anal vein, thence to inner margin; discal dot absent; t. p. line black, usually distinct, arising just beyond three-fourths of distance from base, subparalleling outer margin, slightly produced at end of cell, strongly concave between veins, in some specimens more strongly represented on veins, tending to become broken or obsolete below cell, in some extended basally along bottom of cell and represented by an elongate dash in center of cell  $Cu_2$ ; subterminal area tending to become slightly darker next to s. t. line, the latter usually complete, prominent, white, sharply zig-zag; terminal line dark, complete, with small, intravenular dots; fringe concolorous with wing. Hind wings white, lightly suffused with pale brown scales distally, the anal margin with numerous dark brown or brown-black scales; maculation varying from absent to having a complete post-median line, concave in cells, sometimes just indicated on veins, and with a second line indicated along anal margin between the post-median and anal angle; terminal line as on forewings; fringe white, becoming darker near anal angle.

UNDER SURFACE OF WINGS: Forewings

unicolorous dull grayish brown; hind wings white, suffused with numerous dark brown and gray-brown scales; both wings without maculation, the veins sometimes slightly darkened; terminal line and fringe as above.

LENGTH OF FOREWING: 10 to 16 mm.

FEMALE: Front broader than in male, with tubercle slightly larger and more rounded; fore tibia with process arising distad of center, and with terminal spine-like projection not exceeding width of tibia.

UPPER SURFACE OF WINGS: Forewings with ground color averaging slightly lighter and grayer than in males, with the maculation slightly less distinct, the t. p. line tending to become more broken and the s. t. line to be weaker. Hind wings light gray, heavily suffused distally with dark gray or gray-brown.

UNDER SURFACE OF WINGS: Primaries as in male, secondaries light gray basally, becoming concolorous with primaries distally.

LENGTH OF FOREWING: 11 to 17 mm.

MALE GENITALIA: Similar to those of *macdunnoughi*; costa with moderate median concavity and distal swelling; sacculus arm with widened basal portion, forming a median, ventral shoulder, distal part of arm thin,



curving ventrally, terminal spine-like process of same width as arm, gradually tapering to blunt point, continued straight from arm, in length one and one-half times as long as distal portion of arm; several sclerotized striations extending from base of valve, paralleling arm to shortly beyond shoulder, twisted and curving medially under distal portion of arm; base of valve with narrow, sclerotized band, slightly curved medially, swollen anteriorly; juxta with anterior portion slightly larger than posterior, the latter with slightly convex sides, with or without terminal dorsal ridge; aedeagus slender; vesica with evenly tapering cornutus, in some specimens broadened basally, then tapering, in length about one-half of length of aedeagus, with bifurcated base.

**FEMALE GENITALIA:** Similar to those of *macdunnoughi*; sterigma with lamella post-vaginalis elliptical, bordered laterally and anterolaterally by several sclerotized folds, and anteriorly by a broadly U-shaped sclerotized band with an elongate, posterior, ventrally projecting ridge, widened medially; ductus bursae with small, collar-like structure about one-third of width of lamella post-vaginalis; corpus bursae membranous, rounded, with transverse, elongate to small, strongly or weakly spinose signum. Membranous invaginations of intersegmental membrane arising from ovate, sclerotized, funnel-shaped base, with a ventral, median ridge at opening, extending as a sclerotized, tapering, central sac within the more elongate, membranous sac, length of sclerotized sac shorter than width of ductus bursae.

**EARLY STAGES:** The mature larva has been described by Comstock.

**FOOD PLANT:** *Eriogonum fasciculatum* Benth.

**TYPES:** Described from one male and two female specimens; these are in the collection of the United States National Museum, with the male bearing type label and number 11698, the genitalia being on slide 69, October 9, 1931, F. H. Benjamin. This male is hereby designated as the lectotype.

**TYPE LOCALITY:** San Diego, San Diego County, California.

**RANGE:** The coastal areas of southern California, extending south into Baja California and north as far as San Benito County.

(See fig. 21.) On the wing in every month of the year.

**REMARKS:** Seven hundred and eighty-three specimens and 34 genitalic preparations were examined, including the types. This species is fairly constant in its color, although old specimens tend to lose their maculation and to become a rather unicolorous brownish gray. One of the characteristic features is variability of the maculation, with the tendency for the t. p. line to be broken below the cell and to have a loop formed along the inner margin by the union of the t. a. and t. p. lines. Another is the zig-zag, white s. t. line, although this tends to become obscure in old specimens. The variability of the markings, especially of the t. p. line, is similar to that found in *macdunnoughi*, but it is not so extreme. Both species have a tendency for the darkening of vein  $Cu_1$  in the lower portion of the cell, but more of the cross lines are usually present in *epiphysaria*. The darker color of the forewings, the shorter spine-like process of the tibia, and the more completely pectinate antennae will serve to separate the present species from *macdunnoughi*. There is also a difference in the distribution of the two species; *epiphysaria* flies in the coastal areas of southern California and Baja California, while *macdunnoughi* is a native of the semi-arid regions east of this area.

The male genitalia of *epiphysaria* are characterized by the development of the widened basal section of the sacculus arm, terminating in a broad shoulder, the arm continuing distally as a much-narrowed tubular structure. The female genitalia can be separated from those of the closely allied *macdunnoughi* by the fact that they have a longer and stronger ventrally projecting ridge of the ventral band, by the larger, more heavily sclerotized bases of the membranous invaginations, with the ventral median ridge continued as a sclerotized inner sac, the latter being shorter than the width of the ductus bursae.

***Glaucina baea*, new species**

Plate 23, figure 18; plate 24, figure 1;  
text figures 10-12, 22, 44, 79

*Tornos eupetheciaria* GROTE, 1883, Canadian Ent., vol. 15, p. 24 (*partim*). RINDGE, 1955, Bull. Amer. Mus. Nat. Hist., vol. 106, p. 142.

*Tornos eupethesiaria* (*sic!*), CASSINO AND SWETT, 1924, *Lepidopterist*, vol. 4, p. 32.

*Glaucina eupetheciaria*, GROSSBECK, 1912, *Bull. Amer. Mus. Nat. Hist.*, vol. 31, p. 385 (*partim*, not fig. 2). W. S. WRIGHT, 1920, *Bull. Amer. Mus. Nat. Hist.*, vol. 42, p. 487 (*partim*). CASSINO AND SWETT, 1924, *Lepidopterist*, vol. 4, p. 31 (fig. male genitalia).

**MALE:** Head, vertex and front with a mixture of grayish brown, grayish black, and white scales, the last tending to be concentrated on ventral portion of front and posterior part of head, the dark scales with white or whitish gray tips; front relatively low and broad, ratio of height to width about 6/5, somewhat attenuated dorsally, with a narrow outer rim, narrowly interrupted at vertex, with a groove basad of rim, more depressed along lower margin than along lateral margins, and with a large, more or less evenly rounded, central tubercle, extending forward beyond lateral rim by a distance slightly greater than that between rim and anterior margin of eye, similar in shape to outline of front, and occupying between one-half and two-thirds of length and almost two-thirds of width of front; palpi extending only as far as tubercle, grayish brown, the scales white-tipped, and in some specimens with apex of terminal segment tending to be white; antennae of 32 to 36 segments, with terminal one-sixth tending to be non-pectinate. Thorax with a mixture of white, gray, and grayish brown scales above, whitish below; legs white or grayish white, with variable amounts of brown scaling, the tibiae usually dark-scaled except for ends of segments; fore tibia with process arising at, or just basad of, middle of segment, with terminal spine-like projection from one and one-half times to twice as long as width of tibia. Abdomen with a mixture of white, gray, grayish brown, and grayish black scales above and below, in some specimens with a double dorsal line and ventral lines indicated by darker scales.

**UPPER SURFACE OF WINGS:** Forewings, ground color light gray or whitish gray, more or less overlain with grayish brown and grayish black scales, producing a very finely speckled appearance, with weak maculation; t. a. line absent, or weakly indicated by a few dark scales in lower part of wing; discal

dot absent or weakly present; t. p. line weakly represented, in some individuals absent, indicated by pale distal band, where present arising about four-fifths of distance from base, proceeding straight across wing, paralleling outer margin to anal vein, then angled basad, in some represented only by dark scales on veins; subterminal and terminal areas of wing concolorous with base, or lightly suffused with dark scaling; s. t. line absent; terminal line narrow, black or brownish black; fringe concolorous with wing. Hind wings white, overlain with pale grayish brown scales, the anal margin darker and with blackish brown scaling; maculation absent except for an incomplete extradiscal line; terminal line and fringe as on forewings.

**UNDER SURFACE OF WINGS:** Forewings pale gray, with scattered brown scales along costa, and with veins slightly darkened; hind wings shiny, whitish gray, with a relatively few, evenly scattered, brown scales; all wings without maculation; terminal line and fringes as above.

**LENGTH OF FOREWING:** 7 to 12 mm.; holotype, 11 mm.

**FEMALE:** Front tending to be slightly broader, almost as wide as high, and with tubercle slightly smaller, than in male; fore tibia as in male.

**UPPER SURFACE OF WINGS:** Forewings similar to those of male, with maculation in some specimens slightly better defined. Hind wings as in male, or slightly more suffused with grayish brown scales in outer portion of wing.

**UNDER SURFACE OF WINGS:** Similar to that of wings of male.

**LENGTH OF FOREWING:** 8 to 12 mm.; allotype, 12 mm.

**MALE GENITALIA:** Similar to those of *epi-physaria*; costa with median concavity tending to be flat, about one-fifth of length of costa, with strongly swollen, rounded, distal swelling basad of three-fourths of distance from base; sacculus arm with basal two-thirds enlarged, narrowed to thinner distal portion, extending posteriorly, terminal spine-like process narrowing and continuing at an angle from junction with arm, tapering to a fine point, in length about twice as long as distal portion of arm; several sclerotized striations

extending from base of valve, paralleling arm to shortly beyond enlarged portion, curving medially under distal portion of arm; basal sclerotized band, juxta, and aedeagus as in *epiphysaria*; cornutus slightly broader and with slightly deeper bifurcated base.

**FEMALE GENITALIA:** Similar to those of *epiphysaria*; sterigma with lamella postvaginalis elliptical, bordered anterolaterally by several sclerotized folds, and anteriorly by a slightly curved sclerotized band with a posterior, vertically projecting ridge slightly elevated above band and not much wider than lamella postvaginalis; ductus bursae with small, collar-like structure about one-half of width of lamella postvaginalis; corpus bursae membranous, rounded, with transverse, elongate to small, strongly or weakly spinose signum. Membranous invaginations of intersegmental membrane arising from elongate, weakly sclerotized base, membranous sac broad, shorter than width of ductus bursae, the sides convoluted.

**TYPES:** Holotype, male, and allotype, female, Borrego, San Diego County, California, March 5, 1940 (G. H. and J. L. Sperry). Paratypes, 534 specimens, from the following states and counties: Imperial, Inyo, Kern, Los Angeles, Mono, Riverside, San Bernardino, and San Diego counties, California; Clark County, Nevada; Maricopa, Mohave, Pima, Pinal, Santa Cruz, Yavapai, and Yuma counties, Arizona; Luna County, New Mexico. Included in the above is the female type of *eupetheciaria* Grote. Holotype and allotype in the collection of the American Museum of Natural History; paratypes in the collections of that institution, of the British Museum (Natural History), of the United States National Museum, of the Los Angeles County Museum, of the Museum of Comparative Zoölogy at Harvard College, of the Chicago Natural History Museum, of the Department of Entomology, Cornell University, of the Department of Entomology and Parasitology, University of California, Berkeley, of C. P. Kimball, C. W. Kirkwood, R. Leuschner, and of the author.

**RANGE:** Southern and eastern California, southern Nevada, southern and western Arizona, and southwestern New Mexico. (See fig. 22.) This species has been captured in every month of the year.

**REMARKS:** Five hundred and thirty-nine specimens and 42 genitalic preparations were examined. This species is the smallest one in the genus. In addition to this character it may be recognized by the smaller number of segments in the antennae, the wide front, and by the pale ocher or grayish white forewings with obscure maculation. Some of the difference in wing coloration is seasonal, as individuals caught in the early spring tend to be grayish, while summer examples are paler.

The genitalia of this species are quite similar to those of *epiphysaria*, although smaller in size. The sacculus arms of both have a broadly swollen base, but in the present species the distal part is shorter than in *epiphysaria*, and the terminal spine-like process is longer in relation to the distal part, and it is at an angle to the arm instead of being straight, as in *epiphysaria*. In the female genitalia, the lamella postvaginalis of *baea* tends to be more elliptical, the ventrally projecting ridge of the ventral band is both shorter and lower, and the membranous sacs arise from smaller, more weakly sclerotized bases and lack the sclerotized inner sac of the preceding species.

#### *Glaucina escaria* (Grote)

Plate 24, figures 2, 3; text figures 13, 14, 23, 45, 80

*Tornos escaria* GROTE, 1882, Canadian Ent., vol. 14, p. 186.

*Lepiodes escaria*, HULST, 1887, Ent. Amer., vol. 3, p. 11.

*Glaucina escaria*, HULST, 1896, Trans. Amer. Ent. Soc., vol. 23, p. 352. GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 384. BARNES AND MCDUNNOUGH, 1916, Contributions to the natural history of the Lepidoptera of North America, vol. 3, p. 183; 1918, *op. cit.*, vol. 4, p. 151, pl. 22, figs. 12, 13.

*Glaucina puellaria* DYAR, 1907, Jour. New York Ent. Soc., vol. 15, p. 105. GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 386, fig. 3 (male genitalia) (*partim*). BARNES AND MCDUNNOUGH, 1918, Contributions to the natural history of the Lepidoptera of North America, vol. 4, p. 151 (synonymy).

*Glaucina* species unknown, W. S. WRIGHT, 1920, Bull. Amer. Mus. Nat. Hist., vol. 42, p. 488 (*partim*).

**MALE:** Head, vertex and front with a mixture of gray and blackish brown scales, the latter with white tips; front widest medially,

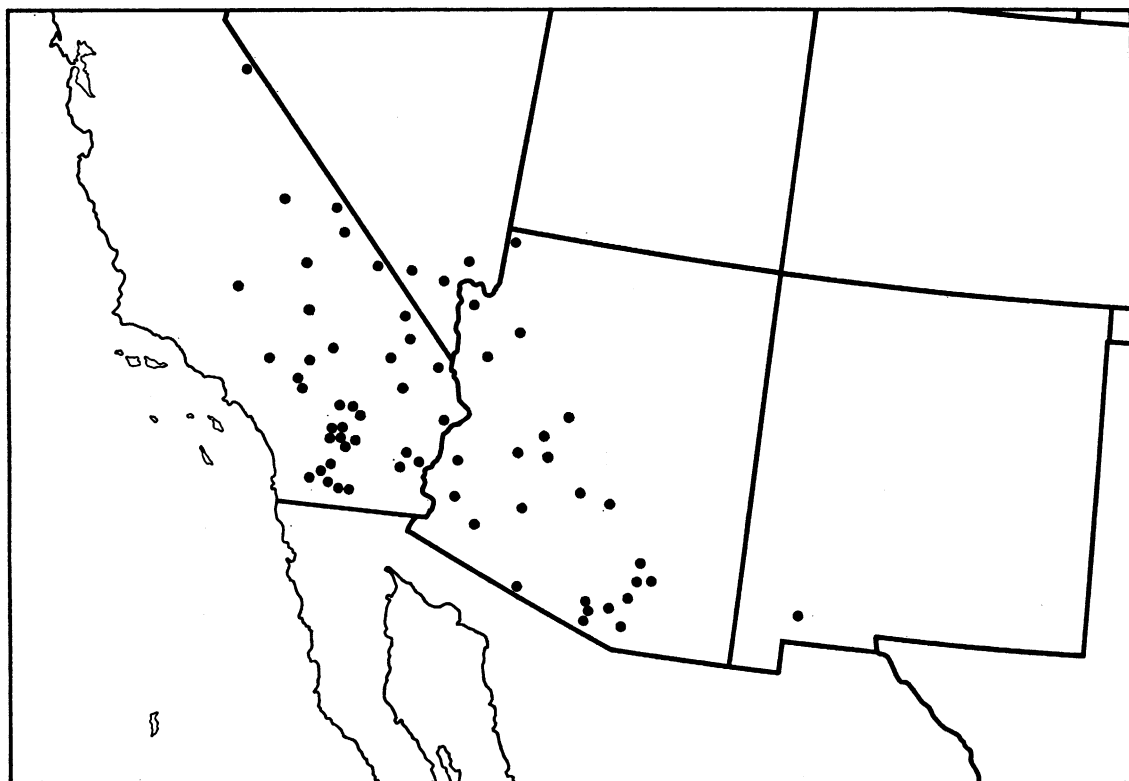


FIG. 22. Distribution of *Glaucina baea*, new species.

slightly narrowed ventrally, attenuated dorsally, with a prominent, narrow, outer rim, narrowly interrupted at vertex and slightly swollen laterally thereto, with a well-defined groove basad of rim, more depressed along lower margin than lateral margins, and with a large, high, truncated central tubercle, extending forward beyond lateral rim by a distance slightly greater than that between rim and anterior margin of eye, elliptical in outline, and occupying slightly less than one-half of length and about two-fifths of width of front; palpi extending to lateral rim, with mixed white and brownish black scales, the latter white-tipped; antennae of from 38 to 43 segments. Thorax grayish brown or grayish black above, the scales with narrow white tips, whitish below; legs whitish, with variable amounts of brown scaling, the tibiae usually dark-scaled except for ends of segments; fore tibia with process arising basad of middle of segment, with terminal spine-like process one and one-half to two times as long as width of tibia. Abdomen with grayish brown and

blackish gray scaling above and laterally with some whitish scaling ventrally.

UPPER SURFACE OF WINGS: Forewings, ground color gray, heavily and evenly overlain with grayish brown or grayish black scales, with t. a. line usually faint and t. p. line complete; t. a. line weakly represented or absent, in some specimens showing in lower part of wing; discal dot present, small; t. p. line usually complete, sometimes weakly represented, arising on costa about three-fourths of distance from base, paralleling outer margin, outwardly produced on veins, with moderate concave loop in cell  $Cu_2$ , the line in some individuals narrowly shaded distally with ground color; s. t. line very faintly indicated, shaded basally by a slightly dark band; terminal area concolorous with remainder of wing; terminal line narrow, black or blackish brown; fringe slightly paler than wing, darkened opposite veins. Hind wings whitish gray, overlain with pale grayish brown scales, the anal margin darker and with blackish brown scaling; maculation absent except for small

discal dot and incomplete extradiscal line; terminal line dark, complete; fringe white, darkened above anal angle, especially on veins.

**UNDER SURFACE OF WINGS:** Forewings pale gray, with scattered grayish brown scales along costa, and with veins slightly darkened; hind wings white, with a few scattered grayish brown scales; all wings with small discal dots, in some specimens with trace of t. p. line near costa of forewings, without other maculation; terminal line and fringes as above.

**LENGTH OF FOREWING:** 11 to 15 mm. A series of 16 specimens averages 13.0 mm.

**FEMALE:** Front and central tubercle tending to be slightly wider than in male; fore tibia with process arising just distad of middle of segment, and with spine-like projection at least twice as long as width of segment.

**UPPER SURFACE OF WINGS:** Forewings similar to those of male, in some specimens not quite so heavily suffused with dark scales, and with cross lines becoming more prominent. Hind wings with outer margin more or less broadly suffused with blackish brown or grayish black scales, producing a dark border.

**UNDER SURFACE OF WINGS:** Similar to that of wings of male, but forewings slightly paler, and with all wings having a broad, dark border.

**LENGTH OF FOREWING:** 11 to 15 mm. A series of 21 specimens averages 12.7 mm.

**MALE GENITALIA:** Similar to those of *epiphysaria*; costa with middle one-third concave, tending to be flat, bordered distally by moderate swelling; sacculus arm with basal one-half somewhat swollen, in form of an elongate oval anterodistally, posterior margin forming the shoulder-like projection, distal part of arm straight, slightly tapering, terminal spine-like process slender, tapering to a thin point, slightly S-shaped, curving after leaving arm, elongate, in length three-fourths of length of entire arm; several sclerotized striations extending from base of valve as far as shoulder-like process, the latter with a small, triangular, posterodistal lamina, continuing posteriorly as a more lightly sclerotized, sheath-like piece, parallel with distal portion of arm, terminally bent outward just beyond origin of spine-like process; sclerotized band at base of valves slightly curved

or angled medially; juxta more or less diamond-shaped, the posterior sides straight or concave, apically pointed or rounded, with small pitted area around apex, terminally with dorsal ridge; aedeagus as long as, or slightly shorter than, combined lengths of tegumen and saccus; vesica with cornutus one-half, or slightly more than one-half, as long as aedeagus, tapering from bifurcated base.

**FEMALE GENITALIA:** Similar to those of *epiphysaria*; sterigma with lamella postvaginalis round or ovate, bordered laterally by several sclerotized folds, and anteriorly by a slightly curved, well-defined, sclerotized band, in length not much wider than lamella postvaginalis; ductus bursae with small, collar-like structure slightly less than one-half of width of lamella postvaginalis; corpus bursae membranous, rounded, with elongate, transverse, spinose signum. Membranous invaginations of intersegmental membrane arising from elongate, sclerotized bases, in length longer than width of lamella postvaginalis, shallowly V-shaped in cross section, with sac arising distally, curving sharply medially, extending at right angles to ductus bursae, with sclerotized sac inside larger, membranous sac.

**EARLY STAGES:** Unknown.

**FOOD PLANT:** Unknown.

**TYPES:** Grote described *escaria* from both sexes, without saying if more than one specimen of each sex was at hand. There are at least three specimens bearing this type label; the one from the Hulst collection, and now in the American Museum of Natural History, is *erroraria*. The other two, a male and a female, are in the collection of the United States National Museum. The male was designated as the lectotype by Barnes and McDunnough (1916).

Dyar described *puellaria* from six females, all labeled as cotypes. The specimen in the collection of the United States National Museum, bearing their type number 10728, was designated as the lectotype by Barnes and McDunnough (1918); it has the genitalia mounted on slide J.F.G.C. No. 726, November 3, 1936, and is from "So. Arizona (Poling)." The Washington collection also has two specimens, each labeled "male type"; Dyar mentions these in the original descrip-



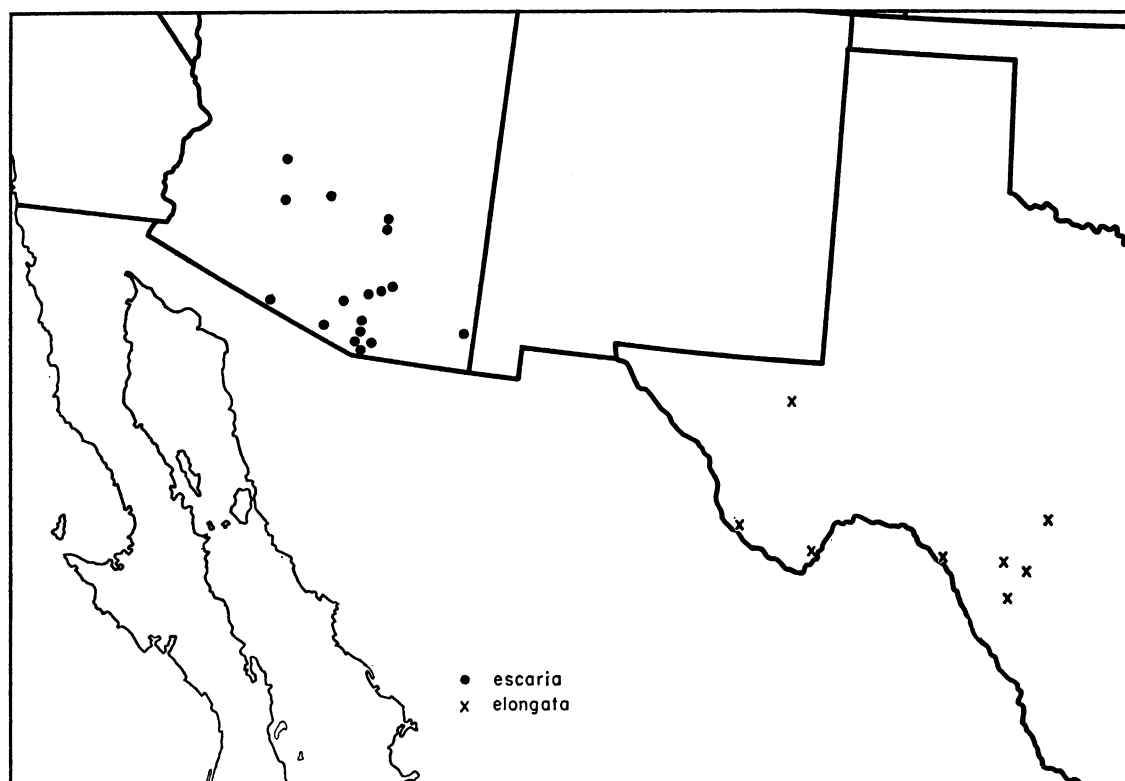


FIG. 23. Distribution of *Glaucina escaria* (Grote) and *elongata* (Hulst).

tion but says that they "have not been marked as types." Barnes and McDunnough (1918) noted that one of the cotypes represented *Synglochis perumbraria* Hulst, and this specimen was illustrated by them.

TYPE LOCALITIES: Arizona (*escaria*); "So. Arizona" (*puellaria*).

RANGE: Southern Arizona, apparently being primarily a species of the Arizona upland, or Sahuaro Desert. (See fig. 23.) On the wing from March through October.

REMARKS: One hundred and sixty-two specimens and 79 genitalic preparations were studied. *Glaucina escaria* is the first in a series of very closely allied populations, the differentiation of which is one of the most difficult problems in the taxonomy of this genus. They all have very similar fronts, pattern, and genitalia; life history studies are badly needed here to assist in the evaluation of these populations. The present species is large, dark gray, grayish black, or blackish brown, with two, often faint, parallel or subparallel, cross lines on the primaries. Its large size, dark

coloring, and strongly tubercled front are diagnostic characters that separate this species.

The male genitalia of this complex are distinguished by the swollen base of the cucullus arm, by having a median, distal shoulder, by the elongate terminal spine-like process, and by the sclerotized, sheath-like piece that extends from the shoulder to the base of the spine-like process. The female genitalia of *escaria* are best differentiated from those of all the preceding species by the shape of the membranous invaginations, which arise from very long bases and extend transversely, at right angles to the ductus bursae.

***Glaucina eupetheciaria eupetheciaria* (Grote)**

Plate 24, figures 4, 5; text figures 15-18, 24, 46, 81  
*Tornos eupetheciaria* GROTE, 1883, Canadian Ent., vol. 15, p. 24.

*Lepiodes eupitheciaria* (sic!), HULST, 1887, Ent. Amer., vol. 3, p. 11. J. B. SMITH, 1888, List of the Lepidoptera of boreal America, p. 71.

*Coenocharis eupitheciaria* (sic!), HULST, 1896,

Trans. Amer. Ent. Soc., vol. 23, p. 353. DYAR, "1902" [1903], Bull. U. S. Natl. Mus., no. 52, p. 323. J. B. SMITH, 1903, Check list of the Lepidoptera of boreal America, p. 76.

*Glaucina eupetheciaria*, GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 385, fig. 2 (male genitalia) (*partim*). W. S. WRIGHT, 1920, Bull. Amer. Mus. Nat. Hist., vol. 42, p. 487 (*partim*).

*Tornos pygmeolaria* GROTE, 1883, Canadian Ent., vol. 15, p. 24.

*Lepiodes pygmeolaria*, HULST, 1887, Ent. Amer., vol. 3, p. 11.

*Glaucina pygmeolaria*, HULST, 1896, Trans. Amer. Ent. Soc., vol. 23, p. 352. GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 385 (synonym of *eupetheciaria*).

*Coenocharis elongata* HULST, 1896, Trans. Amer. Ent. Soc., vol. 23, p. 353 (*partim*). DYAR, 1907, Jour. New York Ent. Soc., vol. 51, p. 106. GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 387. RINDGE, 1955, Bull. Amer. Mus. Nat. Hist., vol. 106, p. 142.

*Glaucina escaria*, W. S. WRIGHT (*nec* Grote), 1920, Bull. Amer. Mus. Nat. Hist., vol. 42, p. 487.

*Glaucina erroraria*, W. S. WRIGHT (*nec* Dyar), 1920, Bull. Amer. Mus. Nat. Hist., vol. 42, p. 487 (*partim*).

*Glaucina* species unknown, W. S. WRIGHT, 1920, Bull. Amer. Mus. Nat. Hist., vol. 42, p. 488 (*partim*).

*Coenocharis tuconensis* (*sic!*) CASSINO AND SWETT, 1924, Lepidopterist, vol. 4, p. 32 (illustration of male genitalia), p. 31. New synonymy.

*Glaucina tuconensis* (*sic!*), McDUNNOUGH, 1945, Canadian Ent., vol. 77, p. 66.

**MALE:** Head, vertex and front with a mixture of white, grayish white, and grayish brown scales, the darker scales with white tips; front similar in shape to that of *escaria*, central tubercle smaller, occupying from one-third to two-fifths of length and from one-fourth to two-fifths of width of front; palpi extending to lateral rim, with mixed white and grayish brown scales, the latter white-tipped; antennae of 37 to 40 segments. Thorax with mixed gray and grayish brown scales above, the scales narrowly gray-tipped, whitish below; legs whitish, with variable amounts of brown scaling, the tibiae usually dark-scaled except for ends of segments; fore tibia as in *escaria*. Abdomen with white, grayish brown, and grayish black scaling above and below.

**UPPER SURFACE OF WINGS:** Forewings

similar to those of *escaria*; ground color grayish white, evenly overlain with grayish brown or grayish black scales, with cross lines usually visible; t. a. line as in *escaria*; discal dot usually present, sometimes in form of elongate dash at right angles to costa; t. p. line as in *escaria*, slightly better defined, less sharply extended distally on veins; s. t. line usually not differentiated; terminal area, terminal line, and fringe as in *escaria*. Hind wings as in *escaria*.

**UNDER SURFACE OF WINGS:** Similar to under surface of those of *escaria*.

**LENGTH OF FOREWING:** 9 to 12 mm. A series of 46 specimens averages 10.3 mm.

**FEMALE:** Front with tubercle varying from that in male or reduced to a small mound, less than one-fifth of length of front; fore tibia as in *escaria*.

**UPPER SURFACE OF WINGS:** Forewings similar to those of male, in some specimens less heavily suffused with dark scales, and with cross lines more prominent; s. t. line in some specimens faintly indicated, shaded basally by a slightly darker band. Hind wings with outer margin broadly suffused with blackish brown or grayish black scales, producing a dark border.

**UNDER SURFACE OF WINGS:** Similar to that of wings of male, but forewings slightly paler, and with all wings having a broad, dark border.

**LENGTH OF FOREWING:** 9 to 12 mm. A series of 62 specimens averages 10.8 mm.

**MALE GENITALIA:** Very similar to those of *escaria*, but slightly smaller; costa with central concave area and distal swelling tending to be less strongly developed than in *escaria*; sacculus arm with basal, swollen part slightly shorter than, or the same length as, distal part, the latter tapering, slightly curving outward at junction with terminal spine-like process, the latter tapering, curving at base, then straight; several sclerotized striations extending from base of valve to shoulder, continuing distally and anteriorly as slightly S-shaped, sheath-like piece, joined by lamina from shoulder, extending to about one-third of length of terminal spine-like process; juxta, aedeagus, and vesica as in *escaria*.

**FEMALE GENITALIA:** Similar to those of *escaria*; sterigma with lamella postvaginalis round or somewhat diamond-shaped, bor-

dered anterolaterally by several sclerotized folds, and anteriorly by a slightly curved, well-defined, sclerotized band, in length about one and one-half times as long as width of lamella postvaginalis; ductus bursae with small, collar-like structure, about one-half as wide as width of lamella postvaginalis; corpus bursae membranous, rounded, with elongate or elliptical, transverse, spinose signum. Membranous invaginations of intersegmental membrane arising from elongate, sclerotized bases, in length longer than width of lamella postvaginalis, funnel-shaped medially, continuing anteriorly as narrow, sclerotized tube inside of membranous sac, evenly and gently curving medially.

**TYPES:** In the original description of *eupetheciaria*, Grote stated that he had both male and female. The type male is in the collection of the United States National Museum, and this specimen is hereby designated as the lectotype. The female labeled as a type of this species is not conspecific, being an example of *baea* Rindge; it is in the American Museum of Natural History collection.

Grote also had a male and female before him when describing *pygmeolaria*. Both of these specimens are in the United States National Museum, and the male is hereby designated as the lectotype.

The female, bearing a Hulst type label for *elongata*, in the collection of the United States National Museum is an example of this species.

The holotype, male, and allotype, female, of *tuconensis* (*sic*!) are in the Museum of Comparative Zoölogy at Harvard College.

**TYPE LOCALITIES:** Arizona (*eupetheciaria* and *pygmeolaria*). The holotype of *tuconensis* (*sic*!) bears the label Tucson, Arizona, although the original description states the locality to be Globe, Arizona. It is assumed that the label gives the correct type locality.

**RANGE:** Arizona, extending westward to extreme southeastern California and southern Nevada, and north into Utah, in the Colorado River Valley, and into northeastern Baja California. (See fig. 24.) On the wing from March through October.

**REMARKS:** Three hundred and ninety-four specimens and 75 genitalic preparations were examined. This species is very similar to *escaria* and has often been confused with it.

The present species may be separated by its smaller size (males, 10.3 mm., females, 10.8 mm. in average wing length, as compared with 13.0 and 12.7 mm. for the corresponding sexes of *escaria*), the lighter gray coloration of the forewings above, with a tendency towards an elongate discal dash, by the fewer antennal segments, and by the smaller frontal tubercle. The females of this species are very similar to those of *utahensis*, and very often a study of the genitalia is required for a separation of the two. The present species does not have so deep an indentation of the t. p. line in the fold as does *utahensis*, and the tubercle of the front is usually stronger.

The male genitalia are extremely close to those of *escaria*. The present species tends to have a less strongly sinuate costa, with the basal portion of the sacculus arm slightly shorter than the distal part, the latter tending to curve outward at the very end, and the terminal spine-like process curved near the base only, rather than being slightly S-shaped as in *escaria*. The distal sheath-like piece tends to be slightly longer than in *escaria*. The individual variation within these two species, plus the different degrees of flattening that occur in the mounting of the dissections on the slides, apparently allow for some overlap in these characters. In a series of genitalic preparations, however, the above appear to hold true.

The female genitalia are also very similar to the same structures of *escaria*, although smaller in size. In the present species the anterior sclerotized band ventrad to the collar of the ductus bursae tends to be slightly longer than the same structure in *escaria*. A more obvious difference is to be found in the shape of the membranous invaginations of the intersegmental membrane. In *escaria* these are sharply bent after leaving the sclerotized base, while in *eupetheciaria* they form a larger, more rounded curve.

***Glaucina eupetheciaria lucida*, new subspecies**

Plate 24, figures 6, 7; text figure 24

**MALE:** Head, vertex, front and palpi with a mixture of white and blackish brown scales, the latter with white tips. Thorax white, with variable amounts of blackish brown scaling above, white below. Abdomen white, with blackish brown and grayish brown scaling.

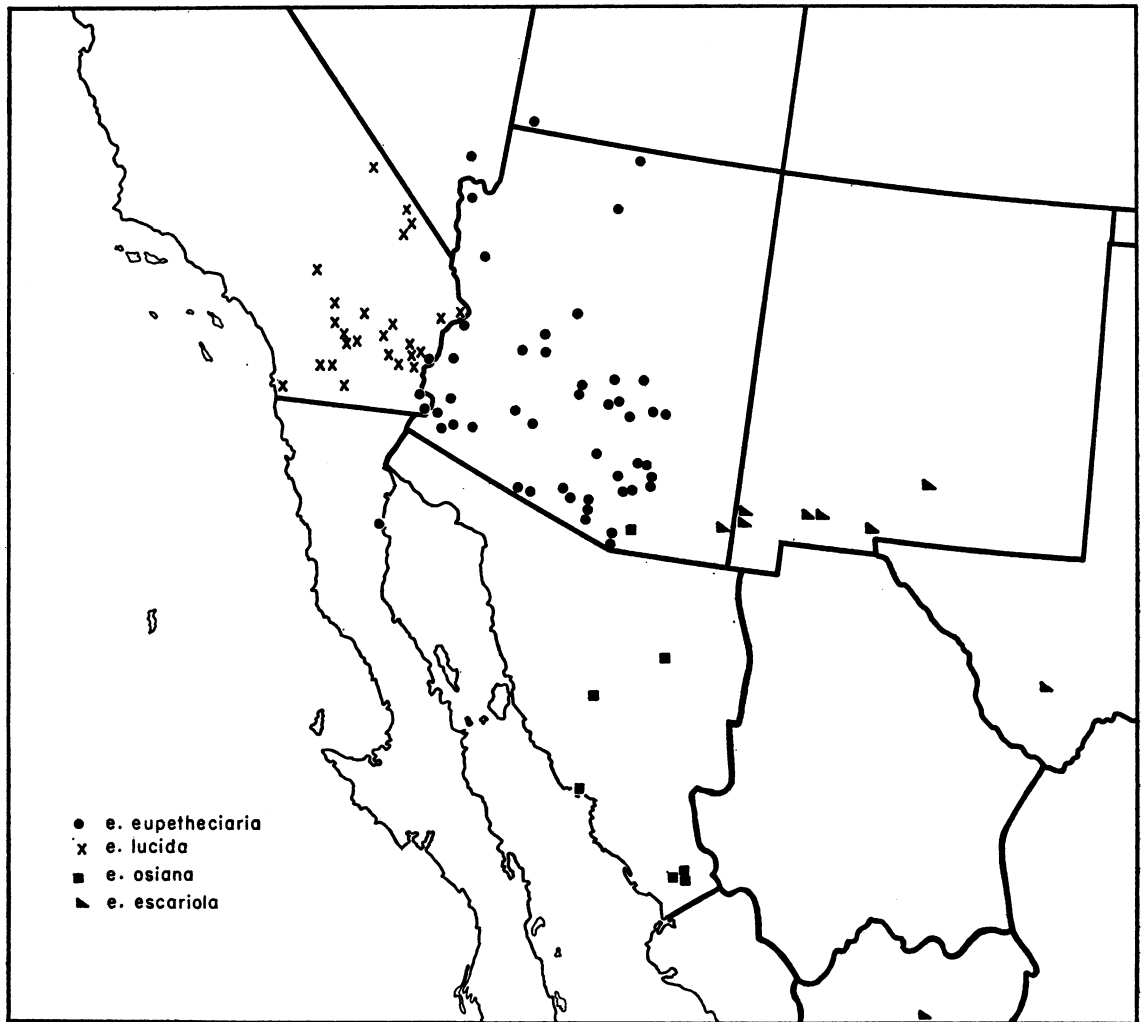


FIG. 24. Distribution of *Glaucina eupetheciaria* (Grote).

**UPPER SURFACE OF WINGS:** Forewings, ground color white, evenly overlain with black or blackish brown scales, producing a very finely speckled appearance; t. a. line usually distinct, often complete; discal dot small, often elongate; t. p. line complete, often shaded distally with white; fringe white, darkened opposite veins. Hind wings white, with scattered pale grayish brown scales, otherwise as in nominate subspecies.

**UNDER SURFACE OF WINGS:** As in nominate subspecies.

**LENGTH OF FOREWING:** 9 to 12 mm.; holotype, 10 mm.

**FEMALE:** Head similar to that of male.

**UPPER SURFACE OF WINGS:** Forewings

similar to those of male, in some specimens less heavily suffused with dark scales, and with cross lines more prominent; s. t. line usually absent, rarely weakly suggested. Hind wings with outer margin weakly suffused with dark scales, producing an indistinct border, or without border as in male.

**UNDER SURFACE OF WINGS:** Similar to that of wings of male, but forewings paler, and with outer margins of both wings concolorous with basal portion of wing or with faint dark band.

**LENGTH OF FOREWING:** 9 to 13 mm.; allotype, 10 mm.

**MALE GENITALIA:** As in nominate subspecies.

**FEMALE GENITALIA:** As in nominate subspecies.

**EARLY STAGES:** Unknown.

**FOOD PLANT:** Unknown.

**TYPES:** Holotype, male, Palm Springs, Riverside County, California, April 8, 1956 (A. H. Rindge); allotype, female, same data, April 19, 1957. Paratypes, all from California, and listed by counties: *Riverside County*: Forty-one males and 37 females, same data as types, various dates in January, February, March, April, May, and July, 1922 (K. R. Coolidge), 1934, 1945–1957 (A. H. Rindge, F. H. Rindge); five males and 13 females, Palm Desert, various dates in March, April, May, and November, 1952–1956 (A. H. and S. K. Rindge, R. H. Reid); six males, Split Rock Tank, Mojave Desert, May 20, 1938 (G. H. and J. L. Sperry); one male and nine females, Cathedral City, April, 1938 (P. Work), April 3, 1946 (A. L. Melander); 11 males and 23 females, Shavers Well, April 1, 1935, May 1, 1938 (G. H. and J. L. Sperry, J. A. Comstock); one female, Indio, May 10, 1921; nine males and four females, Desert Center, October 18, 1931 (J. A. Comstock), February 24, 1955 (R. H. Reid); four females, 4 miles northwest of Desert Center, June 20, 1956 (M. Wasbauer); one male, McCoy Mountains, March 24, 1935; five males and one female, Coxcomb Mountains, February 28, 1937, March 2, 1937 (J. A. Comstock); three males and four females, Thermal, June 17, 1956 (M. Wasbauer); one male, Oasis, March 6, 1937; one male and one female, Dead Indian Creek, April 25, 1936 (Timberlake), January 24, 1947; four males and two females, Dead Indian Canyon, San Jacinto Mountains, March 3, 19, 1940 (G. Willett); one male, Chuckawalla Springs, Chuckawalla Mountains, February 20, 1935, December 30, 1939; 12 males and 27 females, Hopkins Wells, October 28, 1940 (G. Willett), April 16, 1958 (J. Powell); three males, Indian Wells, March 25, 1939 (L. M. Martin); one female, Wiley Wells, March 21, 1937 (J. A. Comstock); two males, Colorado desert, April (J. E. Cottle); two females, Indio, May 1, 1918 (J. C. Bradley), May 8, 1921 (E. Piazza); one male, Coachella, May 2, 1918 (J. C. Bradley). *San Diego County*: Four males, La Puerta Valley, July 11, September 20, 1911; eight males and three females, Bor-

rego, various dates in December, January, February, March, and July, 1940–1948 (G. H. and J. L. Sperry, N. Crickmer); two males and one female, Tub Canyon, Borrego, March, 1947–1948 (N. Crickmer); one male, Palm Canyon, Borrego, February 1, 1946 (A. L. Melander); one male, Yaqui Well, Borrego Desert Park, February 24, 1940 (D. Meadows); one male, Borrego Desert Park, February 9, 1941 (D. Meadows). *San Bernardino County*: Two males and one female, Walters Station, April; three males and six females, Vidal, September 14, 15, 16, 18, 1947 (D. Weedmark); 13 males and three females, Providence Mountains, April, May and June, 1934–1938 (G. H. and J. L. Sperry, L. M. Martin); one male and one female, Ivanpah Mountains, May 3, 1939 (L. M. Martin); one male, New York Mountains, April 5, 1937 (R. H. Andrews and L. M. Martin); two males, southwest of Parker Dam, February 24, 1951 (C. D. MacNeill); one male, Morongo Wash, May 11, 1937 (R. H. Andrews). *Imperial County*: Six males, Indian Well, March 27, 1955 (R. E. Ryckman, R. D. Lee, and D. Spencer); one male and five females, 6 miles west of Davis Lake, March 27, 1955 (R. E. Ryckman, R. D. Lee, and D. Spencer); 12 males and four females, Palo Verde, February 11, 1940 (G. Willett), August 17, 1946 (W. F. Barr); one male, San Felipe Wash, February 21, 1938 (G. H. and J. L. Sperry); one male and two females, 13 miles southwest of Wiley Well, February 16, 1941, March 24, 29, 1941 (W. D. Dyar). *Inyo County*: Two males, Shoshone, May 15, 1934 (G. H. and J. L. Sperry). One female, no data. Holotype and allotype in the collection of the American Museum of Natural History; paratypes in the collections of that institution, of the Los Angeles County Museum, of the United States National Museum, of the Museum of Comparative Zoölogy at Harvard College, of the Department of Entomology, Cornell University, of the Department of Entomology and Parasitology, University of California, Berkeley, of Charles Kimball, and of the author.

**RANGE:** Colorado and Mohave deserts of California. (See fig. 24.) This subspecies has been captured in every month of the year.

**REMARKS:** Three hundred and thirty-four specimens and 31 genitalic preparations were

examined. This population can be separated from the nominate one by its lighter color of the forewings above, and by the usually more distinct maculation. Specimens from near the Colorado River tend to approach typical *eupetheciaria*, and some overlapping probably occurs in this area. Specimens from the Providence Mountains are larger and darker, appearing more like *escaria*, but they do not have the enlarged tubercle of that species, so are tentatively placed under this name. There are two females labeled Mount Lowe, California, a Los Angeles County locality, April 16 and August 1; this locality needs to be verified.

***Glaucina eupetheciaria osiana* (Druce),  
new combination**

Plate 24, figures 8, 9; text figure 24

*Eupithecia* (?) *osiana* DRUCE, 1893, *Biologia Centrali-Americana, Insecta, Lepidoptera-Heterocera*, vol. 2, p. 147; 1893, *op. cit.*, vol. 3, pl. 55, figs. 5, 6.

**MALE:** Head, vertex, front, and palpi grayish brown, the scales with very narrow grayish white tips. Thorax grayish brown above, the scales with very narrow grayish white tips, grayish white below. Abdomen grayish brown, with scattered grayish white and blackish brown scales.

**UPPER SURFACE OF WINGS:** Forewings, ground color gray, evenly and heavily overlain with grayish brown scales, producing an even, grayish brown color, with virtually no maculation; t. a. and t. p. lines absent, rarely weakly indicated; discal dot usually elongate; s. t. line faint, pale; terminal line represented by intravenular dots or as narrow line; fringe concolorous with wing. Hind wings gray, overlain with grayish brown scaling, in some specimens slightly stronger around outer margin, otherwise as in nominate subspecies.

**UNDER SURFACE OF WINGS:** As in nominate subspecies but more overlain with grayish brown scales.

**LENGTH OF FOREWING:** 9 to 11 mm.

**FEMALE:** Head similar to that of male.

**UPPER SURFACE OF WINGS:** Forewings similar to that of wings of male, or slightly less heavily suffused with dark scales, and with cross lines prominent; s. t. and terminal areas usually darker than basal portion. Hind

wings with outer margin suffused with dark scales, producing a broad border.

**UNDER SURFACE OF WINGS:** Similar to that of wings of male, but forewings paler, and with outer margins of both wings broadly suffused with dark scales.

**LENGTH OF FOREWING:** 10 to 13 mm.

**MALE GENITALIA:** As in nominate subspecies.

**FEMALE GENITALIA:** As in nominate subspecies.

**EARLY STAGES:** Unknown.

**FOOD PLANT:** Unknown.

**TYPES:** Described from a male and a female; the former is hereby designated as the lectotype. Both of the type specimens are in the collection of the British Museum (Natural History).

**TYPE LOCALITY:** Northern Sonora, Mexico.

**RANGE:** Sonora and the Santa Rita Mountains of southern Arizona. (See fig. 24.) On the wing in March, April, May, July, August, and September.

**REMARKS:** Forty-six specimens and 16 genitalic preparations were examined. This population represents an opposite extreme to the very pale and more clearly marked population from southern California, and is more noticeable in the males of *osiana*, as they have evenly dark forewings with virtually no traces of cross lines. From the nominate Arizona subspecies, *osiana* can be separated by the more even grayish brown coloration of the primaries, compared with the more grayish color and more speckled appearance of the former. Both sexes of *osiana* have a more even, smoother appearance to the upper surface of the wings than is found in either of the preceding populations.

***Glaucina eupetheciaria escariola*, new subspecies**

Plate 24, figures 10, 11; text figure 24

**MALE:** Head, vertex, front, and palpi grayish black, with some grayish white scaling, the dark scales often with very narrow grayish tips. Thorax grayish black, the scales with very narrow grayish white tips, grayish white below. Abdomen grayish brown or grayish black, with scattered grayish white scales.

**UPPER SURFACE OF WINGS:** Forewings, ground color dark gray or gray, evenly and heavily overlain with black and grayish black

scales, producing an even, dark gray to grayish black color, with virtually no maculation; t. a. and t. p. lines weakly represented, in some specimens absent; discal dot usually elongate; s. t. line pale, faint to prominent, in some specimens shaded basally by faint dark band; terminal line black, narrow; fringe of ground color, darkened opposite veins. Hind wings whitish gray, overlain with pale grayish brown scaling, in some specimens slightly stronger around outer margin, otherwise as in nominate subspecies.

UNDER SURFACE OF WINGS: As in nominate subspecies.

LENGTH OF FOREWING: 10 to 11 mm.; holotype, 10 mm.

FEMALE: Head similar to that of male.

UPPER SURFACE OF WINGS: Forewings similar to those of male, with subterminal and terminal areas broadly darkened; maculation weakly represented, except for discal dot. Hind wings with outer margin broadly suffused with dark scales, producing a dark border.

UNDER SURFACE OF WINGS: Similar to that of wings of male, but forewing paler, and with outer margins of both wings broadly suffused with dark scales, producing a sharply contrasting white basal and dark border to the secondaries.

LENGTH OF FOREWINGS: 11 to 12 mm.; allotype, 11 mm.

MALE GENITALIA: As in nominate subspecies.

FEMALE GENITALIA: As in nominate subspecies.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPES: Holotype, male, 18 miles north of Rodeo, Hidalgo County, New Mexico, July 7, 1956 (E. Ordway); allotype, female, 13 miles north of Rodeo, Hidalgo County, New Mexico, June 16, 1956 (E. Ordway). Paratypes, two males and one female, same data as holotype; 10 females, same data as allotype; one male and two females, Cienaga Ranch, near Rodeo, Hidalgo County, New Mexico, July 12, 1948 (C. and P. Vaurie); one female, Deming, Luna County, New Mexico, July 8-15; five males, 10 miles east of Deming, July 12, 1917; six males and one female, Mesquite, near Mesilla Park, Dona Ana County, New

Mexico, July 12, 1917; one male, High Rolls, Otero County, New Mexico, June 8-15; one male, Davis Mountains, Brewster County, Texas, June 15-30; one male, Southwestern Research Station of the American Museum of Natural History, 5 miles west of Portal, Cochise County, Arizona, August 2, 1957, 5400 feet elevation (M. Statham); one female, Sonora (Morrison); one male, Rodeo, San Juan del Rio district, Durango, Mexico, July 29, 1947, 4700 feet elevation (W. J. Gertsch). Holotype, allotype, and paratypes in the collection of the American Museum of Natural History; paratypes in the collections of the United States National Museum, of the Museum of Comparative Zoölogy at Harvard College, of the British Museum (Natural History), and of the Department of Entomology, Cornell University.

RANGE: Western Texas, southwestern New Mexico, southeastern Arizona, Sonora, and Durango. (See fig. 24.) On the wing in June, July, and August.

REMARKS: Thirty-six specimens and 10 genitalic preparations were examined. This is the darkest-colored of the various known subspecific populations of *eupetheciaria*. The forewings of the males vary from slightly to very much darker than those of the nominate subspecies. This difference is more pronounced in the females, which are quite dark and have a broad and very dark terminal band on the secondaries in this population. Both sexes of *escariola* are more similar in color and maculation to those of *escaria* than they are to those of the other subspecies of *eupetheciaria*; however, they are smaller than *escaria* and do not have the very strong, central tubercle of that species.

#### *Glaucina elongata* (Hulst)

Plate 24, figure 12; text figures 23, 47, 82

*Coenocharis elongata* HULST, 1896, Trans. Amer. Ent. Soc., vol. 23, p. 353. DYAR, 1907, Jour. New York Ent. Soc., vol. 15, p. 106. CASSINO AND SWETT, 1924, Lepidopterist, vol. 4, p. 32. RINDGE, 1955, Bull. Amer. Mus. Nat. Hist., vol. 106, p. 142.

*Glaucina elongata*, GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 387.

MALE: Head, vertex and front grayish brown, the scales with narrow gray tips;



front similar in shape to that of *escaria*, tubercle slightly smaller, occupying about two-fifths of both length and width; palpi extending to lateral rim, grayish brown scaled, with narrow grayish white tips. Thorax pale brownish gray above, with scattered pale gray scales, whitish gray below; legs pale gray, with brown scaling, the tibiae dark-scaled except for ends of segments; fore tibia with process arising basad of middle of segment, with terminal spine-like process slightly longer than width of tibia. Abdomen brownish gray or gray, with scattered brown scales.

UPPER SURFACE OF WINGS: Forewings similar to those of *escaria*; ground color gray, heavily and evenly overlain with brownish gray scales, producing a brownish gray forewing, with cross lines weakly represented or obsolete; t. a. line weak or absent; discal dot weakly represented, slightly elongate; t. p. line weak, usually complete, in some specimens shaded distally by ground color, arising on costa about four-fifths of distance from base, subparalleling outer margin, outwardly produced on veins, with concave loop in cell  $Cu_2$ ; s. t. line absent; terminal area concolorous with remainder of wing; terminal line narrow, dark; fringe concolorous with wing. Hind wings whitish gray, overlain with pale brownish gray scales, otherwise as in *escaria*.

UNDER SURFACE OF WINGS: Similar to that of wings of *escaria*.

LENGTH OF FOREWING: 8 to 11 mm.

FEMALE: Front tending to be slightly wider and less high than in male, antennae of 37 to 39 segments; fore tibia with process arising at center of segment, and with spine-like projection from one and one-half to two times as long as width of segment.

UPPER SURFACE OF WINGS: Forewings similar to those of male, not so heavily suffused with dark scales, and with more prominent cross lines; discal dot elongate; subterminal and terminal areas usually slightly darker than base of wing. Hind wings with outer margin broadly suffused with dark scales, producing a dark border.

UNDER SURFACE OF WINGS: Similar to that of wings of male, but forewings slightly paler, and with secondaries having a broad, dark border; traces of t. p. line in some specimens present on primaries.

LENGTH OF FOREWING: 10 to 12 mm.

MALE GENITALIA: Very similar to those of *eupetheciaria*, but with terminal portion of sacculus arm tending to be thinner, only about one-half as wide as shoulder area.

FEMALE GENITALIA: Very similar to those of *eupetheciaria*. Membranous invaginations of intersegmental membrane arising from elongate, sclerotized bases, the sacs curving anteriorly and then medially, width of sac equal to width of collar-like structure of ductus bursae, without well-defined, sclerotized, inner, tube-like sac.

EARLY STAGES: Undescribed.

FOOD PLANT: *Koeberlinea spinosa*, variously called allthorn, spiny-scrub, junco, or crucifixion thorn.

TYPES: Hulst described *elongata* without giving any indication of the number of specimens he had before him; at least two were present, because Texas and Arizona are given as localities. Dyar (1907) discussed the type series, as one of the "type" males from Arizona was included in his type series of *erroraria*. Dyar stated that "the true type of this composite species is probably in the Hulst collection at New Brunswick, N. J." Grossbeck (1912) next discussed the problem of the type series, concluding that the type had to be a specimen from Texas, but did not designate any lectotype. Cassino and Swett (1924) state that "*tuconensis* [sic!] is smaller than *elongata* Hulst, the type of which we restrict to the ♂ or ♀ in the Hulst collection in New Brunswick, N. J." Under the name *elongata*, the Hulst collection had a male type from Arizona and a female type from Texas (Rindge, 1955). As the type must be the Texas specimen, it becomes the lectotype, following the Cassino and Swett designation; this specimen is in the collection of the American Museum of Natural History. The male, incidentally, is not conspecific, being a specimen of *eupetheciaria*.

TYPE LOCALITY: Texas.

RANGE: Southern and western Texas, in the eastern part of the Chihuahuan desert. (See fig. 23.) This species has been taken in the months from March to mid September.

REMARKS: Eighteen specimens and nine genitalic preparations were studied. This species fits in closely with *escaria* and *eupetheciaria*, but can be separated by the paler, brownish gray forewings, although in fresh

specimens the wing color tends to be darker, especially in the males. The tubercle of the front and the forewings of *elongata* are smaller than those of *escaria*, agreeing more closely with those of the various populations of *eupetheciaria* in these characters. From *escariola*, in New Mexico and southeastern Arizona, *elongata* can be separated by the paler coloration of the upper surface of both forewings and hind wings.

The male genitalia are extremely close to those of *eupetheciaria*, but apparently there is a difference in the width of the outer portion of the sacculus arm, it being thinner in *elongata* than in the preceding species. The female genitalia are also very similar to those of the preceding species and are separated from it mainly by the shape of the membranous sacs of the intersegmental membrane. In *elongata* they are larger, and arise from a smaller, less funnel-shaped base than is found in *eupetheciaria*.

## GROUP II

This small group differs from the preceding by the nature of the front, as it has a low, broadly swollen tubercle that occupies most of the front, with the ventrolateral margins extended towards the rim of the front. The front is about as wide as it is high, and the angle between the rim of the front and the vertex tends to be in the nature of a right angle. As a result, the dorsal portion of the head tends to project farther forward, beyond the eyes, than in the species of group I. The fore tibiae have a prominent spine-like projection, as in group I. In addition, the pectinations of the male antennae are longer, being about seven to nine times as long as their basal segments, and extend virtually to the end of the antenna; the antennae have 38 or 39 segments in the male, and 40 to 42 in the female.

In the male genitalia, the vesica is armed with a narrow, twisted, sclerotized strip, the valves have a broader costa, a very wide sclerotized band across the base connecting the costa and sacculus, and the sacculus has become somewhat twisted and terminates in three short spines. The sterigma of the female lacks the sharply defined plate found in group I, as it is a more membranous area. The ductus bursae consists of a short sclerotized area below the ostium, and the longer neck of

the corpus bursae is membranous, with some longitudinal striations being indicated. The signum tends to be stellate, although in some specimens rather weakly so.

This group is made up of three closely allied species. The maculation is more like that in some of the species of group IV than that in the preceding, and is characterized by the fact that the t. p. line is concave in the upper part of the wing and strongly inwardly oblique below the cell, meeting the inner margin basad of the center of the margin.

### *Glaucina golgolata* (Strecker)

Plate 24, figures 13, 14; text figures 25, 48, 83

*Eupithecia golgolata* STRECKER, 1899, Lepidoptera, Rhopaloceres and Heteroceres, suppl. no. 2, p. 11.

*Glaucina golgolata*, GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 390.

*Tephroclystis golgata* (sic!), DYAR, "1902" [1903], Bull. U. S. Natl. Mus., no. 52, p. 272. J. B. SMITH, 1903, Check list of the Lepidoptera of boreal America, p. 66.

*Glaucina golgata* (sic!), DYAR, 1907, Proc. Ent. Soc. Washington, vol. 7, p. 93.

*Glaucina mormonaria* DYAR, 1907, Jour. New York Ent. Soc., vol. 15, p. 106. GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 391, fig. 6 (male genitalia). New synonymy.

MALE: Head, vertex and front with a mixture of grayish brown and dark brown scales, the latter concentrated anteriorly on vertex between antennal bases and dorsolaterally on front; front with large, low, rounded tubercle, with ventrolateral margins tending to be extended, forming a weak transverse ridge, the ventral margin of tubercle with slight median indentation; palpi extending slightly beyond front, the scales brownish gray with white tips, and with some dark brown scales dorsally near end of second segment. Thorax pale grayish brown above, light gray below; legs grayish brown, with the tibiae darker brown; fore tibiae with process arising one-third of distance from base, with terminal spine-like projection about twice as long as width of tibia. Abdomen light gray, with scattered grayish brown and brown scales, the latter tending to become more concentrated posteriorly, with traces of double dorsal line, a lateral line, and a double ventral line indicated by faint groups of dark scales.

UPPER SURFACE OF WINGS: Forewings

with ground color light gray, unicolorous, with scattered grayish brown and brown scales, these tending to be concentrated along costal and outer margins, the maculation varying from distinct to obsolescent, with the t. p. line and subterminal lines usually present; t. a. line usually represented by a brown-black spot on vein Sc, a patch distad thereto in cell, then going sharply inwardly oblique, appearing as venular spots and sometimes having a weak line connecting them, meeting inner margin one-fifth or one-sixth of the distance from base; discal dot absent; median shade line dark grayish brown, rather nebulous, stronger in lower portion of wing where it swings strongly basad; t. p. line black or blackish brown, usually distinct and complete, more strongly represented on veins than in cells, arising three-fourths of distance from base, forming a concave bow to veins  $M_3$  and  $Cu_1$ , then subparalleling outer margin to meet inner margin basad of center, usually shaded distally by a band of ground color; subterminal area becoming brown or dark brown next to s. t. line, the latter usually complete, white, strongly produced basally on veins; terminal line dark, complete, with small, intravenular spots; fringes concolorous with wing, with narrow, light gray basal area. Hind wings light gray, heavily suffused with grayish brown, with distal margin darker, the anal margin grayish white, with scattered dark brown scales; maculation usually absent except for indications of post-median and subterminal line in anal margin, the former rarely continued across wing; terminal line and fringe as on forewings.

**UNDER SURFACE OF WINGS:** Forewings unicolorous pale grayish brown, the costa and apex slightly darker; hind wings grayish white, evenly sprinkled with brown scales; both wings without maculation, except for faint discal dots that may be present; terminal line present on both wings, brown; fringe as above.

**LENGTH OF FOREWING:** 12 to 16 mm. A series of 16 Utah specimens averages 14.6 mm., and three California males average 14.7 mm.

**FEMALE:** Front similar to that of male, tubercle slightly more flattened; fore tibia with process arising near middle of segment.

**UPPER SURFACE OF WINGS:** Forewings as

in males, with the maculation slightly better represented. Hind wings as in males.

**UNDER SURFACE OF WINGS:** All wings tending to be broadly darkened distally, and with discal dots present.

**LENGTH OF FOREWING:** 12 to 16 mm. Measurements on 27 Utah females average 13.9 mm., while those on 28 California specimens average 14.4 mm.

**MALE GENITALIA:** Uncus with ventral margins of basal one-half parallel or nearly so, then angled inward, with concave sides to bluntly pointed apex, the sclerotized point located ventrad of apex; gnathos of even width, median area slightly swollen, with roughened surface; valves with costa produced, spinose apical portion twisted at almost a right angle to surface of inner face of valve, with swelling before apex, anterior margin on inner face of valve widening opposite costal swelling to unite with very broad, anteriorly extending, sclerotized area; sacculus with broad, flat, heavily sclerotized base, anterior margin produced ventrally, narrowing distally, with slight constriction beyond middle, terminal area tubular, ventrally ending in two separate, heavy spines, dorsally with a single, inward-pointing spine; anellus lying between sacculus bases, with juxta plate three-fourths as wide as base of uncus, slightly longer than wide, median membranous area poorly defined or absent; saccus subequal in length to length of tegumen, extending slightly beyond base of valves; aedeagus subequal in length to combined lengths of tegumen and saccus, slender; vesica with sclerotized strip rather weakly represented.

**FEMALE GENITALIA:** Sterigma lightly sclerotized, rounded, surrounded by several concentric, shallow ridges or folds; ductus bursae sclerotized, tapering, very short; corpus bursae with narrow, striated neck, at least twice as long as length of ductus bursae, the body of corpus bursae ovate or elliptical, slightly longer than neck; signum tending to be round, with strongly stellate margins but with relatively few rays.

**EARLY STAGES:** Unknown.

**FOOD PLANT:** Unknown.

**TYPES:** The unique female type of *golgolata* is in the collection of the Chicago Natural History Museum.

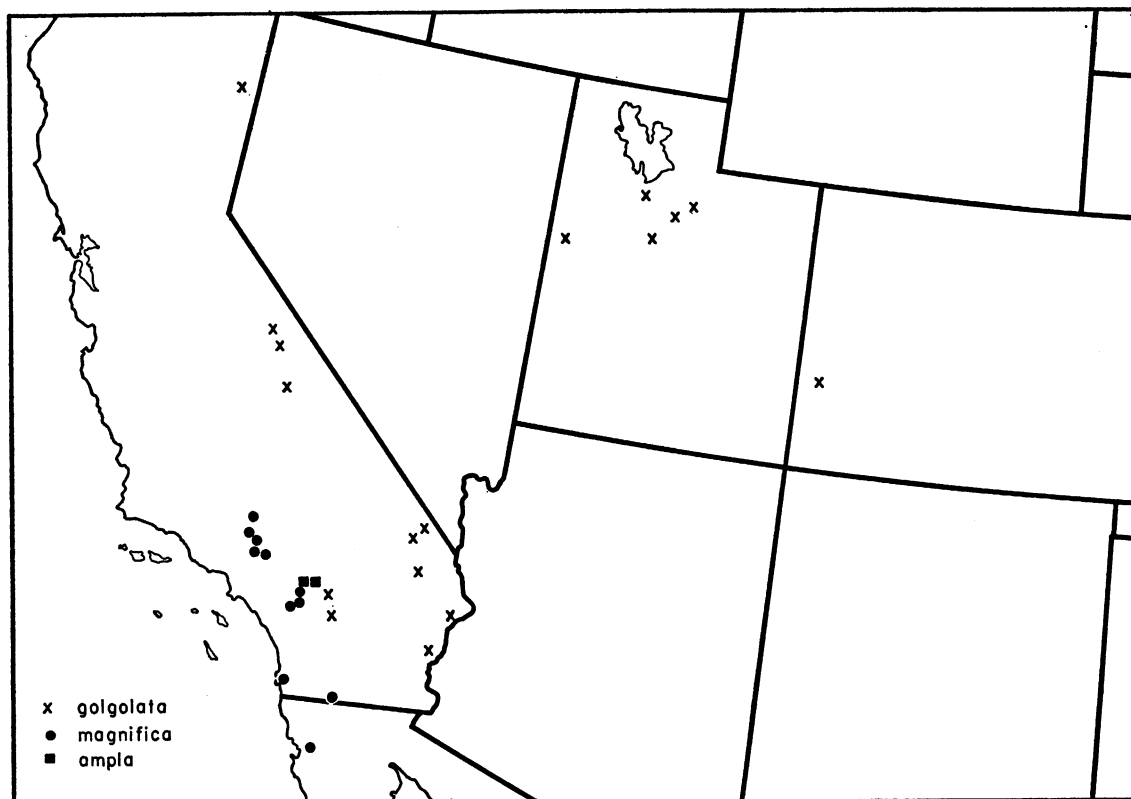


FIG. 25. Distribution of *Glaucina golgolata* (Strecker), *magnifica* Grossbeck, and *ampla*, new species.

Dyar described *mormonaria* from six specimens, four males and two females, all from Stockton, Utah. The male specimen bearing the United States National Museum type number 10280 in the type collection of that institution is hereby designated as the lectoholotype; the male genitalia are on slide November 5, 1936, J. F. G. C. No. 749.

TYPE LOCALITIES: Nevada (*golgolata*); Stockton, Tooele County, Utah (*mormonaria*).

RANGE: The Great Basin Desert of western Colorado, Nevada, Utah, and the desert areas of California east of the Sierra Nevada Mountains, extending south into the Mohave and Colorado desert areas of southern California. (See fig. 25.) On the wing from July into November, with a single April record noted.

REMARKS: One hundred and sixty-two specimens and 22 genitalic preparations were studied, including the type. This species can be separated from all the preceding by the characters given in the description for group II.

#### *Glaucina magnifica* Grossbeck

Plate 24, figures 15, 16; text figures 25, 49, 84

*Glaucina magnifica* GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 390.

MALE: Head, vertex and front with a mixture of grayish white and brown scales, the latter concentrated anteriorly on vertex between antennal bases and dorsolaterally on front; front with large, low, rounded tubercle, with ventrolateral margins extended to meet rounded lateral ridge, the ventromedian area of tubercle depressed; palpi extending slightly beyond front, the scales light brownish gray with white tips, and with some dark brown scales dorsally near end of second segment. Thorax grayish brown above, paler below; legs grayish brown or brown, with the tibiae darker brown; fore tibiae with process arising one-third of distance from base, with terminal spine-like projection slightly more than twice as long as width of tibia. Abdomen with a mixture of light gray, brown, and black-brown scales above, in many specimens with

a double dorsal line, a lateral line, and a faint double ventral line indicated by groups of dark scales, especially on posterior margins of segments.

**UPPER SURFACE OF WINGS:** Forewings with ground color light grayish brown, unicolorous, with scattered brown and light gray scales, with the maculation as in *golgolata*; t. a. line usually incomplete, represented by venular spots and sometimes by a weak line connecting them, in general course sharply inwardly oblique; a faint, indistinct, median shade line in some specimens present in lower portion of wing; t. p. line black or blackish brown, usually distinct and complete; subterminal area becoming darker next to s. t. line, the latter more or less complete. Hind wings pale grayish brown, the anal margin whitish, with scattered dark brown scales; maculation usually absent except for indications of post-median and subterminal lines in anal margin, the former rarely continued across wing; terminal line and fringe as on forewings.

**UNDER SURFACE OF WINGS:** Forewings unicolorous pale grayish brown, the costa slightly darker; hind wings grayish white, evenly sprinkled with brown scales, the costa tending to be slightly darker; both wings without maculation; terminal line absent or very faint; fringes concolorous with wings.

**LENGTH OF FOREWING:** 14 to 18 mm. A series of 81 topotypes averages 15.8 mm.

**FEMALE:** Front similar to that of male, tubercle slightly more flattened; fore tibia with process arising basad of middle of segment.

**UPPER SURFACE OF WINGS:** Forewings as in males, with the maculation slightly better represented. Hind wings similar to those of males, but with postmedian line tending to be weakly represented, shaded distally by a band of light gray.

**UNDER SURFACE OF WINGS:** All wings tending to be broadly darkened distally, and with discal dots present.

**LENGTH OF FOREWING:** 16 to 17 mm. A series of six topotypes averages 16.3 mm.

**MALE GENITALIA:** Similar to those of *golgolata* but slightly larger; juxta plate as wide as base of uncus, width greater than length, terminally tapering, with median membra-

nous area continued posteriorly as finely spinose area; vesica with narrow, slightly twisted strip occupying one-third of length of aedeagus.

**FEMALE GENITALIA:** Similar to those of *golgolata* but with corpus bursae slightly smaller and with neck thereof a bit more clearly defined; signum prominent, as wide as length of ductus bursae, somewhat quadrate, with dentate edges, the rays usually less than one-half as long as length of signum, the anterolateral rays in some specimens tending to be best developed.

**EARLY STAGES:** Unknown.

**FOOD PLANT:** Unknown.

**TYPES:** This species was "described from many specimens of both sexes" according to the original description. The specimen bearing Grossbeck's "male type" label, with my genitalic dissection number 3064, is hereby designated as the lectoholotype, and the moth with "female type" label, my dissection number 3111, is hereby designated as the lectoallotype. Both these specimens are in the collection of the American Museum of Natural History.

**TYPE LOCALITY:** San Diego, San Diego County, California.

**RANGE:** The coastal areas of southern California and northern Baja California. (See fig. 25.) On the wing from September through December, and in February.

**REMARKS:** One hundred and sixty-one specimens and 15 genitalic preparations were examined. A large series of male topotypes shows relatively little variation, but the females are too few to be adequately compared.

This insect is very closely allied to *golgolata*, and there is a possibility that it should be considered a subspecies of that moth. Certain small differences are present, however, such as the shape of the front, the larger size, and a darker and less contrasting wing color. The pattern of the forewings is almost identical in the two, but it is more apparent in *golgolata*, perhaps owing to the paler ground color of the wings.

The genitalia are very similar to those of *golgolata*. The juxta of the male is slightly wider and shorter than in *golgolata*, and the sclerotized strip of the vesica is slightly more prominent. In the female, the entire genitalia

tend to be slightly shorter, and the signum is larger, less rounded, and with more and shorter rays.

***Glaucina ampla*, new species**

Plate 24, figures 17, 18; text figures 25, 50

**MALE:** Head, vertex, front, and palpi with a mixture of black or grayish black and light gray scales; front with large, low, rounded tubercle, with ventrolateral margins extended to meet rounded lateral ridge, the ventromedial area of tubercle without depression or with one that is very small. Thorax and abdomen dark gray above, paler below.

**UPPER SURFACE OF WINGS:** Forewings with ground color gray, unicolorous, with scattered black-brown and light gray scales, the general tone being a dark gray; maculation as in *magnifica* but less clearly defined; t. a. line and median shade usually absent; t. p. line incomplete or weakly represented, often shaded distally by a band of ground color; subterminal area slightly darkened, filling the outward bends of indistinct s. t. line. Hind wings as in *magnifica*, but grayer.

**UNDER SURFACE OF WINGS:** Forewings unicolorous gray, the costa slightly darker; hind wings grayish white, evenly sprinkled with gray-brown scales; both wings without maculation; terminal line present.

**LENGTH OF FOREWING:** 16 to 19 mm.; holotype, 17 mm. The series of 57 males averages 17.6 mm. in wing length.

**FEMALE:** Similar to male, but with maculation slightly better represented.

**LENGTH OF FOREWING:** 15 to 18 mm.; allotype, 17 mm. The series of 40 females averages 16.6 mm. in wing length.

**MALE GENITALIA:** Similar to those of *magnifica*, but with a slightly larger median membranous area in the juxta plate.

**FEMALE GENITALIA:** Similar to those of *magnifica*.

**EARLY STAGES:** Unknown.

**FOOD PLANT:** Unknown.

**TYPES:** Holotype, male, Upper Santa Ana River, San Bernardino County, California, September 2, 1948 (G. H. and J. L. Sperry); allotype, female, same data, August 29, 1948. Paratypes, 54 males and 38 females, same data as types, various dates in late July, August, and September, 1945-1949; three

males and one female, Barton Flats, San Bernardino County, California, August 31, September 1, 11, 1945 (G. H. and J. L. Sperry). Holotype and allotype in the collection of the American Museum of Natural History; paratypes in the collection of that institution, of the Los Angeles County Museum, and of C. P. Kimball.

**RANGE:** The mountainous areas of southern California. (See fig. 25.) On the wing from late July to September.

**REMARKS:** Ninety-eight specimens and seven genitalic preparations have been studied. This species can be distinguished by the grayer primaries, with indistinct maculation as contrasted with those of *magnifica*, which has grayish brown forewings with more distinct and more contrasting maculation. The present species is larger, as the wing length averages 17.6 mm. for the males and 16.6 mm. for the females, as opposed to 15.8 mm. and 16.3 mm. for the males and females of *magnifica*. *Glaucina magnifica* is found in the coastal areas of southern California, while *ampla* is known from the San Bernardino Mountains at elevations of about 6000 feet.

It is quite possible that this population should be placed as a subspecies of *magnifica* rather than designated as being a new species. This montaine population is on the wing from late July to mid or late September (September 26 being the latest date), while *magnifica* does not begin flying until the first or second week in September (September 4 is the earliest date). Although there is some overlap of flight periods, most specimens of *ampla* have been taken in August, while October seems to be the peak month for *magnifica*. This apparent isolation in time of flight, together with the geographic isolation, would indicate that specific rank should be used.

### GROUP III

This group is also small and differs in having the fore tibia without the terminal spine-like projection and the hind tibia without the upper pair of spurs. The front is variable, as species with the type of front found in both group I and group IV are represented. In the male genitalia, the sacculus is in the form of a very long, slender, evenly curved arm that

is longer than the length of the costa. The female genitalia, insofar as they are known, have a membranous sterigma, a very short, sclerotized ductus bursae, and an elongate corpus bursae, with a large, transverse signum with stellate margins.

Three species are placed in this group, two from Mexico and one from the desert areas of southern California. The maculation is either weakly represented or is absent altogether, and the secondaries tend to be about the same color as the primaries.

#### KEY TO SPECIES OF GROUP III

1. Front with central tubercle . . . . . *bifida*  
Front without central tubercle . . . . . 2
2. Front higher than wide; antennae with 32 segments . . . . . *ouden*  
Front as wide as high; antennae with 36 segments . . . . . *gertschi*

#### BASED ON MALE GENITALIA

1. Apex of uncus bifurcated . . . . . *bifida*  
Apex of uncus with a single point . . . . . 2
2. Saccus arm evenly curved, slightly C-shaped; length of juxta two-thirds of the width of base of uncus . . . . . *ouden*  
Saccus arm recurved, slightly S-shaped; length of juxta equal to width of base of uncus . . . . . *gertschi*

#### *Glaucina bifida*, new species

Plate 24, figure 19; text figure 51

**MALE:** Head, vertex and front grayish brown, with some light gray scaling on front; front with large, low, rounded, central tubercle, laterally with weak indentation between tubercle and rounded lateral ridge, dorsally the front sloping backward, ventrally having a wide transverse indentation; palpi rising to just below middle of eye, grayish brown basally, becoming dark brown distally; tongue reduced, weakly represented; antennae of 38 segments, with terminal seven segments simple, the longest pectinations about five times as long as antennal segments. Thorax grayish brown above, slightly paler below; legs brownish gray; fore tibial process arising at center of segment and extending beyond distal margin. Abdomen brown above and below, with scattered gray scales.

**UPPER SURFACE OF WINGS:** Forewings with ground color a unicolorous grayish brown; without maculation of any kind; ter-

minal line faintly suggested; fringe concolorous with wing. Hind wing gray, the anal margin slightly paler, with scattered brown and gray-brown scales; maculation absent; terminal line and fringe as on forewings.

**UNDER SURFACE OF WINGS:** Forewings unicolorous pale grayish brown, the costa and apex with scattered brown scales; hind wings grayish white, evenly sprinkled with brown scales; both wings without maculation; terminal line absent or very faint; fringes concolorous with wings.

**LENGTH OF FOREWING:** 12 to 13 mm.; holotype, 12 mm.

**FEMALE:** Unknown.

**MALE GENITALIA:** Uncus tapering, apical area broadly bifurcated, forming two thick dorsoventral lobes, their maximum width equal to about two-thirds of the width of base of uncus; gnathos of equal width, pointed medially; valves with costa produced, with swelling before spinose apex, maximum width less than one and one-half of the width of base of uncus, uniting near base with anteriorly extending sclerotized area; saccus base meeting at midline, with rough surface, this area being longer than anellus, saccus arm arising distad to roughened area from tapering, curved base, very long and narrow, evenly curved, slightly C-shaped, extending beyond outer margin of valve, terminating in a short, spine-like point; anellus with juxta plate small, ovate, in length equal to two-thirds of width of base of uncus; saccus subequal in length to length of tegumen, extending beyond base of valves in form of tapering and extended point; aedeagus elongate, in length subequal to combined lengths of uncus, tegumen, and saccus, slender, slightly bent and wider at base; vesica with a single cornutus, one-half as long as aedeagus, terminating in four to six short, sclerotized teeth.

**EARLY STAGES:** Unknown.

**FOOD PLANT:** Unknown.

**TYPES:** Holotype, male, Split Rock Tank, Mojave Desert, Riverside County, California, May 20, 1938 (G. H. and J. L. Sperry). Paratypes, two males, same data, May 19 and 20, 1938. All specimens in the collection of the American Museum of Natural History.

**RANGE:** Known only from the type series, taken in May.



REMARKS: Three specimens and two genitalic preparations were examined. This species can be separated from all the preceding by the characters given in the description for group III.

The male genitalia are unique in this genus in having the uncus broadly bifurcated; the species is also distinguished by having the aedeagus as long as the combined lengths of the uncus, tegumen, and saccus.

*Glaucina ouden* (Dyar), new combination

Plate 25, figure 1; text figures 52, 85

*Caenocharis (sic!) ouden* DYAR, 1913, Proc. U. S. Natl. Mus., vol. 44, p. 309.

MALE: Head, vertex and front grayish brown, with some light gray scaling ventrally on front, and with some elongate scales; front flat, with dorsolateral areas swollen, converging dorsally, making the front subtriangular in outline, higher than wide; palpi rising to just below middle of eye, extending beyond front, grayish brown, the scales with white tips; tongue normal; antennae of about 32 segments, with terminal four or five segments simple, the longest pectinations about five times as long as antennal segments. Thorax grayish brown above, slightly paler below; legs brownish gray; fore tibial process arising basad of center of segment and extending to just beyond distal margin. Abdomen brownish gray above and below.

UPPER SURFACE OF WINGS: Forewings with ground color a unicolorous grayish brown, with a faint glossy reflection; t. a. line absent or weakly indicated, when present curving outward across cell, then turning basad and going straight across wing, meeting inner margin one-third of distance from base; t. p. line a narrow, pale, rather indistinct band, concave between veins, extending straight across wing, in some specimens bordered basally at end of median area by slightly darker scaling; terminal line faintly suggested; fringe concolorous with wing. Hind wing concolorous with primaries or slightly lighter in color; anal margin gray, with dark brown scales; traces of post-median line at anal margin, extending part way across wing; terminal area slightly darker than rest of wing; terminal line and fringe as on forewings.

UNDER SURFACE OF WINGS: Forewings

unicolorous grayish brown, with faint glossy reflection; hind wings grayish, heavily covered with brown scales; both wings without maculation; terminal line absent or very faint; fringes concolorous with wings.

LENGTH OF FOREWING: 10 to 12 mm.

FEMALE: Similar to male.

LENGTH OF FOREWING: 11 mm.

MALE GENITALIA: Uncus tapering to single, ventrally curving point; gnathos with median area broadened, bluntly pointed, the surface roughened; valves with costa produced, with slight swelling before spinose apex, the spining continued anterobasally for less than one-half of distance to base of costa, maximum width one-half of the width of base of uncus, uniting at base with sclerotized strip of even width; sacculus bases separated by juxta plate, rounded, with median and posterior margins finely pitted, sacculus arm arising from this basal area, long and narrow, evenly curved, slightly C-shaped, extending beyond outer margin of valve, terminating in a spine-like point one-half of the width of base of uncus, anterior margin of sacculus with several setae on a small lobe; anellus with juxta plate small, posterior margin tapering, in length about two-thirds of the width of base of uncus; saccus subequal in length to length of tegumen, extending beyond base of valves as blunt point; aedeagus shorter than combined lengths of tegumen and saccus, slender, of uniform width; vesica with very narrow, sclerotized strip, one-third to one-half of the length of aedeagus.

FEMALE GENITALIA: Sterigma membranous; ductus bursae a short, sclerotized tube, twice as long as wide; corpus bursae very long and slender, pear-shaped, completely membranous; signum prominent, twice as wide as width of ductus bursae, with elongate teeth on margins and a few shorter teeth centrally.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPES: Dyar described this species from two male specimens. The one from Tehuacan, Mexico, September, 1911 (R. Müller), is hereby designated as the lectoholotype, being type number 14520 in the collection of the United States National Museum.

TYPE LOCALITY: Tehuacan, Puebla.

**RANGE:** The central Mexican states of Guerrero, Michoacan, and Puebla. The adults have been captured in June, September, October, and December.

**REMARKS:** Forty-seven specimens and four genitalic preparations were examined. This species can be distinguished from the preceding one by the different shape of the front, the smaller number of segments in the antennae, and by the fact that the forewings have two faint cross lines. It should be noted, however, that worn and faded specimens of *ouden* tend to lose the pattern. Very little can be said about the females, as but a single one is known.

The male genitalia are more "normal" than are those of the preceding species, as the uncus and aedeagus are of the usual type.

***Glaucina gertschi*, new species**

Plate 25, figure 2; text figure 53

**MALE:** Head, vertex and front grayish brown, with some light gray scaling on front; front with central area gently rounded, the dorsolateral areas swollen, height of front equal to width, dorsally sloping backward; palpi not reaching middle of eye, extending slightly beyond front, grayish brown, the scales whitish distally; tongue normal; antennae of 36 segments, with terminal five segments simple, the longest pectinations about five times as long as antennal segments. Thorax grayish brown above, slightly paler below; legs brownish gray; fore tibial process arising basad of center of segment and extending to just beyond distal margin. Abdomen brownish gray above and below.

**UPPER SURFACE OF WINGS:** Forewings with a unicolorous grayish brown ground color, some of the scales with grayish white tips; t. a. and t. p. lines extremely faint, in position apparently much as in *ouden*; terminal line complete, dark brown; fringe concolorous with wing. Hind wing concolorous with primaries or slightly lighter in color; anal margin gray, with dark brown scales; traces of post-median line at anal margin, extending part way across wing; terminal line and fringe as on primaries.

**UNDER SURFACE OF WINGS:** Forewings unicolorous grayish brown; hind wings grayish, heavily covered with brown scales; both

wings without maculation except for terminal line; fringes concolorous with wings.

**LENGTH OF FOREWING:** 13 (holotype) to 14 mm.

**FEMALE:** Unknown.

**MALE GENITALIA:** Uncus tapering to a single, slightly curved point; gnathos with median area flattened, evenly rounded, the surface roughened; valves with costa produced, with gently curved swelling before spinose apex, the spining continued anterobasally for more than one-half of distance to base of costa, maximum width two-thirds of the width of base of uncus, uniting at base with sclerotized strip much broadened at juncture; sacculus bases separated by juxta plate, somewhat truncated medially, with median and posterior margins finely pitted, sacculus arm arising from this basal area, long and narrow, recurved, shallowly S-shaped, extending beyond outer margin of valve, terminating in a spine-like point one-half of the width of base of uncus, anterior margin of sacculus with raised area containing setae; anellus with juxta plate moderate, posterior margin tapering, equal in length to width of base of uncus; saccus subequal in length to length of tegumen, extending beyond base of valves as blunt point; aedeagus equal in length to combined lengths of tegumen and saccus, slender, becoming gradually swollen anteriorly; vesica unarmed.

**EARLY STAGES:** Unknown.

**FOOD PLANT:** Unknown.

**TYPES:** Holotype, male, Matachic, Chi-huahua, Mexico, July 7, 1947 (W. J. Gertsch). Paratype, one male, same data. Both specimens in the collection of the American Museum of National History.

**RANGE:** Known only from the two type specimens.

**REMARKS:** Two specimens and one genitalic preparation were examined. The species can be distinguished from *ouden* by the different shape of the front, as the height is equal to the width, by the fact that the antennae have more segments, and by its larger size. *Glaucina gertschi* is the largest known species of this group.

The male genitalia can be separated from those of *ouden* by the rounded median area of the gnathos, the wider costal area of the

valves, the S-shaped sacculus arm, and by the larger juxta.

This species is named in honor of my friend and colleague, Dr. Willis J. Gertsch, who collected these specimens.

#### GROUP IV

This group of *Glaucina* is characterized by having the dorsolateral areas of the front swollen to form two dorsally converging ridges. In many of the species this is a prominent feature, but there is a graduated series of species in which the ridges become less and less prominent, ending with a few that have an almost flat front. The fore tibia lack the spine-like projection at the distal end of the tibia; both pairs of spurs are present on the metathoracic tibia. The male genitalia have the sacculus arm as a straight structure of varying length, terminating in several to many spines; the arm is either tubular or flattened, with a swollen apex. The costa is enlarged medially, both posteriorly and anteriorly, and the armament of the vesica varies from a single, large, sclerotized spine to a thin, twisted, often dentate, sclerotized strip. The female genitalia are of two main types. In the first the lamella postvaginalis is rounded and well sclerotized, the ductus bursae is short and broad, the corpus bursae has an elongate, longitudinally striated neck, and the signum is a sclerotized body with a prominent, inwardly pointing, transverse ridge. The second type has a less strongly sclerotized and often membranous lamella postvaginalis, a small ductus bursae, and a corpus bursae that has either a shorter neck with striations that tend to be somewhat circular, or a short, thick, heavily sclerotized structure, and a stellate signum.

Group IV is the largest subdivision of *Glaucina*, as it contains 19 species. Of these, four have been divided into subspecies. The center of distribution of this group appears to be the southern Rocky Mountain states. The various species extend outward from this area, with some ranging north up the Rocky Mountains and into the Great Basin area to Washington and Idaho, and south as far as the mountainous areas of central Mexico. To the east they occur in Texas, and they extend westward to California and Baja California.

#### KEY TO SPECIES BASED ON MALE GENITALIA<sup>1</sup>

1. Vesica armed with a single, elongate, tapering, heavy cornutus; sacculus arm with at least the terminal one-fourth of outer surface covered with numerous spines . . . . . 2
- Vesica armed with a thin, curved, often dentate strip; sacculus arm with terminal spines only . . . . . 7
- 2(1). Sacculus arm narrower than, and as long as, or longer than, aedeagus . . . . 3
- Sacculus arm as wide as, and shorter than, aedeagus . . . . . 5
- 3(2). Sacculus arm longer than aedeagus, extending almost to apex of valve, and with terminal portion slightly bent. . . . . *interruptaria*
- Sacculus arm equal in length to aedeagus, extending about six-sevenths of the length of the costa, straight . . . . 4
- 4(3). Terminal one-fourth of sacculus arm with short spines; spine of vesica about three-fifths of length of aedeagus . . . . . *spaldingata*
- Terminal two-fifths of sacculus arm with short spines; spine of vesica about three-tenths of length of aedeagus . . . . . *infumataria*
- 5(2). Sacculus arm extending about two-thirds of the length of the costa; length of cornutus from three-fifths to seven-tenths of the length of the aedeagus . . . . . *nephos*
- Sacculus arm about one-half of the length of the costa . . . . . 6
- 6(5). Sacculus arm about seven-tenths of the combined lengths of the tegumen and saccus; length of cornutus from one-fourth to three-fifths of the length of the aedeagus . . . . . *gonia*
- Sacculus arm about three-fifths of the combined lengths of the tegumen and saccus; length of cornutus about two-thirds of the length of aedeagus . . . . . *platia*
- 7(1). Sacculus arm terminating in four or more spines . . . . . 8
- Sacculus arm with only two spines, rarely three or four . . . . . 10
- 8(7). Aedeagus with prominent apical tooth and several small teeth . . . . *spina*
- Aedeagus without apical teeth . . . . 9
- 9(8). Length of sacculus arm nine-tenths of the combined lengths of the tegumen and

<sup>1</sup> The male of *panda* is not known.

- saccus; length of dentate strip of vesica one-half of the length of aedeagus . . . . . *ignavaria*
- Length of sacculus arm three-fourths of the combined lengths of the tegumen and saccus; length of dentate strip of vesica one-fourth of the length of aedeagus . . . . . *foeminaria*
- 10(7). Length of sacculus arm equal to combined lengths of the tegumen and saccus . . . . . *dispersa*
- Length of sacculus arm shorter than the combined lengths of the tegumen and saccus . . . . . 11
- 11(10). Length of sacculus arm at least two-thirds of the combined lengths of the tegumen and saccus . . . . . 12
- Length of sacculus arm one-half or less of the combined lengths of the tegumen and saccus . . . . . 14
- 12(11). Sacculus arm extending three-fifths of the length of the costa . . . . . 13
- Sacculus arm extending one-third to two-fifths of the length of the costa . . . . . *imperdata*
- 13(12). Costa of valve swollen, the width of this swelling three-fourths of width of base of valve . . . . . *lowensis*
- Width of costal swelling slightly larger than width of base of valve. . . . . *nota*
- 14(11). Sacculus arm longer than length of uncus . . . . . 15
- Sacculus arm equal to, or slightly shorter than, length of uncus . . . . . 16
- 15(14). Dentate strip of vesica two-fifths of the length of the aedeagus, terminally with long, thin teeth . . . . . *denticularia*
- Dentate strip three-eighths of the length of the aedeagus, terminally with rather short, stouter teeth . . . . . *eureka*
- 16(14). Vesica with posterior end of sclerotized strip flattened, truncate, the ventral margin with several teeth . . . . . *ochrofuscaria*
- Vesica with posterior end of sclerotized strip not flattened, with one large and several small teeth, ventral margin smooth . . . . . *loxa*

***Glaucina interruptaria interruptaria* (Grote),  
new combination**

Plate 25, figures 3, 4; text figures 26, 54, 86

*Tornos interruptaria* GROTE, 1882, Canadian Ent. vol. 14, p. 185.

*Lepiodes interruptaria*, HULST, 1887, Ent. Amer., vol. 3, p. 11.

*Lepiodes (Tornos) interruptaria*, HULST, 1888, Ent. Amer., vol. 4, p. 49.

*Coenocharis interruptaria*, HULST, 1896, Trans. Amer. Ent. Soc., vol. 23, p. 353. Dyar, 1903, Proc. Ent. Soc. Washington, vol. 5, p. 226. GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 392 (*partim*, not fig. 8).

*Coenocharis spaldingata jemezata* CASSINO AND SWETT, 1923, Lepidopterist, vol. 4, p. 6. New synonymy.

MALE: Head, vertex dark gray, the scales narrowly light gray apically, in some specimens with light gray scaling posteriorly and near antennal bases; front dark gray, with variable amount of grayish white scaling dorsolaterally and ventrally, dorsolateral areas strongly swollen, steep-sided, well separated dorsally, extending ventrally almost to lower margin of front, with central area slightly swollen and forming a vertical ridge; palpi dark gray, with scattered grayish scales; antennae of from 36 to 42 segments. Thorax above gray, with mixed pale and dark gray scales, white-tipped, with some grayish brown and grayish white scales; below pale gray; legs grayish brown, with darker tibiae, the segments narrowly bordered distally with white. Abdomen gray or grayish brown above, with variable amounts of dark scaling, the latter in some species forming an indistinct, double, dorsal line; below paler.

UPPER SURFACE OF WINGS: Forewings, ground color varying from light gray to dark gray, with scattered grayish brown and blackish gray scales; t. a. line black, narrow, arising on costa approximately one-fourth of distance from base, going sharply outward into cell, extending to about one-half of the length of the wing, swinging sharply basad in cell and crossing cubital vein about one-third of distance from base, then sharply angled outward again, forming a loop and connecting with t. p. line, arising on costa about seven-eighths of distance from base, running parallel with outer margin, with outward points on veins, concave between, often with projections on veins  $M_3$  and  $Cu_1$  extending farther distad than others; lower portion of t. a. line meeting inner margin about one-fifth of distance from base, extending parallel with costa across anal vein, then curving distally, paralleling veins, forming a second loop with t. p. line, separated from upper loop by 0.5 to 1.0 mm., curving sharply basad and meeting inner margin again at one-

half of distance from base; area distad of t. p. line often narrowly light gray; outer portion of wings broadly suffused with dark scales, in some specimens interrupted by faint s. t. line; terminal line narrow, dark; fringe concolorous with outer portion of wing. Hind wings pale gray or grayish brown, anal margin white, with scattered dark brown or brownish gray scales; maculation absent except for post-discal line, prominent above anal angle, extending part way or completely across wing, becoming faint in middle of wing, usually bordered distally by slightly paler band; terminal line and fringe as on forewings.

**UNDER SURFACE OF WINGS:** Forewings pale gray or grayish brown, with scattered brown or brownish gray scales, especially along costa and near apex; hind wings grayish white, suffused with brown or brownish gray scales; both wings without maculation except for narrow terminal line; fringes as above.

**LENGTH OF FOREWING:** 11 to 19 mm.

**FEMALE:** Similar to male.

**LENGTH OF FOREWING:** 12 to 16 mm.

**MALE GENITALIA:** Uncus with width of base equal to length of uncus, the apex curved ventrally, terminating in a sclerotized point; gnathos with small median enlargement, usually slightly bilobed apically; valves broad, truncate terminally; costa concave near base, broadly swollen medially, width of swelling about three-fourths of the width of base of uncus, terminal portion sharply narrowed, twisted; sacculus arm very long and slender, of even width, extending almost to apex of costa, in length equal to combined lengths of tegumen and saccus, terminal portion curving posteriad and beset with numerous, short spines set close together on outer and posterior surface in apical one-fourth of arm, with small apical protuberance beyond spines; base of valve with sclerotized band of varying width, extending from inner portion of costal swelling to broadly sclerotized base of sacculus, swinging sharply outward at junction, the adjacent area finely pitted; anellus connecting sclerotized sacculus bases, extending posteriorly as narrow, median juxta, slightly longer than wide, its surface finely pitted; aedeagus in length about three-fourths of combined lengths of tegumen and

saccus; vesica armed with single, elongate, sclerotized spine, in length about two-thirds of length of aedeagus.

**FEMALE GENITALIA:** Sterigma with more or less circular, well-sclerotized lamella postvaginalis, bordered anteriorly by one broad, transverse, sclerotized band, rarely two narrower bands, and laterally by a few irregular folds; ductus bursae well sclerotized, with broad posterior margin, as wide as lamella postvaginalis, posteriorly with gently sloping sides, then sharply narrowed to less than one-half of width of posterior margin; corpus bursae with lightly sclerotized, longitudinally striated neck, in length shorter than length of apophyses posteriores, terminal portion of bursae membranous, elongate, rounded; signum prominent, transverse, with inward-pointing median ridge. Intersegmental membrane between segments  $A_7$  and  $A_8$  convoluted laterally; anterior margin of  $A_8$  with lateral, sclerotized ridge.

**EARLY STAGES:** Unknown.

**FOOD PLANT:** Unknown.

**TYPES:** The specimen bearing the type label of *interruptaria* is a species of group I. This is a female in the collection of the United States National Museum and bears their type number 34267. Even a casual reading of the original description of *interruptaria* shows that it cannot be applicable to the specimen bearing the type label, as the maculation must have two separate loops, a characteristic of this section of group IV and not found in specimens of group I. Accordingly, the true type of *interruptaria* is considered to be lost or mislabeled. The author is continuing the concept of *interruptaria* as given by Grossbeck, the first reviser of this group.

Of *jemezata*, holotype, male, and allotype, female, in the Museum of Comparative Zoölogy at Harvard College, bearing their type number 16845. Not all of the paratypes of *jemezata* are conspecific.

**TYPE LOCALITIES:** Arizona (*interruptaria*); Jemez Springs, Sandoval County, New Mexico (*jemezata*).

**RANGE:** New Mexico Arizona, eastern California, Utah, Colorado, and Wyoming. (See fig. 26.) On the wing from mid April through September.

**REMARKS:** One hundred and twenty-six

specimens and 37 genitalic preparations were studied. This species is the first of several that have the t. a. and t. p. lines forming loops, rather than extending completely across the wing. It can generally be recognized by its smaller size, the more or less even, non-striated appearance of the wings, plus the narrow, black, clearly defined looping lines. Older specimens tend to fade to a brownish color, while recently caught examples are usually more of a gray or dark gray. Examples that fly in the spring are larger and tend to have the cross lines less distinct than do those moths taken later in the year.

The male genitalia are distinctive in having a very long, slender sacculus arm; this character separates the species of the first part of group IV from all the preceding groups. The length of the arm is diagnostic for *interruptaria*, together with the slight terminal curving, which will separate this species from those that follow. The female genitalia are also distinct from those found in the preceding groups, and can be immediately separated by the transverse, ridged signum. On a specific level, the round lamella postvaginalis with the single, broad, transverse band anteriorly, and the wide, short ductus bursae are characteristic.

***Glaucina interruptaria alboceptata* (Dyar),  
new combination**

Plate 25, figure 5; text figure 26

*Coenocharis elongata* HULST, 1896, Trans. Amer. Ent. Soc., vol. 23, p. 353 (*partim*).

*Coenocharis alboceptata* DYAR, 1915, Insec. Inscit. Mens., vol. 3, p. 82.

**MALE:** Head as in nominate *interruptaria*; antennae of about 41 or 42 segments. Thorax and abdomen as in *interruptaria*, or tending to be lighter in color.

**UPPER SURFACE OF WINGS:** Forewings, ground color varying from white or grayish white to dark gray, more or less overlain with grayish brown and brown scales; t. a. line obsolescent, course apparently as in *interruptaria*, making a loop with t. p. line but with the latter arising on costa about three-fourths of distance from base; lower loop tending to be rather short, broad, usually touching upper loop; areas enclosed by two loops of ground color, not darkened; area distad of t. p. line of ground color or, in some

specimens, narrowly light gray; s. t. line faint, light gray, in some indicated by gray or grayish brown band basad of line; terminal line narrow, brownish black, complete or, in some, absent; fringe concolorous with wing. Hind wings pale grayish white or pale grayish brown, as in nominate subspecies.

**UNDER SURFACE OF WINGS:** As in *interruptaria*.

**LENGTH OF FOREWING:** 12 to 17 mm.

**FEMALE:** Similar to male, or tending to have the forewing less heavily suffused with dark scales.

**LENGTH OF FOREWING:** 11 to 14 mm.

**MALE GENITALIA:** Very similar to those of *interruptaria*.

**FEMALE GENITALIA:** Similar to those of *interruptaria*; lamella postvaginalis bordered anteriorly by a single, broad, transverse, sclerotized band.

**EARLY STAGES:** Unknown.

**FOOD PLANT:** Unknown.

**TYPES:** A single female in the collection of the United States National Museum bears a Hulst type label for *elongata*, but it is referable to this subspecies.

Dyar described this species from one male and nine female cotypes, without designating a holotype. The single male is hereby designated as the lectotype, it being in the collection of the United States National Museum and bearing type number 19547, and having the male genitalia on slide no. 765, November 12, 1936, J.F.G.C. Not all the female cotypes are conspecific, as at least one belongs to *imperdata* Dyar.

**TYPE LOCALITY:** Sabinal, Uvalde County, Texas.

**RANGE:** Western and central Texas. (See fig. 26.) On the wing in January, March, April, May, July, August, and September.

**REMARKS:** Twenty-five specimens and 10 genitalic preparations were examined. This is a moth about the size of *interruptaria*, but specimens from the early part of the year are larger than those caught in late spring and early summer. In *alboceptata* the maculation tends to be rather weakly represented, with the two loops usually meeting in the cubital cell, while in the nominate subspecies the maculation is usually distinct and the loops are nearly always separated by 0.5 to 1.0 mm.

There appears to be quite a bit of difference



FIG. 26. Distribution of *Glaucina interruptaria* (Grote).

in the ground color of the upper surface of the wings. In the specimens of Dyar's type series the color ranges from an almost white to gray; all these examples were caught between 1906 and 1910. Four specimens caught in 1950 and 1952, on the other hand, vary in color from gray to dark gray. It may be that this difference is due, at least in part, to the age of the earlier specimens, as they seem to have a tendency to fade. As a result, the color of the forewings should not be relied on as a diagnostic character.

***Glaucina spaldingata* (Cassino and Swett),  
new combination**

Plate 25, figures 6, 7; text figures 27, 55, 87

*Coenocharis interruptaria*, GROSSBECK (*nec* Grote), 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 392, fig. 8 (male genitalia) (*partim*).

*Coenocharis spaldingata* CASSINO AND SWETT, 1923, Lepidopterist, vol. 4, p. 6.

MALE: Head as in *interruptaria*, with antennal bases tending to be white; antennae with from 40 to 42 segments. Thorax and abdomen as in *interruptaria*.



UPPER SURFACE OF WINGS: Forewings, ground color light gray, heavily overlain with dark gray, gray-brown, and brownish black scales, producing a minutely speckled, grayish brown appearance; t. a. line brownish black, diffuse, arising on costa approximately one-fifth or one-fourth of distance from base, as in *interruptaria*, making a loop with t. p. line, but with outward-projecting teeth on veins more attenuated, the course of t. p. line parallel with outer margin; lower loop brownish black, somewhat diffuse, course as in *interruptaria*; areas enclosed by two loops suffused with darker scales, slightly darker than remainder of wing; area distad of t. p. line narrowly light gray; outer portion of wings broadly suffused with dark scales, with s. t. line more or less complete, crenulated, indicated mainly by a brownish gray band basad of line, the band in some specimens partially broken into spots; terminal line and fringe as in *interruptaria*. Hind wings pale grayish brown, as in *interruptaria*.

UNDER SURFACE OF WINGS: As in *interruptaria*, or slightly more suffused with brownish scales.

LENGTH OF FOREWING: 14 to 20 mm.

FEMALE: Similar to male.

LENGTH OF FOREWING: 13 to 18 mm.

MALE GENITALIA: Similar to those of *interruptaria*; uncus with width of base less than length of uncus; valves broad, outer angle rounded; costa with median swelling extending to include narrow terminal portion; sacculus arm straight, long and slender, gradually enlarging in width distally, extending about six-sevenths of length of costa, to beyond median swelling, in length about four-fifths of combined lengths of tegumen and saccus, in width narrower than aedeagus, terminal one-fourth of arm thickly beset with numerous short spines set closely together on outer surface, with very small apical protuberance beyond spines; base of valve with narrow sclerotized band, anterior portion curving distally and swinging sharply outward at junction with broadly sclerotized base of sacculus; juxta as long as wide, with median constriction; aedeagus in length about four-fifths of combined lengths of tegumen and saccus; vesica with spine as in *interruptaria*, rather broad, in length about three-fifths of length of aedeagus.

FEMALE GENITALIA: Similar to those of *interruptaria*; lamella postvaginalis round or slightly elliptical, anterior margin with three or four narrow, transverse, sclerotized bands; ductus bursae subtriangular, posterior margin broader than lamella postvaginalis, the sides tapering. Intersegmental membrane between segments A<sub>7</sub> and A<sub>8</sub> convoluted laterally; anterior margin of A<sub>8</sub> with lateral, sclerotized ridge, narrowing and continued across ventrum of abdomen.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPES: Holotype, male, and allotype, female, in the Museum of Comparative Zoölogy at Harvard College, and bearing their type number 16846.

TYPE LOCALITY: Eureka, Juab County, Utah.

RANGE: The Great Basin Desert area of Utah, Colorado, Nevada, eastern Oregon, and southeastern Washington. (See fig. 27.) On the wing from May through August.

REMARKS: Ninety-seven specimens and 22 genitalic dissections were studied. This species is similar in appearance to *interruptaria*, as it has the same type of maculation. However, *spaldingata* is a larger moth than the preceding, with a more granular or speckled appearance, with the looping lines much less clearly defined, and with the areas enclosed by these lines tending to be slightly darker than the surrounding areas. Spring specimens are quite large, and the wings are fairly uniform in coloration, while moths caught in the summer are smaller and tend to be more contrastingly colored and have better-defined looping lines. It is in these latter that the darkened subterminal area is best developed, and this is a good way to separate these smaller specimens from large examples of *interruptaria*.

In the male genitalia *spaldingata* can be separated from *interruptaria* by the shorter sacculus arms. In the present species they are straight and tapering, rather than of even width and with the apex curved, as in *interruptaria*. Additional characteristics of *spaldingata* are the narrower uncus, the more attenuated costal swelling of the valves, and the slightly longer aedeagus. The female genitalia can be distinguished by the several transverse bands at the anterior part of the



FIG. 27. Distribution of *Glaucina spaldingata* (Cassino and Swett) and *gonia*, new species.

lamella postvaginalis, and by the longer, subtriangular ductus bursae.

***Glaucina gonia gonia*, new species**

Plate 25, figures 8, 9; text figures 27, 56, 88

**MALE:** Head as in *interruptaria*; dorso-lateral areas swollen, angled medially, well separated dorsally, extending ventrally almost to lower margin of front, central area flat except for small swelling medially near lower margin; antennae with from 40 to 43 segments. Thorax above light gray or grayish brown, with scattered gray-black scales and hair-like scales, the former white-tipped; below pale gray; legs grayish brown, with

darker tibiae, the segments very narrowly bordered with white. Abdomen grayish brown, paler at base, with variable amounts of dark scaling, the latter forming an indistinct, double, dorsal line, strongest on posterior margins of segments.

**UPPER SURFACE OF WINGS:** Forewings, ground color light gray, heavily overlain with dark gray, gray-brown, and brownish black scales, producing a minutely speckled, grayish brown appearance, as in *spaldingata*; t. a. line black, usually rather indistinct in basal part of wing, course as in *spaldingata*, making a loop with t. p. line; lower loop black, usually distinct, course as in *spaldingata*,

sometimes slightly more elongated, with space between loops normally about 1 mm., rarely touching; areas enclosed by two loops slightly suffused with darker scales; discal dash normally absent, present in some specimens; area distad of t. p. line narrowly light gray; s. t. line varying from absent to complete, crenulated when present, indicated by grayish brown band basad of line; terminal line narrow, black, complete; fringe slightly checkered opposite veins. Hind wings pale grayish brown, as in *spaldingata*.

UNDER SURFACE OF WINGS: As in *spaldingata*.

LENGTH OF FOREWING: 16 to 21 mm.; holotype, 18 mm.

FEMALE: Like male, or tending to have the forewing slightly less heavily suffused with dark scales, the maculation slightly better defined as a result.

LENGTH OF FOREWING: 18 to 19 mm.; allotype, 19 mm.

MALE GENITALIA: Similar to those of *interruptaria*; uncus with width of base subequal to length of uncus; valves broad, outer angle broadly rounded; costa as in *spaldingata* but with median swelling wider, almost as wide as base of uncus; sacculus arm straight, rather short and broad, extending just beyond one-half of the length of costa, not reaching broadest part of median swelling, in length about seven-tenths of combined lengths of tegumen and saccus, in width equal to width of aedeagus, approximately the terminal one-third of arm usually thickly beset with numerous short spines set close together, extending farther basad on posterior surface than on outer, with small apical protuberance beyond spines; base of valve with narrow sclerotized band, slightly widened distally at junction with broadly sclerotized base of sacculus; juxta slightly longer than wide, with slight median constriction; aedeagus in length about four-fifths of combined lengths of tegumen and saccus; vesica with spine as in *interruptaria*, varying in length from about three-fifths to one-fourth of length of aedeagus.

FEMALE GENITALIA: Similar to those of *interruptaria*; lamella postvaginalis slightly elliptical or ovate, anterior margin with two or three poorly defined, transverse bands, not separated from ostial plate; ductus bursae

almost rectangular, posterior margin slightly broader than lamella postvaginalis, the sides subparallel, sharply angled to rather broad junction with corpus bursae, width of junction more than one-half of the width of posterior margin of ductus bursae. Intersegmental membrane between segments  $A_7$  and  $A_8$  finely convoluted laterally; anterior margin of  $A_8$  with lateral, sclerotized ridge, narrowly continued across ventrum of abdomen.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPES: Holotype, male, Upper Santa Ana River, San Bernardino County, California, June 19, 1948 (G. H. and J. L. Sperry); allotype, female, same data, June 24, 1948. Paratypes, 47 males and eight females, same data as types, various dates between May 9 and August 1, 1946–1949; 33 males and one female, Barton Flats, San Bernardino County, California, various dates between June 1 and July 4, 1946 (G. H. and J. L. Sperry); one male and one female, Phelan, San Bernardino County, California, March 30, 1934, April 4, 1933; one male, Deep Creek Public Camp, San Bernardino County, California, June 15, 1937 (Menke and Stange); six males, Baldy Mesa, San Bernardino County, California, April 9, 1937 (J. A. Comstock); two males, Bear Lake, San Bernardino County, California, June 16, 1917; one male, Palm Springs, Riverside County, California, February 8, 1951 (A. H. Rindge); one male, Pinyon Flats, Santa Rosa Mountains, Riverside County, California, April 23, 1951 (C. D. MacNeill); one male, Indian Wells, Riverside County, California, February 16, 1930; one male, near Hidden Valley, Joshua Tree National Monument, Riverside County, California, March 22, 1948, elevation 4300 feet (C. I. Smith); two males, Glendale, Los Angeles County, California, March, 1950, and May 11, 1950 (C. Hill); two males, Acton Junction, Mint Canyon, Los Angeles County, California, February 8, 1947; two males and one female, Mint Canyon, Los Angeles County, California, February 14, 1953 (C. W. Kirkwood), "3-2-46"; one male, Mt. Wilson, Los Angeles County, California, August 1, 1918 (E. Piazza); 11 males, Sheep Creek, San Gabriel Mountains, Los Angeles County, California, April 12–14, 1933; three males, Little Rock, Mojave Desert, Los Angeles

County, California, April 23, 1935 (J. A. Comstock, L. M. Martin); two males, Valermo, Los Angeles County, California, April 17, 1938 (D. Meadows); two males and one female, Smoky Valley, Tulare County, California, June 11, 1945 (C. Hill), June 18, 1951, and July 1, 1952 (C. Ingham); one male, Argus Mountains, California, May 14, 1935 (G. H. and J. L. Sperry); one male, near Little Lake, California, April 13, 1933. Holotype and allotype in the collection of the American Museum of Natural History; paratypes in the collection of that institution, of the United States National Museum, of the Los Angeles County Museum, of the Museum of Comparative Zoölogy at Harvard College, of the British Museum (Natural History), of the Department of Entomology and Parasitology, University of California, Berkeley, and of C. W. Kirkwood.

**RANGE:** Typically from the San Bernardino and San Gabriel Mountains of southern California, but extending out into the adjacent semi-arid regions, and in the southern Sierra Nevada and Argus Mountains. (See fig. 27.) On the wing from February through August, with specimens from the lower elevations being taken from February through May, and those from the higher places on the wing from May through August. There are also two males and one female, labeled Miami, Arizona, March 19, 25, 26, 1947 (L. H. Bridwell), *ex* collection of G. H. and J. L. Sperry, that apparently belong here.

**REMARKS:** One hundred and thirty-five specimens and 27 genitalic preparations were studied. In general appearance this moth is very similar to *spaldingata*, although it is a larger species. The forewings tend to be of a more even gray color than do the wings of *spaldingata*, and the maculation is not quite so distinct. There is also less dark suffusion in the subterminal area of *gonia*. Another difference is found in the dorsolateral areas of the front, as they are angled medially and they tend to have the inner surface not so steep as in *spaldingata*, and the central area is flatter than in that species. The tegulae of *gonia* contain more hair-like scales than do those of the preceding species.

The male genitalia of *gonia* show a progressive shortening and broadening of the sacculus arm, with a basal extension of the

terminal spined area. The latter is more variable than in the preceding species; usually the spines are numerous and close together, but occasional specimens have a reduced number of larger spines, separated by the width of their diameters. There is also more variability in the nature of the cornutus; normally it is long and thin, but sometimes it is reduced. This latter is usually associated with the reduced spining on the sacculus arm, and these are often specimens from lower, more arid localities. However, these characters and locations are not always correlated, so it is doubtful if they are of specific importance.

The female genitalia are separable by the elliptical or ovate lamella postvaginalis, with the poorly defined transverse bands not being separated from the plate. Another distinguishing character is found in the virtually rectangular ductus bursae.

***Glaucina gonia microgonia*, new subspecies**

Plate 25, figures 10, 11; text figure 27

**MALE:** Head as in nominate *gonia*. Thorax and abdomen similar to those of *gonia*, but paler, thorax above light gray or white, with scattered dark scales, the abdomen pale gray, with darker scaling.

**UPPER SURFACE OF WINGS:** Forewings, ground color white, heavily overlain with gray-brown and brownish black scales, producing a contrasting, minutely speckled appearance; maculation as in *gonia*, but tending to be slightly more diffuse owing to heavier suffusion of dark scales; subterminal area heavily overlain with brownish black scales, producing a dark band. Hind wings pale gray, as in *gonia*.

**UNDER SURFACE OF WINGS:** All wings pale gray, forewings less suffused with gray than in *gonia*.

**LENGTH OF FOREWING:** 14 to 16 mm.; holotype, 16 mm.

**FEMALE:** Like male, with upper surface of forewings less heavily suffused with dark scales, the maculation being better defined as a result.

**LENGTH OF FOREWING:** 13 to 15 mm.; allotype, 15 mm.

**MALE GENITALIA:** As in nominate *gonia*.

**FEMALE GENITALIA:** As in nominate *gonia*.

**EARLY STAGES:** Unknown.

**FOOD PLANT:** Unknown.

**TYPES:** Holotype, male, Independence, Inyo County, California, April 21, 1933 (J. A. Comstock); allotype, female, same data, May 14, 1936 (L. M. Martin). Paratypes, three males and 14 females, same data as types, May 14, 1936, June 13, 1936 (J. A. Comstock and L. M. Martin); one female, Round Valley, Inyo County, California, August 4-8, 1929 (J. A. Comstock); one female, Coleville, Mono County, California, July 23, 1948 (R. Coleman). Holotype and allotype in the collection of the Los Angeles County Museum; paratypes in the collections of that institution, of the American Museum of Natural History, and of the United States National Museum.

**RANGE:** Eastern California. (See fig. 27.) On the wing from mid April to early August.

**REMARKS:** Twenty-one specimens and eight genitalic dissections were studied. There is more difference in appearance and size between this subspecies and nominate *gonia* than there is between most of the other species in this complex. However, the structure of the front, the type of maculation, and the genitalia of both sexes are virtually identical in the two populations, hence they are placed as subspecies. In *microgonia*, the length of the forewings in both sexes is about 3 mm. shorter than in *gonia*, and the wings are much paler and more contrasting in color.

This population might be confused with *spaldingata* Cassino and Swett, especially the specimens that fly in the summer months. Both are rather small and have wings with a minutely speckled appearance. *Microgonia* has lighter-colored wings, and the maculation is slightly more clearly represented, but the safest way to differentiate the two is by the genitalia.

#### *Glaucina platia*, new species

Plate 25, figures 12, 13; text figures 28, 57, 89

*Tornos interruptaria*, RINDGE (*nec* Grote), 1955, Bull. Amer. Mus. Nat. Hist., vol. 106, p. 146.

**MALE:** Head as in *gonia*; antennae of 40 to 42 segments. Thorax and abdomen as in *gonia*, or tending to be even lighter in color.

**UPPER SURFACE OF WINGS:** Forewings, ground color white or light gray, heavily overlain with dark gray, gray-brown, and brownish black scales, producing a minutely speckled, light gray (spring generation) or

grayish brown (summer generation) appearance; t. a. line brownish black, usually rather indistinct in basal part of wing, course as in *spaldingata*, making a loop with t. p. line, the latter with elongate extensions on veins; lower loop brownish black, distinct, course as in *spaldingata* but slightly more elongate, with space between loops normally about 1 mm., but in some specimens touching; areas enclosed by two loops slightly suffused with darker scales, or with lower loop concolorous with wing; discal dash usually absent; area distad of t. p. line narrowly light gray; s. t. line usually absent or very weak, in some specimens indicated by grayish brown band basad of line; terminal line narrow, black, complete, with small, cellular dots; fringe concolorous with wing, slightly checkered opposite veins. Hind wings pale grayish brown, as in *spaldingata*.

**UNDER SURFACE OF WINGS:** As in *spaldingata*.

**LENGTH OF FOREWING:** 16 to 20 mm.; holotype, 18 mm.

**FEMALE:** Like male, or tending to have the forewing less heavily suffused with dark scales, the maculation being slightly better defined as a result.

**LENGTH OF FOREWING:** 15 to 17 mm.; allotype, 16 mm.

**MALE GENITALIA:** Similar to those of *interruptaria*; uncus with width of base subequal to length of uncus; valves broad, outer angle broadly rounded; costa as in *interruptaria*; sacculus arm straight, short, and broad, barely extending to one-half of the length of costa, not reaching broadest part of median swelling, in length about three-fifths of combined lengths of tegumen and saccus, in width equal to width of aedeagus, with approximately the terminal one-third to two-fifths of arm beset with many heavy spines on outer surface, usually separated by their own diameter or more, with small apical protuberance beyond spines; base of valve with narrow sclerotized band, widened distally at junction with broadly sclerotized base of sacculus; juxta widest anteriorly, with slight median constriction; aedeagus in length about four-fifths of combined lengths of tegumen and saccus; vesica as in *interruptaria*, with length of spine about two-thirds of length of aedeagus.

**FEMALE GENITALIA:** Similar to those of *interruptaria*; lamella postvaginalis rounded, anterior margin with two or three narrow, transverse, sclerotized bands; ductus bursae subtriangular, posterior margin slightly wider than lamella postvaginalis, the sides tapering; corpus bursae with more or less tapering sides, neck and body hardly separable. Intersegmental membrane between segments A<sub>7</sub> and A<sub>8</sub> finely convoluted laterally; anterior margin of A<sub>8</sub> broadly sclerotized laterally, sharply narrowed and continued across ventrum of abdomen.

**EARLY STAGES:** Unknown.

**FOOD PLANT:** Unknown.

**TYPES:** Holotype, male, Inyo Mountains, Inyo County, California, May 11, 1936, elevation 9000 feet (R. H. Andrews and L. M. Martin); allotype, female, Independence, Inyo County, California, June 13, 1936 (J. A. Comstock). Paratypes, eight males, same data as holotype; one male, same data as holotype, May 28, 1937 (M. Walton); two males and three females, Argus Mountains, Inyo County, California, May 13, 1935, May 9, 1936, May 27, 1937 (L. M. Martin); one male and three females, near Topaz, Mono County, California, July 15, 1937; one male, Silver Lake, Mono County, California, June 4, 1950 (C. W. Kirkwood); one male, Mammoth, Mono County, California, July 17, 1936 (C. W. Kirkwood); one female, Ivanpah Mountains, San Bernardino County, California, April 29, 1935 (J. A. Comstock); two females, Havilah, California (Stretch), one labeled "*Tornos interruptaria* Grote, Type," and "*Eup. behrensata* Pack." (the latter label apparently by Grote), both specimens originally from the Henry Edwards and G. D. Hulst collections; one female, 2 miles north of Pinyon Flats, Palms to Pines Highway, Riverside County, California, "9-1-46" (presumably September 1, 1946); one female, Verdi, Nevada (A. H. Vachell); one male, Railroad Canyon, White Pine County, Nevada, June 29, 1934 (G. H. and J. L. Sperry); one female, Pueblo Mountains, Harney County, Oregon, May 22, 1950 (J. H. Baker); one male, St. George, Washington County, Utah, July 27, 1916. Holotype and allotype in the collection of the Los Angeles County Museum; paratypes in the collection of that institution, of the American Museum

of Natural History, of the United States National Museum, of the Museum of Comparative Zoölogy at Harvard College, and of C. W. Kirkwood.

**RANGE:** Eastern California, extending into the San Jacinto Mountains in the south, Nevada, southwestern Utah, and southeastern Oregon. (See fig. 28.) On the wing in April, May, June, July, and September.

**REMARKS:** Thirty-one specimens and 12 genitalic preparations were examined. This species is allied to *gonia* but can be separated from that species by the lighter gray of the forewings, which also tend to have a more brownish suffusion than do those of *gonia*. In addition, the pattern of the primaries is perhaps better defined than in *gonia*. This species has broad, triangular forewings, with a relatively well-defined anal angle; this character is also diagnostic. Both *platia* and *gonia microgonia* fly in the same area and at the same time in eastern California. The present species is larger and of a more uniform gray color than is *microgonia*; good genitalic differences are present also. Both *platia* and *interruptaria* fly together in eastern San Bernardino County, California. These are even more difficult to separate by color and maculation; the genitalia should be examined to make the determination.

There is some apparent seasonal dimorphism, as specimens caught in May and June tend to be larger and to have less dark scaling on the forewings above than do specimens caught in the same area during July.

This species shows a continuation in the trend for a shorter and broader sacculus arm in the male genitalia, with a reduction in the density of the spining. The arm is relatively shorter and broader than that found in *gonia*, and the spining is more widely spaced, even in those examples of the latter that have the reduced spination. The female genitalia are very similar to those of *spaldingata*, but the lamella postvaginalis in the present species tends to have the transverse bands more widely separated, hence they appear to be more distinct. There is less of a demarcation between the neck and the body of the corpus bursae in *platia*, and the sclerotized strip across the ventrum on A<sub>8</sub> is more sharply narrowed than in *spaldingata*.

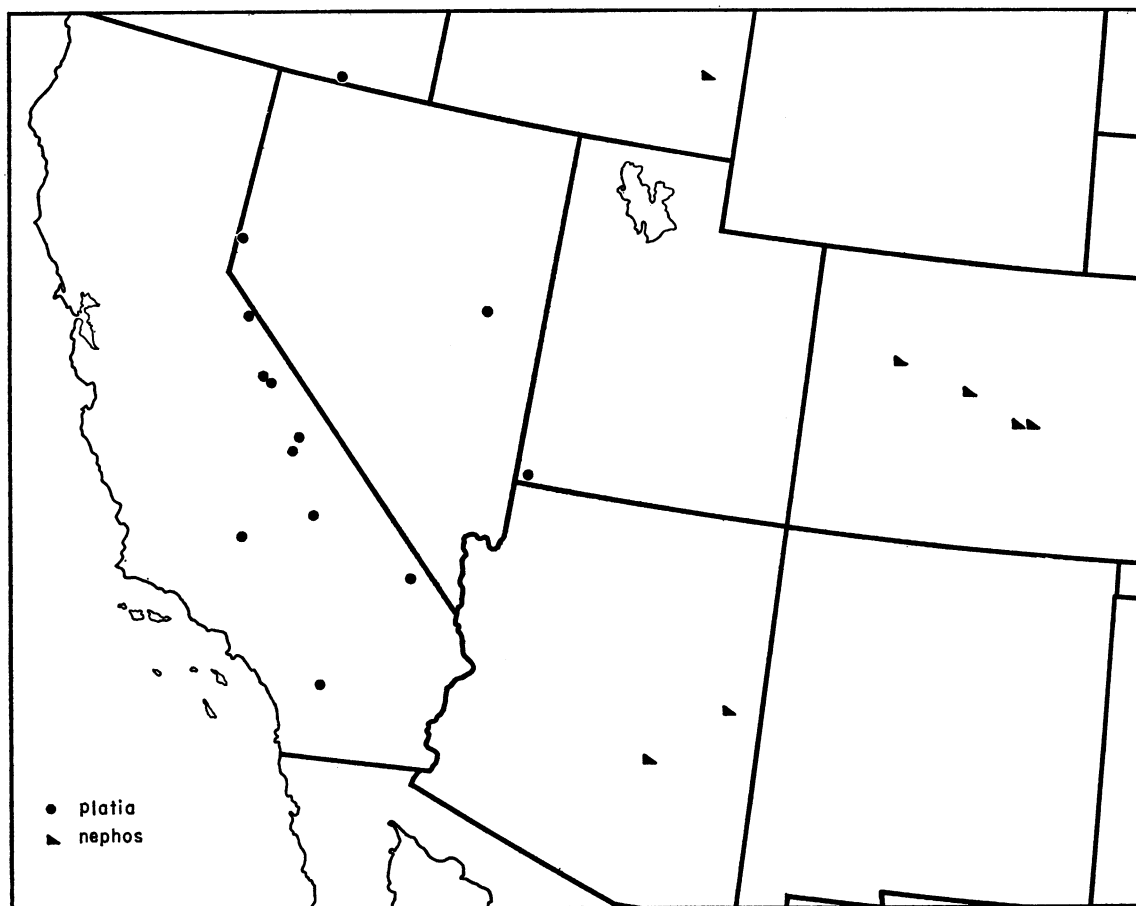


FIG. 28. Distribution of *Glaucina platia*, new species, and *nephos*, new species.

***Glaucina nephos*, new species**

Plate 25, figure 14; text figures 28, 58

MALE: Head as in *gonia*; antennae of 36 to 41 segments. Thorax and abdomen as in *gonia*, or tending to be slightly darker.

UPPER SURFACE OF WINGS: Forewings, ground color dull gray, overlain with grayish brown and brown scales, producing a faintly speckled dark gray or grayish brown appearance; t. a. line weak, indistinct in basal part of wing, course as in *spaldingata*, making a loop with t. p. line; lower loop faint or distinct, course as in *spaldingata* but slightly more elongate and thinner, with the two loops touching in cubital cell or separate; areas enclosed by two loops slightly suffused with darker scales; area distad of t. p. line narrowly light gray; s. t. line faint, light gray, in some specimens indicated by dark gray or grayish brown band basad of line; terminal

line narrow, brownish black, complete; fringe dark gray. Hind wings pale grayish brown, as in *spaldingata*.

UNDER SURFACE OF WINGS: As in *spaldingata*.

LENGTH OF FOREWING: 14 to 18 mm.; holotype, 15 mm.

FEMALE: Unknown.

MALE GENITALIA: Similar to those of *interruptaria*; uncus with width of base usually narrower than length of uncus; valves broad, outer angle broadly rounded; costa as in *spaldingata*; sacculus arm relatively short and broad, extending about two-thirds of the length of costa, extending to broadest part of median swelling or slightly short thereof, in length about three-fifths of combined lengths of tegumen and saccus, in width subequal to width of aedeagus, with approximately the terminal two-fifths of arm thickly beset with



numerous short spines set closely together on outer surface, with small apical protuberance beyond spines; base of valves with narrow sclerotized band, curving and widening distally at junction with broadly sclerotized base of sacculus; juxta square, in some specimens with very slight median constriction; aedeagus in length about four-fifths of combined lengths of tegumen and saccus; vesica as in *interruptaria*, with length of spine about three-fifths to seven-tenths of length of aedeagus.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPES: Holotype, male, Rock Creek Canyon, El Paso County, Colorado, June 15, 1957 (M. May). Paratypes, six males, same data as holotype, May 27–June 7, 1957, August 22, 1957; one male, Fountain Valley, near Colorado Springs, El Paso County, Colorado, May 13, 1948, elevation 5800 feet (F. M. Brown); two males, Glenwood Springs, Garfield County, Colorado, July 16–23; one male, Alma, Park County, Colorado, July; one male, "Col.," labeled "*Lepiodes interruptaria* Grt., typical" by Hulst; one male, Blackfoot, Bingham County, Idaho, June 2; one male, Vernon, Apache County, Arizona, July, 1936; two males, Miami, Gila County, Arizona, March 19, 26, 1947 (L. H. Bridwell). Holotype and paratypes in the collection of the American Museum of Natural History; paratypes in the collections of the United States National Museum, of the Museum of Comparative Zoölogy at Harvard College, and of C. P. Kimball.

RANGE: Arizona, Colorado, and north to Idaho. (See fig. 28.) On the wing in March, May, June, July, and August.

REMARKS: Sixteen specimens and nine genitalic dissections were studied. This species is allied to *gonia* and *platia* in the structure of the front, but it is smaller than either of these species. The upper surface of the forewings tends to be grayer than those of *platia*, and to have less brown suffusion. Another diagnostic character is that the loops of the t. a. and t. p. lines tend to meet, although with so few specimens at hand it cannot be stated accurately just how often this occurs.

The male genitalia show a close relationship to the corresponding structures of *gonia*.

In *nephos* the sacculus arm tends to be slightly longer and broader, and the spining is not quite so dense as in *gonia*. The juxta tends to be square in the present species, as compared with the slightly rectangular or slightly tapered shape of that of *gonia*.

***Glaucina infumataria* (Grote),  
new combination**

Plate 25, figures 15, 16; text figures 59, 90

*Tornos infumataria* GROTE, 1877, Canadian Ent., vol. 9, p. 90.

*Lepiodes infumataria*, HULST, 1887, Ent. Amer., vol. 3, p. 11 (placed as synonym of *Lepiodes approximaria* Packard = *Exelis pyrolaria* Guenée). J. B. SMITH, 1891, List of the Lepidoptera of boreal America, p. 71.

*Exelis infumataria*, DYAR, "1902" [1903], Bull. U. S. Natl. Mus., no. 52, p. 323. GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 406.

*Coenocharis infumataria*, BARNES AND McDUNNOUGH, 1914, Contributions to the natural history of the Lepidoptera of North America, vol. 2, p. 210 (removed from synonymy and given specific status).

MALE: Head, vertex and front grayish brown, the scales with narrow, light gray tips, front broad, with dorsolateral areas slightly swollen, widely separated, with slight indication laterally of median transverse ridge, central area flat; palpi long, extending beyond eyes about one-half of the length of eyes, with mixed gray and brown scales. Thorax above dark gray or grayish brown, the scales with narrow, light gray tips; below lighter gray; legs gray, the fore tibia and all tarsi grayish brown, the segments of the latter narrowly bordered distally with light gray. Abdomen grayish brown above and below.

UPPER SURFACE OF WINGS: Forewings, ground color grayish brown, with scattered brown scales, t. a. line faint, brownish gray, indistinct in upper part of wing, apparently not connecting with t. p. line, lower portion of line with outward-pointing teeth in cell Cu and on anal vein; t. p. line arising on costa about three-fourths of distance from base, paralleling outer margin, with strong outward-pointing teeth on veins and in cubital cell, the line faintly shaded distally with gray; outer portion of wing concolorous with basal part, except for pale, faint, s. t. line; terminal line scarcely indicated; fringe

concolorous with wing. Hind wings pale grayish brown; anal margin light gray, heavily suffused with dark scales; maculation absent except for partial post-discal line; terminal line and fringe as on forewings.

UNDER SURFACE OF WINGS: Forewings pale brownish gray, slightly darkened along costa and near apex; hind wings gray, suffused with brown scales; both wings without maculation; fringe as above.

LENGTH OF FOREWING: 17 mm.

FEMALE: Head similar to that of male, but with dorsolateral areas slightly higher and with central area of front slightly swollen.

UPPER SURFACE OF WINGS: Similar to that of wings of male, with t. a. and t. p. lines slightly better defined, owing to darker scaling, and with s. t. line absent.

UNDER SURFACE OF WINGS: As in male.

LENGTH OF FOREWING: 13 mm.

MALE GENITALIA: Uncus with width of base less than length of uncus; valves broad, outer angle bluntly rounded; costa with median swelling extending to include narrow, curved, terminal portion; sacculus arm straight, long and slender, slightly broadened distally, extending about three-fourths of length of costa, to just beyond median swelling, in length slightly more than four-fifths of combined lengths of tegumen and saccus, in width narrower than aedeagus, terminal two-fifths of arm thickly beset with many short spines set closely together on outer surface, with rather broad apical protuberance beyond spines; base of valve with narrow sclerotized band, anterior portion curving distally and swinging shortly outward at junction with broadly sclerotized base of sacculus, posterior portion tapering; juxta longer than wide, with finely pitted surface; aedeagus in length slightly shorter than combined lengths of tegumen and saccus; vesica with short spine, in length about three-tenths of length of aedeagus, with slight median constriction.

FEMALE GENITALIA: Sterigma with lamella postvaginalis rounded but with slight attenuations both anteriorly and posteriorly, anterior margin with six or eight narrow, transverse, sclerotized bands; ductus bursae almost square, in width slightly greater than one-half of width of lamella postvaginalis. Intersegmental membrane between segments

A<sub>7</sub> and A<sub>8</sub> strongly convoluted laterally; anterior margin of A<sub>8</sub> with small, lateral, sclerotized ridge.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPES: Described from two female specimens collected by Belfrage; both are in the collection of the British Museum (Natural History). The specimen dated June 3 is hereby designated as the lectotype.

TYPE LOCALITY: Texas.

RANGE: Known only from Texas. The three known specimens were taken in March and June.

REMARKS: Two specimens and three genitalic dissections were studied. This species is apparently quite rare, and both specimens that were examined were part of the original type lot. Much remains to be known about the variation, flight period, and range, to mention but a few of the problems. In pattern, *infumataria* does not belong in the *interruptaria* group at all, as it does not have the characteristic looping cross lines. In general appearance it is much more reminiscent of *ignavaria* Pearsall from Arizona; in fact, the latter has been listed as a synonym of *infumataria* since 1917. The Texas species can be distinguished from *ignavaria* by its lighter coloration, by the genitalia, and by the distribution.

The male genitalia of *infumataria* are similar to those of *interruptaria* and *spaldingata*, as the sacculus arms are very long. They resemble those of *spaldingata* the most, and can be distinguished from those of that species by the greater area of terminal spining on the sacculus arm and by the much shorter spine in the aedeagus. The female genitalia are separable from those of the preceding species by the small ductus bursae and by the numerous convolutions of the intersegmental membrane.

*Glaucina ignavaria* (Pearsall), new status  
and new combination

Plate 26, figures 1, 2; text figures 29, 60, 91

*Coenocharis ignavaria* PEARSALL, 1906, Sci. Bull. Brooklyn Inst. Arts Sci., vol. 1, p. 216. GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 396. BARNES AND McDUNNOUGH, 1917, Check list of the Lepidoptera of boreal America, p. 117 (synonym of *infumataria* Grote).

**MALE:** Head, vertex and front blackish brown or dark brownish gray, the scales with narrow, light gray tips, with front tending to be slightly lighter in color; front broad, dorso-lateral areas divergent, inner margins concave, moderately high, central area bulging across center; palpi lengthy, extending beyond eyes about the length of eyes, with mixed light gray, brownish gray, and blackish brown scales, usually with narrow, light gray tips; antennae of from 42 to 47 segments. Thorax above dark gray or grayish black, the scales with narrow, light gray tips; below lighter gray; legs gray or grayish brown, the fore tibia and all tarsi grayish black, the segments of the latter often narrowly bordered distally with light gray. Abdomen grayish brown above and below, with variable amounts of darker scaling, the latter in some specimens forming an indistinct, double, dorsal line.

**UPPER SURFACE OF WINGS:** Forewings similar to those of *infumataria*, ground color gray or grayish brown, heavily overlain with dark grayish brown, brown and blackish brown scales, producing a dark gray or brownish gray color; t. a. line indistinct, incomplete, apparently arising on costa about one-fourth of distance from base, projecting into cell, turning posteriad and subparalleling outer margin, going more or less straight to inner margin, appearing most prominently in lower portion of wing, usually thickened in fold and above inner margin, in some specimens with faint, light gray basal shading; discal dot absent; t. p. line more or less complete, blackish brown, with narrow, light gray distal shade line, arising on costa about three-fourths of distance from base, subparalleling outer margin, extending outward and often emphasized on veins and in fold, in some specimens with faint line extending across fold to t. a. line; subterminal and terminal areas concolorous with remainder of wing; s. t. line usually faint or absent, when present appearing as light gray cellular spots; terminal line dark gray or black, narrow, usually with small intravenular spots; fringe concolorous with wing. Hing wings virtually concolorous with forewings, slightly less heavily suffused with dark scales; anal margin light gray, heavily suffused with brownish black scales; maculation absent except for

post-discal line, prominent above anal angle, extending only part way across wing; terminal line and fringe as on forewing, but without intravenular spots.

**UNDER SURFACE OF WINGS:** Forewings brownish gray, with scattered darker brown scales, especially along costa and near apex; hind wings grayish brown, with scattered brown scales; both wings without maculation except for narrow terminal line.

**LENGTH OF FOREWING:** 14 to 20 mm.

**FEMALE:** Similar to male.

**LENGTH OF FOREWING:** 15 to 19 mm.

**MALE GENITALIA:** Uncus with width of base subequal to length of uncus, lateral margins slightly swollen medially, the apex curved ventrally but not protruding far; gnathos with small, projecting, median enlargement; valves with outer angle broadly rounded; costa slightly concave near base, outer margin not swollen, almost straight, enlarged medially into valve, width of swelling less than width of base of uncus, distal portion tapering into angled terminal protuberance; sacculus arm heavily sclerotized, long and slender, of even width, extending about three-fourths of length of costa, to beyond median costal swelling, in length nine-tenths of combined lengths of tegumen and saccus, in width narrower than aedeagus, apex with a cluster of from five to eight elongate spines, with small, pointed, apical protuberance beyond spines; base of valve with sclerotized band curving outward at junction with broadly sclerotized base of sacculus; anellus connecting sclerotized sacculus bases, juxta extending anteriorly as broadly V-shaped swelling, posteriorly as slightly tapering plate, its surface finely pitted; aedeagus in length about one-tenth longer than combined lengths of tegumen and saccus; vesica armed with a thin, sclerotized strip, slightly S-shaped, becoming thinner and dentate distally, in length slightly less than one-half of length of aedeagus.

**FEMALE GENITALIA:** Sterigma with a large, elliptical, lightly sclerotized lamella postvaginalis, bordered anteriorly and laterally by a number of lightly sclerotized folds, with lamella antevaginalis a small, sclerotized ridge, indented medially; ductus bursae small, sclerotized, rectangular, twice as long as wide; corpus bursae elongate, with lightly

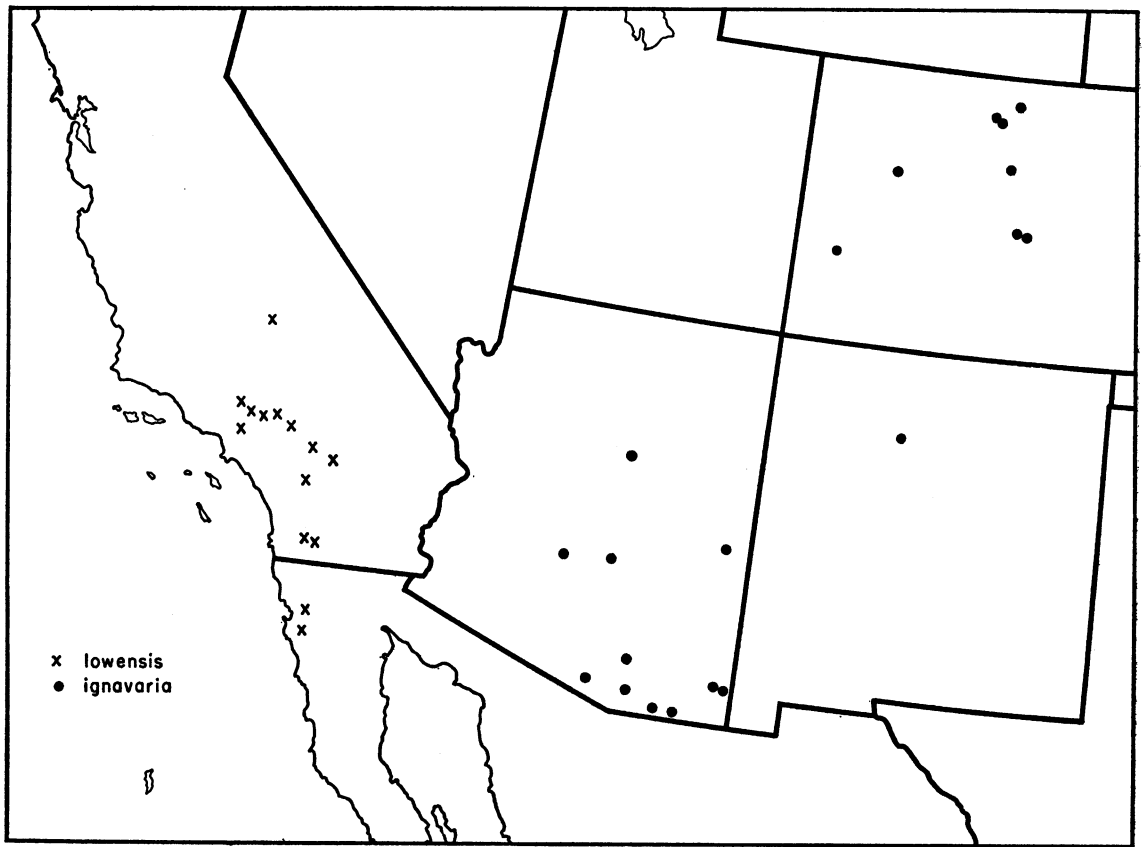


FIG. 29. Distribution of *Glaucina ignavaria* (Pearsall) and *lowensis* (Cassino and Swett).

sclerotized, longitudinally striated neck, gradually enlarging into ovoid, terminal portion of bursae; signum prominent, transverse, with inward-pointing median ridge. Inter-segmental membrane between segments  $A_7$  and  $A_8$  with numerous, more or less circularly arranged convolutions; anterior margin of  $A_8$  with narrow, sclerotized ridge.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPE: Holotype in the collection of the United States National Museum, bearing type number 24268. This species was described from a single male specimen.

TYPE LOCALITY: Palmerlee, Cochise County, Arizona.

RANGE: Arizona, New Mexico, and Colorado. (See fig. 29.) On the wing in April, June, July, August, and early September. A single male labeled Glen Ellen, Sonoma County, California, July 13, 1917, has been examined and found to be conspecific; the data should

be checked before they can be accepted.

REMARKS: One hundred and thirty-five specimens and 24 genitalic preparations were studied. This species and *infumataria* begin a small group of rather large-sized moths with roughly parallel cross lines on the forewings above. Specimens of *ignavaria* from southern Arizona tend to have a somewhat brownish coloration to the forewings, even in freshly caught examples, while specimens from Colorado tend to have a slightly grayer primary.

The male genitalia are characterized by the long, slender, sacculus arm, with the single cluster of spines at the apex. The very long aedeagus separates this species from the preceding ones. The female genitalia can be separated from those of the preceding species by the larger and much more lightly sclerotized lamella postvaginalis, and by the much smaller, rectangular ductus bursae.

*Glaucina spina*, new species

Plate 26, figures 3, 4; text figures 61, 92

MALE: Head, vertex brownish gray, the scales with narrow, light gray tips; front brownish black laterally, medially and ventrally grayish brown, dorsolateral areas slightly swollen, central area faintly swollen; palpi lengthy, extending beyond eyes about length of eyes, with mixed light gray and grayish brown scales; antennae of approximately 42 segments. Thorax above grayish brown, the scales with narrow, light gray tips; below lighter gray; legs grayish brown, the fore tibia and all tarsi brown, the segments of the latter narrowly bordered with light gray distally. Abdomen grayish brown above and below.

UPPER SURFACE OF WINGS: Forewings similar to those of *ignavaria*; ground color grayish brown, overlain with brown scales; t. a. line indistinct, incomplete, apparently as in *ignavaria*; discal dot elongate, dark grayish brown; t. p. line faint, usually complete, with narrow, pale, distal shade line, extending outward on veins, swinging distad opposite cell, then subparalleling outer margin to anal vein, sharply turning basad to meet inner margin; subterminal and terminal areas concolorous, in some individuals slightly darker than remainder of wing; s. t. line absent; terminal line faint, narrow; fringe concolorous with wing. Hind wings pale gray, suffused with brownish gray scales; anal margin light gray, heavily suffused with brownish black scales; maculation absent except for post-discal line above anal angle; terminal line and fringe as on forewings.

UNDER SURFACE OF WINGS: Forewings brownish gray, with scattered darker brown scales, especially along costa and near apex; hind wings light gray, with scattered brown scales; both wings without maculation except for faint discal dots and narrow terminal lines.

LENGTH OF FOREWING: 17 to 18 mm.; holotype, 18 mm.

FEMALE: Similar to male; front with swollen dorsolateral areas narrower and steeper.

LENGTH OF FOREWING: 16 mm.

MALE GENITALIA: Similar to those of *ignavaria*; uncus with width of base less than length of uncus; valves almost without

costal swelling, in width less than width of aedeagus; sacculus arm elongate, slender, of even width, extending about one-half of length of costa, almost to median costal swelling, in length three-fifths of combined lengths of tegumen and saccus, in width about one-half as wide as aedeagus, apex with a cluster of seven or eight elongate spines and with two or three scattered spines basad of cluster, near end, on outer surface, without apical protuberance beyond spines; base of valves with narrow, sclerotized band slightly S-shaped, sharply broadened at junction with broadly sclerotized base of sacculus; aedeagus in length slightly shorter than combined lengths of tegumen and saccus; vesica armed with a thin, straight, sclerotized strip, slightly increasing in width posteriorly, the apex dentate, with a single, long, sclerotized tooth and three or four smaller teeth on the right side.

FEMALE GENITALIA: Similar to those of *ignavaria*; lamella postvaginalis ovate, bordered with one or two small, lightly sclerotized folds, and with a single, continuous, sclerotized ridge extending from lateral margins of segment, curving anteriorly and passing anteriorly to lamella postvaginalis, and with lamella antevaginalis paralleling the above ridge, more prominent medially but not extending so far laterally; ductus bursae very small, sclerotized, slightly longer than wide; corpus bursae long and slender, gradually increasing in width anteriorly.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPES: Holotype, male, San Pedro, Mexico City, Distrito Federal, Mexico, January 15, 1917 (C. C. Hoffmann); allotype, female, Lomas Mixcoac, Santa Fe, Mexico City, Distrito Federal, Mexico, February 5, 1917 (C. C. Hoffmann). Paratypes, one male, San Angel, Mexico City, Distrito Federal, Mexico, June 19, 1913 (C. C. Hoffmann); one male, Mexico City, Mexico, June, 1919 (R. Muller); one male and one female, "Mexico," ex C. C. Hoffmann collection, the male dated January 25, the female Escalante collection. Holotype and allotype in the collection of the American Museum of Natural History; paratypes in the collection of that institution and in the collection of the United States National Museum.

RANGE: Known only from Mexico City. On the wing in January, February, and June.

REMARKS: Six specimens and three genitalic preparations were studied. This species is closely allied to *ignavaria* Pearsall, but can be distinguished by the browner forewings, which have distinct discal dots above and below, and by the much reduced dorsolateral areas of the front. The secondaries are a lighter color, in this species, than are the primaries, and this contrast is another specific character of value.

The genitalia are of the same general nature as those of *ignavaria*, but the male structure is smaller. The sacculus arm does not extend so far up the valve, and the aedeagus is shorter and has a different armature of the vesica than is found in *ignavaria*. The female genitalia have two subparallel ridges on each side of the ostium that are uninterrupted. Another character that separates this species from the preceding is the much shorter ductus bursae.

***Glaucina panda*, new species**

Plate 26, figure 5; text figure 93

MALE: Unknown.

FEMALE: Head, vertex and front brownish gray, the scales with narrow, light gray tips, with front tending to be slightly lighter in color; front with dorsolateral areas slightly swollen, central area flat; palpi with mixed light gray and brown scales; antennae of about 40 or 41 segments. Thorax above gray, the scales with narrow, light gray tips; below lighter gray; legs grayish brown, becoming brown distally. Abdomen grayish brown above and below.

UPPER SURFACE OF WINGS: Forewings similar to those of *ignavaria*; ground color dark gray, with scattered grayish black and blackish brown scales; t. a. line very weak, represented by a single, incomplete line of black scales, making a deep, outward loop in cell and a less pronounced one in the cubital cell, directed basad on cubital and anal veins, the line subparalleling outer margin; discal dot very weakly represented; t. p. line faint, extending outward on veins, apparently slightly slightly concave opposite cell, convex below, rather deeply concave in cubital cell, the line with faint, distal shade line in lower part of

wing; subterminal and terminal areas concolorous, slightly darker than remainder of wing; s. t. line absent, except for a few gray scales above tornus; terminal line dark, narrow; fringe of ground color. Hind wings pale grayish brown, becoming darker distally; anal margin gray, heavily suffused with blackish brown scales; maculation absent except for post-discal line above anal angle; terminal line and fringe as on forewings.

UNDER SURFACE OF WINGS: Forewings brownish gray, with costa slightly darker; hind wings gray, heavily overlain with brownish gray scales; both wings without maculation except for discal dots on forewings and for narrow terminal line.

LENGTH OF FOREWING: Holotype, 14 mm.

FEMALE GENITALIA: Similar to those of *ignavaria*; lamella postvaginalis elliptical, bordered anteriorly and laterally by several lightly sclerotized folds, with a continuous, sclerotized ridge, broadest medially, extending from lateral margins of segment diagonally to midline and passing anteriorly to lamella postvaginalis, and with lamella antevaginalis a prominent, broadly curving ridge from sides of segment; ductus bursae very small, sclerotized, slightly longer than wide; corpus bursae rather small, the neck with slightly diagonal longitudinal striations.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPE: Holotype, female, Actopan, Hidalgo, Mexico, March 20, 1925, ex C. C. Hoffmann collection. This specimen is in the collection of the American Museum of Natural History.

RANGE: Known only from Actopan, Hidalgo, in March.

REMARKS: One specimen and one genitalic preparation were studied. This species is closely allied to the two preceding ones, but can be distinguished by the darker gray forewings, the more strongly curved t. p. line, and the smaller size. The front is also similar, but it is smaller and not so strongly swollen.

The female genitalia are of the same general type as those of the two preceding species, but the conformation of the sclerotized ridges near the ostium is different. The shape of the lamella postvaginalis is similar to that found in *ignavaria*, but it is narrower in the present species.

***Glaucina foeminaria* (Dyar), new combination**

Plate 26, figure 6; text figures 62, 94

*Coenocharis foeminaria* DYAR, 1910, Proc. U. S. Natl. Mus., vol. 38, p. 264.

**MALE:** Head, vertex grayish brown, becoming brownish black between antennal bases; front with mixed dark gray and brownish black scales, and scattered grayish brown scales medially, dorsolateral areas curved, moderately high, dorsal margins separated by one-half of the length of last segment of palpus but connected by a narrow, curving, sclerotized ridge, central area slightly swollen; palpi grayish brown, rather long-scaled below, extending beyond eyes about three-fourths of length of eyes; antennae of about 41 segments. Thorax above grayish brown, the scales with narrow, light gray tips; below lighter gray; legs gray or grayish brown, the fore tibia and all tarsi brown, the segments of the latter narrowly bordered distally with gray. Abdomen grayish brown above and below.

**UPPER SURFACE OF WINGS:** Forewings, ground color gray, heavily overlain with grayish black scales along costa as far as t. p. line, with remainder of wing having scattered brownish black scales, especially in cell; t. a. line apparently absent on costa, appearing as faint, deep sinus in cell, with strong basal bend on cubital vein, outwardly angled in fold, then inwardly directed to inner margin; discal dot indicated by diffuse dark cloud of scales; t. p. line arising on costa three-fourths of distance from base, grayish black, becoming blackish brown opposite cell, outwardly produced on veins, subparalleling outer margin, thickened in fold, the line with light gray, distal shade line filling in cellular concavities; subterminal and terminal areas slightly less suffused with dark scales than basal part of wing; s. t. line a broad, nebulous band of dark gray and brownish black scales; terminal line black, narrow, with small intravenular spots; fringe dark gray. Hind wings pale grayish brown, becoming slightly darker distally; anal margin light gray, suffused with brownish black scales; maculation absent except for post-discal line, prominent along anal margin, fading out in center of wing but indi-

cated by faint gray band distally, extending most of the way across wing; terminal line brownish black at anal angle, fading out along outer margin; fringe as on primaries.

**UNDER SURFACE OF WINGS:** Forewings grayish brown, with costa and apex of wing slightly darker; hind wings light gray, with scattered light brown scales, the veins being light brown also; both wings without maculation.

**LENGTH OF FOREWING:** 15 mm.

**FEMALE:** Similar to male.

**LENGTH OF FOREWING:** 16 mm. .

**MALE GENITALIA:** Similar to those of *ignavaria*; uncus with width of base about two-thirds of the length of uncus; valves with costa concave basally, swollen apically, enlarged anteriorly into valve, the width of swelling subequal to width of base of uncus, located seven-tenths of distance from base of costa; sacculus arm broad, extending about one-half of length of costa, not attaining median costal swelling, in length three-fourths of combined lengths of tegumen and saccus, apex with two or three heavy spines and two or three short spines, the length of the longest slightly shorter than width of aedeagus; base of valves with elongate, narrow, sclerotized band, joining costal swelling opposite distal end of sacculus arm, curving anteriorly and flaring out to join broadly sclerotized base of sacculus; juxta slightly constricted medially, widening posteriorly, with posterior end slightly rounded; aedeagus very long, about one-fifth longer than combined lengths of tegumen and saccus; vesica armed with a very slender, slightly S-shaped, finely dentate strip, in length about one-fourth of length of aedeagus, base flattened, narrowing to rounded piece above, terminal one-half very finely dentate, the teeth small and well separated.

**FEMALE GENITALIA:** Similar to those of *ignavaria*; lamella postvaginalis elliptical, bordered with several lightly sclerotized folds, with a small sclerotized ridge about twice as long as width of lamella postvaginalis, curving anteriorly and passing anteriorly of same, with lamella antevaginalis paralleling the above ridge, more prominent, extending farther laterally; ductus bursae very small, sclerotized, slightly longer than wide; corpus bursae

very long and slender, gradually increasing in width anteriorly.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPE: Number 13026 in the United States National Museum collection; described from a single female.

TYPE LOCALITY: Tehuacan, Puebla, Mexico.

RANGE: Known only from Puebla, in May and September.

REMARKS: Two specimens and two genitalic preparations were studied. The forewings of this species are slightly longer and wider than those of *panda*, and the color is grayer. In addition, the t. p. line is less jagged and does not have the basal extension opposite the cell that is found in *panda*.

The male genitalia of *foeminaria* are like those of *ignavaria* in that both possess very long aedeagi, being longer in each case than the combined lengths of the tegumen and saccus. The aedeagus of *foeminaria* is longer and more slender than the same structure of *ignavaria*. Other differences are to be found in the more terminal location of the costal swelling in *foeminaria*, and the resulting greater length of the sclerotized arm across the base of the valves. The female genitalia are also similar to those of *ignavaria* and its Mexican allies. The present species can be separated from them by the small, sclerotized ridge anterior to the lamella postvaginalis, and by the longer, raised lamella antevaginalis.

***Glaucina lowensis* (Cassino and Swett),  
new combination**

Plate 26, figures 7, 8; text figures 29, 63, 95

*Coenocharis lowensis* CASSINO AND SWETT, 1925, *Lepidopterist*, vol. 4, p. 35.

MALE: Head, vertex, front, and palpi blackish brown or grayish black, the scales of front and palpi with narrow gray tips; front broad, dorsolateral areas with inner margins straight except for slight ventral concavity, steep-sided and separated by long, prominent groove at top of head, central area slightly swollen; palpi moderate, extending beyond eyes about one-half of the length of eyes; antennae of from 41 to 43 segments. Thorax above dark gray or grayish brown, the scales with narrow, light gray tips; below lighter

gray; legs gray or grayish brown, the fore tibia and all tarsi brown, the segments of the latter in some specimens narrowly bordered distally with gray. Abdomen grayish brown or brownish black above and below, with a few darker scales.

UPPER SURFACE OF WINGS: Forewings, ground color dark gray or grayish brown, more or less heavily overlain with blackish brown scales, producing a uniformly dark gray or blackish brown appearance; t. a. line usually absent or very weakly suggested, when present arising about one-fourth of distance from base, going slightly outwardly oblique to middle of cell, then angled posteriorly and going more or less straight to inner margin; discal dot absent; t. p. line usually weakly represented, or at least indicated in lower part of wing by an indistinct, gray shade line outside t. p. line, when present, t. p. line arising on costa about three-fourths or four-fifths of distance from base, subparallel outer margin with slight outward points on veins and in fold, the strongest ones usually on veins  $M_3$ ,  $Cu_1$ , and 2A; subterminal and terminal areas concolorous with remainder of wing; s. t. line usually absent, when present appearing as diffuse, light gray patches of scales in cells; terminal line black or blackish brown, narrow, usually with small intravenular spots; fringe concolorous with wing. Hind wings light grayish brown, in some specimens becoming slightly darker in outer portion; anal margin light gray, suffused with grayish brown scales; maculation absent except for post-discal line, present above anal angle and extending part way across wing; terminal line and fringe as on forewings, but without intravenular spots.

UNDER SURFACE OF WINGS: Forewings brownish gray, the costa slightly darker; hind wings light gray, with scattered brown scales; both wings without maculation except for narrow terminal line.

LENGTH OF FOREWING: 14 to 19 mm.

FEMALE: Similar to male.

LENGTH OF FOREWING: 13 to 19 mm.

MALE GENITALIA: Uncus with width of base shorter than length of uncus, lateral margins slightly swollen medially, the apex laterally compressed; gnathos with small, flat, projecting, median enlargement; valves with outer angle broadly rounded; costa concave



near base, slightly swollen medially, enlarged anteriorly into valve, the width of swelling three-fourths of width of base of uncus, distal portion tapering into spinose apex; sacculus arm lightly sclerotized, basal portion somewhat flattened, slightly enlarged distally, extending about three-fifths of length of costa, to beyond median costal swelling, in length five-sixths of combined lengths of tegumen and saccus, apex with two heavy spines, their length equal to, or slightly greater than, width of aedeagus; base of valve with sclerotized band angled medially, flaring out to join broadly sclerotized base of sacculus; juxta in form of rectangular plate, with posterior end slightly rounded, its surface finely pitted; aedeagus equal in length to combined lengths of tegumen and saccus; vesica armed with a slender, slightly curving, dentate strip, in length about three-eighths of length of aedeagus, basal portion simple, finely multi-dentate medially, terminal one-half biserrated or uniserrated, with long, thin, teeth.

**FEMALE GENITALIA:** Sterigma with large, elliptical, lightly sclerotized lamella postvaginalis, the surface in some specimens with a few small, longitudinal wrinkles, bordered anteriorly and laterally by a few folds, lamella antevaginalis a lightly sclerotized, V-shaped ridge; ductus bursae small, sclerotized, slightly tapering, longer than wide; corpus bursae elongate, with lightly sclerotized, slightly spirally striated neck, enlarging into ovoid, terminal portion of bursae; signum stellate, large, with variable number of rays. Intersegmental membrane between segments  $A_7$  and  $A_8$  unmodified, rarely with a few convolutions; anterior margin of  $A_8$  with narrow, sclerotized ridge.

**EARLY STAGES:** Unknown.

**FOOD PLANT:** Unknown.

**TYPE:** Holotype, male, in Museum of Comparative Zoölogy at Harvard College, and bearing their type number 16928.

**TYPE LOCALITY:** Mount Lowe, San Gabriel Mountains, Los Angeles County, California.

**RANGE:** Southern California, from the southern Sierra Nevada Mountains of Tulare County southward to the lower elevations of San Diego County and adjacent Baja California. (See fig. 29.) On the wing from April through August, and again in November.

**REMARKS:** Fifty-nine specimens and 15

genitalic preparations were studied. In general appearance *lowensis* is similar to *ignavaria*, but fresh specimens tend to have more grayish black forewings, with less traces of maculation, and to have lighter-colored secondaries. Specimens from the Sierra Nevada and San Gabriel Mountains tend to be large and to have almost immaculate forewings, while some of the Baja California examples, especially the series from Cañon Las Cruces in July, tend to be smaller, lighter and more grayish in color, and with more definite maculation. Other Baja California examples, including some from this same locality, taken in April and November, as well as some of the specimens from San Diego County, California, show an integration in size, color, and pattern with the more typical moths from the north. In general, southern specimens are smaller and paler than northern examples, but this appears to be a clinal variation, as far as can be seen from the present material.

The genitalia of both sexes differ from the corresponding structures of all the preceding species in this group. In the male the difference lies in the nature of the sacculus arm. All the above species have this structure as a heavily sclerotized, tube-like structure; beginning with *lowensis*, the remainder of this group have a more membranous, flattened arm. In the female a prominent change takes place in the signum, as it becomes stellate, rather than transverse, as in the previous species.

#### *Glaucina dispersa*, new species

Plate 26, figures 9, 10; text figures 64, 96

*Coenocharis spaldingata jemezata* CASSINO AND SWETT, 1923, Lepidopterist, vol. 4, p. 6 (*partim*).

**MALE:** Head, vertex, front, and palpi with mixed brownish black and white or light gray scales, the former concentrated between antennal bases and laterally on front; front with rather low dorsolateral areas, their inner margins straight or slightly concave below, with elongate groove dorsally separating the lateral areas, central area flat; palpi extending beyond eyes one-half to three-fourths of the length of eyes; antennae of about 38 or 39 segments. Thorax above with mixed white or grayish white and grayish brown scales, the latter with narrow, light gray tips; below

white or pale gray; legs gray or grayish brown, the fore tibia and all tarsi brown, the segments of the latter narrowly bordered distally with gray. Abdomen grayish brown above and below, with dark brown scales concentrated dorsally near thorax and forming indefinite lines below.

**UPPER SURFACE OF WINGS:** Forewings, ground color white or grayish white, heavily overlain with dark gray and brownish black scales, especially along costa and in outer portion of wing, producing a dark gray color; normal cross lines usually absent, but pattern of the *interruptaria* complex suggested by dark scaling; median area with veins Rs, base of M<sub>1</sub>, and Cu darkened, with narrow dark streak in upper portion of cell, the distal parts of these more or less connected by traces of t. p. line, irregularly dark gray basad thereof as far as normal position of t. a. line, and extending into cubital cell around origin of vein Cu<sub>2</sub>; the fold usually narrowly marked by brownish black for entire length; brownish black mark arising from inner margin and crossing anal vein, as in *interruptaria*; area distad of these markings pale gray, extending basally in cell Cu; subterminal and terminal areas slightly darker than remainder of wing; s. t. line white, complete, forming lengthy outward loops in cells; terminal line black, narrow, with small, intravenular spots; fringe gray, in some specimens whitish next to intravenular spots. Hind wings pale grayish brown, as in *foeminaria*.

**UNDER SURFACE OF WINGS:** Forewings grayish brown, the costa with scattered brown scales; hind wings light gray, with scattered light brown scales; both wings without maculation.

**LENGTH OF FOREWING:** 14 to 16 mm.; holotype, 15 mm.

**FEMALE:** Similar to male.

**LENGTH OF FOREWING:** 13 to 16 mm.; allotype, 15 mm.

**MALE GENITALIA:** Similar to those of *lowensis*; uncus with width of base slightly shorter than length of uncus; valves with outer angle bluntly angled; costa with small concavity near base and with small median swelling, enlarged anteriorly into valve, width of swelling subequal to width of base of uncus; sacculus arm extending about two-thirds of length of costa, to beyond median costal

swelling, in length slightly longer than combined lengths of tegumen and saccus, apex with two heavy spines, their length slightly shorter than width of aedeagus; base of valve with broad sclerotized strip, tapering and slightly angled anteriorly; juxta extending almost to anterior margin of saccus, gently rounded posteriorly; aedeagus slightly longer than combined lengths of tegumen and saccus; vesica armed with a slightly S-shaped, dentate strip, in length about two-fifths of length of aedeagus, basal portion simple, terminally biserrated, with long, rather heavy teeth.

**FEMALE GENITALIA:** Similar to those of *lowensis*; sterigma with poorly defined, elongate, lamella postvaginalis, bounded by several folds, lamella antevaginalis sclerotized, lip-like, U-shaped around lamella postvaginalis, V-shaped on outside, but with rounded apex, extending almost to sclerotized anterior margin of segment A<sub>8</sub>; ductus bursae small, tapering; corpus bursae elongate, with lightly sclerotized, spirally striated neck, in length almost one-half of length of corpus bursae, enlarging into ovoid, terminal portion of bursae; signum stellate, large.

**EARLY STAGES:** Unknown.

**FOOD PLANT:** Unknown.

**TYPES:** Holotype, male, Frijoles Canyon, Bandelier National Monument, Sandoval County, New Mexico, June 19, 1942 (G. H. and J. L. Sperry); allotype, female, Jemez Springs, Sandoval County, New Mexico, August 5. Paratypes, one male, same data as holotype, June 18, 1942; three males and 10 females, same data as allotype, April 30, 1919, May 20, 1919, June 2, 1916, July 16, 20, August 2, 3, 14, 16, September 1, one female bearing a Cassino and Swett paratype label for *jamezata*. Holotype and allotype in the American Museum of Natural History; paratypes in the collection of that institution, of the United States National Museum, of the British Museum (Natural History), and of the Museum of Comparative Zoölogy at Harvard College.

**RANGE:** Known only from the type series, all taken in Sandoval County, New Mexico. On the wing from May to early September.

**REMARKS:** Sixteen specimens and seven genitalic dissections were studied. The maculation of the forewings somewhat resembles

that of *interruptaria*, but the present species lacks the sharply defined, looping, t. a. and t. p. lines of that species. In *dispersa* the pattern tends to be broken up into several segments, and it is unique in this regard. Other characteristic features are the rather low dorsolateral areas of the front, and the distinct, complete subterminal line of the primaries.

The male genitalia of *dispersa* are quite similar to those of *lowensis*. Differences are to be found in the flatter costa of *dispersa*, the longer and thinner sacculus arm, with shorter terminal spines, the more tapering sclerotized strip across the base of the valve, and the slightly longer dentate strip of the vesica, having heavier teeth than are found in *lowensis*.

The female genitalia are also similar to those of *lowensis*. In *dispersa*, the lamella postvaginalis is smaller, narrower, and more poorly defined, the lamella antevaginalis is deeper and more V-shaped, and the striated neck of the corpus bursae is longer than in *lowensis*.

***Glaucina denticularia* (Dyar),**  
new combination

Plate 26, figures 13, 14; text figures 30, 66, 98

*Coenocharis denticularia* DYAR, 1907, Jour. New York Ent. Soc., vol. 15, p. 107. GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 396.

*Coenocharis ochrofuscaria*, W. S. WRIGHT (*nec* Grote), 1920, Bull. Amer. Mus. Nat. Hist., vol. 42, p. 488 (*partim*).

*Coenocharis macdunnoughi*, W. S. WRIGHT (*nec* Grossbeck), 1920, Bull. Amer. Mus. Nat. Hist., vol. 42, p. 488 (*partim*).

MALE: Head, vertex, front, and palpi with grayish brown and brownish black scales, the latter narrowly edged with gray; front with strong to medium swellings in dorsolateral areas, inner margins almost straight, becoming concave ventrally, central area slightly swollen or flat; palpi extending beyond eyes about three-fourths of the length of eyes; antennae of from 37 to 43 segments. Thorax above grayish brown, the scales with narrow, light gray tips; below grayish white; legs with mixed gray and brown scales, the fore tibiae and all tarsi grayish black, the segments of the latter narrowly bordered distally with gray. Abdomen gray above and below, with

scattered brown and blackish brown scales.

UPPER SURFACE OF WINGS: Forewings, ground color gray, heavily overlain with brownish black or grayish brown scales, producing a uniformly dark grayish brown or brownish black appearance; t. a. and t. p. lines varying from complete to obsolescent, dull black or brownish black; t. a. line, when present, arising on costa about one-fourth of distance from base, angled outward in cell, turning sharply basad and subparalleling outer margin to inner margin, with inward-pointing tooth on cubital vein and a more obtuse one in lower portion of cell Cu; discal dot usually absent, in some specimens weakly indicated; lower portion of median area with partial indication or with complete dark line across fold, connecting t. a. and t. p. lines when complete, in some continued basally and distally beyond cross lines; t. p. line slightly better represented than t. a. line, usually entire but in some broken into several distinct fragments, arising on costa about three-fourths of distance from base, subparalleling outer margin, with outward points on veins but not in fold, in some concave opposite cell, in others more strongly represented between anal vein and inner margin, where course is strongly basad, the entire t. p. line bordered distally by narrow gray shade line; subterminal and terminal areas concolorous with remainder of wing; s. t. line varying from complete to absent, when present, narrow, light gray, with outward curves in cells; terminal line black, narrow, with small, intravenular spots; fringe concolorous with wings. Hind wings light gray or grayish brown, becoming darker distally; anal margin light gray, suffused with brownish black scales; maculation absent except for post-discal line, present above anal angle, in some specimens extending part way across wing, shaded distally by pale band; terminal line and fringe as on forewings, but the former without intravenular spots and tending to become weaker in anterior portion of wing.

UNDER SURFACE OF WINGS: Forewings grayish brown or brownish gray, the costa slightly darker; hind wings light gray, with scattered brown scales; both wings without maculation, although discal dots may be present; terminal line narrow, weakly represented.

LENGTH OF FOREWING: 12 to 15 mm.

FEMALE: Similar to male.

LENGTH OF FOREWING: 12 to 16 mm.

MALE GENITALIA: Similar to those of *lowensis*; uncus with width of base about three-fourths of length of uncus; valves with outer margin evenly curved; costa concave near base, evenly swollen medially, enlarged anteriorly into valve, width of swelling slightly less than width of base of uncus; sacculus arm short, extending about three-tenths to one-third of length of costa, not attaining median costal swelling, in length about one-half of combined lengths of tegumen and saccus, apex with two heavy spines, their length equal to width of aedeagus; base of valve with sclerotized band widened posteriorly, tapering anteriorly, the outer margin slightly S-shaped; juxta subrectangular, the apex truncate; aedeagus about one and one-tenth times longer than combined lengths of tegumen and saccus; vesica armed with a slender, slightly curving, dentate strip, in length about two-fifths of length of aedeagus, basal portion simple, terminally biserrated, with long, thin teeth.

FEMALE GENITALIA: Similar to those of *lowensis*; sterigma with lamella postvaginalis poorly defined, elliptical, bounded by a single lateral and anterior fold, or a few such folds, about twice as long as wide, posterior end often not delimited, lamella antevaginalis sclerotized, broadly U-shaped around lamella postvaginalis, distal margins transverse, slightly sloping anteriorly, median portion parallel-sided, extending almost to sclerotized anterior margin of segment A<sub>8</sub>, terminating in a small, lip-like extension; ductus bursae small, slightly tapering, width about equal to length; corpus bursae with lightly sclerotized, spirally striated neck, in length about one-fourth of length of corpus bursae, enlarging into ovoid, terminal portion of bursae; signum stellate. Anterior margin of segment A<sub>8</sub> rather broadly sclerotized, constricted medially.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPE: Holotype, male, type number 10334, United States National Museum collection; this species was described from a single specimen.

TYPE LOCALITY: Chiricahua Mountains, Cochise County, Arizona.

RANGE: Arizona, southern New Mexico, Sonora, and Durango. (See fig. 30.) On the wing in every month except December, January, and February.

REMARKS: Three hundred and eighty-seven specimens and 56 genitalic preparations were studied. This species has the appearance of a small edition of *ignavaria* Pearsall. However, there is virtually no overlap in size between these two species. The present species tends to be paler in color, with the forewings more of a grayish brown and the secondaries more contrasting in color with the primaries.

*Glaucina denticularia* is a variable species in color, maculation, and size. This involves some seasonal dimorphism, as specimens taken in the early spring months are usually large, pale, and relatively immaculate. Moths captured in August and September, on the other hand, tend to be smaller and rather dark and to have more clearly defined maculation. The pattern is usually rather obscure and is often lost on worn specimens. A characteristic feature is the black line in the cubital cell between the two cross lines. This is not always present, but it is usually indicated, at least by a thickening of the t. a. and t. p. lines.

The male genitalia are separable from those of the preceding species by the length of the sacculus arms. In *denticularia*, these are very short, being but one-half of the combined lengths of the tegumen and saccus.

The female genitalia can be separated from those of the preceding species by the shorter and broader lamella postvaginalis and by the different configuration of the lamella antevaginalis. Another point of difference is to be found in the broader sclerotized margin of segment A<sub>8</sub>, with its median constriction.

***Glaucina imperdata* (Dyar),  
new combination**

Plate 26, figures 15, 16; text figures 30, 67, 99

*Coenocharis imperdata* DYAR, 1915, Insec. Inscit. Menstr., vol. 3, p. 82.

*Coenocharis alboceptata* DYAR, 1915, Insec. Inscit. Menstr., vol. 3, p. 82 (*partim*).

MALE: Head, vertex, front, and palpi pale grayish brown, with some brown scales be-

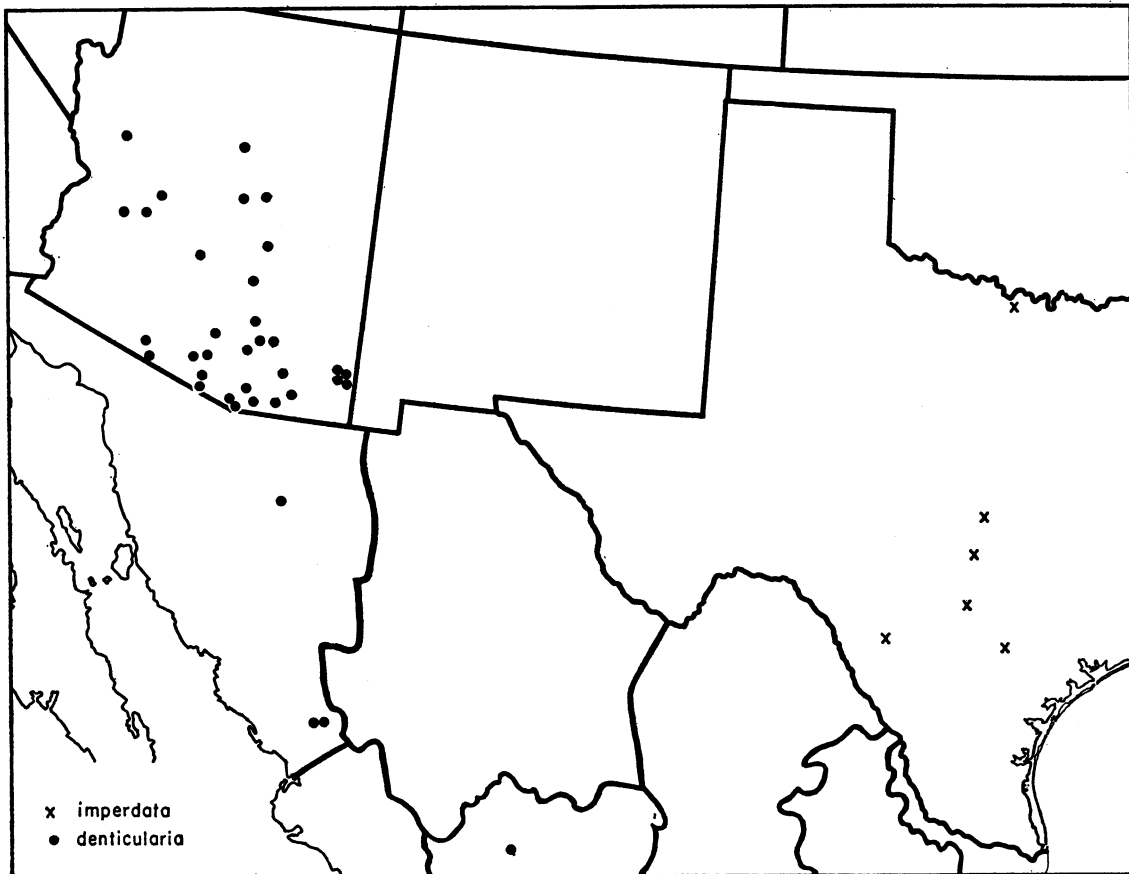


FIG. 30. Distribution of *Glaucina denticularia* (Dyar) and *imperdata* (Dyar).

tween antennal bases and on palpi, the scales narrowly edged with gray; front with straight inner margins to dorsolateral areas, extending to top of head, central area flat; palpi extending beyond eyes about one-half to three-fourths of the length of eyes; antennae of from 41 to 43 segments. Thorax above pale grayish brown, the scales with narrow, light gray tips; below grayish white; legs with mixed gray and brown scales, the fore tibiae and all tarsi brown. Abdomen pale grayish brown above and below, with scattered brown scales, and with trace of incomplete double ventral line.

**UPPER SURFACE OF WINGS:** Forewings, ground color light gray, overlain with grayish brown scales, especially along costa and in outer portion of wing, and with scattered brownish black scales; cross lines as in *denticularia*; t. a. line brownish black, incom-

plete, arising on costa one-fifth to one-fourth of distance from base, going sharply outward into cell, angled basad, apparently subparalleling outer margin, often indicated only by scattered scales on cubital and anal veins and in fold; discal dot absent; lower portion of median area with partial indication or with complete dark line across fold; t. p. line varying from complete to partially obsolete, represented by venular dots, arising on costa about three-fourths of distance from base, usually paralleling outer margin, in some specimens with concave bend opposite cell, protruding as teeth on veins  $M_3$ ,  $Cu_1$ , and  $Cu_2$ , and concave again in fold, the entire t. p. line bordered distally by gray shade line; subterminal and terminal areas darker than basal part of wing; s. t. line varying from complete to absent, when present narrow, light gray, with outward curves in cells; ter-

minal line dark, narrow, obsolescent in anterior part of wing, with small, intravenular spots; fringe concolorous with wing. Hind wings light grayish brown, slightly darkened distally, as in *denticularia*.

UNDER SURFACE OF WINGS: As in *denticularia*.

LENGTH OF FOREWING: 15 mm.

FEMALE: Similar to male.

LENGTH OF FOREWING: 11 to 15 mm.

MALE GENITALIA: Similar to those of *denticularia*; uncus with width of base almost three-fourths of length of uncus; width of costal swelling slightly greater than width of base of uncus; sacculus arm short, extending about one-third of length of costa, not quite attaining median costal swelling, in length about two-thirds of combined lengths of tegumen and saccus, apex with two heavy spines, their length slightly less than width of aedeagus; base of valve with broad sclerotized band, distal margin concave below middle; juxta slightly swollen distally, the apex rounded; aedeagus slightly longer than combined lengths of tegumen and saccus; vesica armed with a slightly curved, dentate strip, in length two-fifths of length of aedeagus, basal portion simple, terminally biserrated with long teeth, in some specimens with minute, sclerotized extension from base, in length about twice the diameter of base of dentate strip.

FEMALE GENITALIA: Similar to those of *denticularia*; sterigma with lamella postvaginalis elliptical or ovoid, bounded by folds, about twice as long as wide, lamella antevaginalis sclerotized, margins inwardly tapering around lamella postvaginalis, distal margins convex posteriorly, narrowly U-shaped anteriorly, extending almost to sclerotized anterior margin of segment A<sub>8</sub>; ductus bursae small, longer than wide; corpus bursae with lightly sclerotized, spirally striated neck, in length about one-third of length of corpus bursae, enlarging into ovoid, terminal portion of bursae; signum stellate. Anterior margin of segment A<sub>8</sub> sclerotized, widened laterally, narrowly concave medially.

TYPES: Dyar did not label any of the type specimens of this species. Under this name in the collection of the United States National Museum there are one male and four females of the original type series. The ab-

domenless male and three females are Bel-frage specimens from Texas, but without any further locality information. The fourth female is the Kerrville specimen, collected by F. C. Pratt. As the last one has complete locality information, and it is the one listed under number 19546 in the type catalogue of the United States National Museum, it is hereby designated as the lectotype.

TYPE LOCALITY: Kerrville, Kerr County, Texas.

RANGE: Central Texas, extending north to the Oklahoma state line at least. (See fig. 30.) On the wing in January, March, April, May, June, and October.

REMARKS: Twenty-one specimens and eight genitalic preparations were studied. This species is similar in appearance to *denticularia*, but can be distinguished from the latter by the paler, more grayish color of the primaries, and by the usually more distinct maculation.

This species is also variable, as the January specimens are large and pale, while examples taken later in the year tend to be smaller and darker. Very little freshly caught material has been examined. The colors given in the description and discussion may have to be slightly revised when additional specimens come to hand.

The male genitalia are very similar to those of *denticularia* but are approximately one-third larger. The proportions of the valves are different, as *denticularia* has a relatively wider valve and a much wider membranous area between the end of the sacculus arm and the costa. Other points of difference are to be found in the costal swelling, as it is slightly larger and more heavily sclerotized in *imperdata*, and the sclerotized band across the base of the valves is of a more uniform width. Also the dentate strip of the vesica is heavier, as are the terminal teeth.

The female genitalia are also like those of *denticularia*, and both are approximately the same size. Differences are to be found in the configuration of the sterigma, as the lamella postvaginalis of *imperdata* is slightly smaller than that of *denticularia*, the sides are more sloping, and the noticeable lip-like median process of the Arizona species is greatly reduced or lacking.

There are a single male specimen, in the

collection of the American Museum of Natural History, from 63 miles west of Santa Barbara, Chihuahua, Mexico, July 20, 1947, elevation 5500 feet (W. J. Gertsch), and a worn pair of large specimens from Mesilla Park, New Mexico, April 8, 10, 1898 (Cockrell) in the United States National Museum collection. These are tentatively placed near *imperdata* owing to the general similarity of the genitalia. More material is needed before these determinations can be considered definite.

***Glaucina nota*, new species**

Plate 26, figures 11, 12; text figures 65, 97

**MALE:** Head, vertex, front, and palpi with pale gray-brown and brown scales, the latter tending to be concentrated between antennal bases and on palpi, the scales narrowly edged with gray; front with dorsolateral areas moderate, upper portion straight, curving inward ventrally, central area flat; palpi extending beyond eyes about three-fourths of the length of eyes; antennae of about 38 segments. Thorax above pale grayish brown, the scales with narrow, light gray tips; below grayish white; legs with mixed gray and brown scales, the fore tibiae and all tarsi brown, the segments of the latter in some specimens narrowly bordered distally with gray. Abdomen grayish brown, with scattered dark brown scales, the latter in several specimens concentrated near base of abdomen dorsally and in some specimens delimiting a faint, geminate, ventral line.

**UPPER SURFACE OF WINGS:** Forewings, ground color gray, heavily overlain with brownish gray scales, especially along costa and outer portion of wing, and with scattered brownish black scales; cross lines as in *denticularia*; t. a. line brownish back, incomplete, appearing as outward bend or elongate dash in cell, angled basad, often indicated only by scales on cubital and anal veins and in fold, the last two usually stronger; discal dot absent; lower portion of median area with complete dark line across fold, in some reduced in middle, or narrowly continued to outer margin; t. p. line usually complete, arising on costa about three-fourths of distance from base, slanting basad to cell, curving outward on veins  $M_3$ ,  $Cu_1$ , and  $Cu_2$ , concave again in fold, outward to anal vein, then sharply

basad to meet inner margin, the entire line usually bordered distally by gray shade line; subterminal and terminal areas slightly darker than, or concolorous with, basal part of wing; s. t. line usually poorly represented; terminal line dark, narrow; with small, intravenular spots; fringe concolorous with wing. Hind wings light grayish brown, slightly darkened distally; as in *denticularia*.

**UNDER SURFACE OF WINGS:** As in *denticularia*.

**LENGTH OF FOREWING:** 12 to 16 mm.; holotype, 12 mm.

**FEMALE:** Similar to male.

**LENGTH OF FOREWING:** 14 to 15 mm.; allotype, 14 mm.

**MALE GENITALIA:** Similar to those of *lowensis*; uncus with width of base about three-fourths of length of uncus; valves with outer margin somewhat angled; costa with only slight concavity near base and median swelling, enlarged anteriorly into valve, width of swelling slightly larger than width of base of uncus; sacculus arm long, extending from about three-fifths to two-thirds of length of costa, extending beyond median swelling, in length between seven-tenths and nine-tenths of combined lengths of tegumen and saccus, apex with two heavy spines, their length slightly shorter than width of aedeagus; base of valve with sclerotized band of more or less even width throughout, angled near anterior end, then flared; juxta with apex rounded; aedeagus slightly longer than combined lengths of tegumen and saccus; vesica armed with slightly S-shaped, dentate strip, in length about one-third of length of aedeagus, basal portion simple, terminally biserrated or multiserrated, with two rows of long teeth.

**FEMALE GENITALIA:** Similar to those of *lowensis*; sterigma with very long and narrow lamella postvaginalis, almost three times as long as wide, bounded by a few folds, lamella antevaginalis sclerotized, small, lip-like, broadly U-shaped, slightly wider than lamella postvaginalis, extending almost to sclerotized anterior margin of segment  $A_8$ ; ductus bursae small, tapering; corpus bursae with lightly sclerotized, spirally striated neck, in length less than one-half of length of corpus bursae, enlarging into ovoid, terminal portion of bursae, tending to be slightly bilobed, a

ventral lobe with stellate signum, and a more elongate dorsal lobe.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPES: Holotype, male, Davis Mountains, Texas, June; allotype, female, same data, September 1–30. Paratypes, 28 males and six females, same data, May 15–30, June 1–15, June, September 1–30, October 15–30; three males and three females, Alpine, Brewster County, Texas, April and May; three males, Brewster County, Texas, June–July, 1926. Holotype and allotype in the Museum of Comparative Zoölogy at Harvard College and bearing their type number 16937; paratypes in the collections of that institution, of the American Museum of Natural History, of the United States National Museum, and of C. P. Kimball.

The main part of the type series was labeled and distributed with a Cassino manuscript name, but it was never published.

RANGE: Known only from the Davis Mountains area of western Texas. On the wing in April, May, June, July, September, and October.

REMARKS: Forty-nine specimens and 16 genitalic preparations were studied. This species is larger and darker in color than *denticularia*. The mark in the fold is usually the most prominent part of the maculation in *nota*, and it is sometimes accompanied by a smaller dash in the cell. In a few specimens the cross lines are broken and looped, as in the *interruptaria* group. In addition, the dorsolateral areas of the front are almost straight in *denticularia*, while in *nota* they are curved ventrally.

The male genitalia are somewhat intermediate in some of their characters between those of *dispersa* and those of *denticularia*. The shape of the uncus is more like that of the latter species, while the length of the sacculus arms is reminiscent of *dispersa*. From *dispersa*, the present species can be distinguished by the fact that the sacculus arms are shorter than the combined lengths of the tegumen and saccus, and by the slightly shorter dentate strip of the vesica. From *denticularia* and *imperdata*, *dispersa* can be recognized by the longer sacculus arms.

The female genitalia of *nota* can be recognized by the very long and slender lamella

antevaginalis and the deeply cut and broad lamella postvaginalis. They can also be separated from those of *dispersa* by the shorter neck and bilobed body of the corpus bursae, and the signum tends to be a bit smaller than in that species.

There is a single male specimen labeled "So. Ariz., Sept. 1900 (Poling)" in the collection of the American Museum of Natural History. By pattern and genitalia this example belongs to *nota*, although the locality data need to be verified.

*Glaucina eureka eureka* (Grossbeck),  
new combination

Plate 27, figures 1, 2; text figures 31, 68, 100

*Coenocharis eureka* GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 396.

MALE: Head, vertex, front, and palpi with light gray and gray-brown scales, the former tending to be concentrated on central area of front, the darker scales narrowly edged with gray; front with dorsolateral areas fairly high, extending well back on top of head, with strong concavity below, central area slightly swollen; palpi extending beyond eyes about three-fourths of the length of eyes; antennae of about 39 or 40 segments. Thorax above pale grayish brown, the scales with narrow, light gray tips; below grayish white; legs with mixed gray and brown scales, the fore tibiae and all tarsi brownish gray, the segments of the latter in some specimens narrowly bordered distally with gray. Abdomen brownish gray above and below, with scattered dark brown scales, the latter often concentrated near base of abdomen dorsally and sometimes forming ventral and sub-ventral lines.

UPPER SURFACE OF WINGS: Forewings, ground color pale gray, overlain with grayish brown scales, especially along costa, producing a rather smooth-appearing gray color; cross lines as in *denticularia*; t. a. line grayish black, incomplete, appearing as outward curve in cell, represented by small groups of scales on cubital and anal veins and in fold; discal dot absent; lower portion of median area usually without line across fold, although it may be indicated by thickening on t. a. and t. p. lines; t. p. line usually complete, arising on costa about three-fourths of dis-



tance from base, course as in *nota*, often strengthened on veins, the entire line faintly margined distally by pale gray shade line; subterminal and terminal areas slightly darker than, or concolorous with, basal part of wings; terminal line dark, narrow, with small, intravenular spots; fringe concolorous with wing. Hind wings light grayish brown, slightly darkened distally; as in *denticularia*.

UNDER SURFACE OF WINGS: As in *denticularia*.

LENGTH OF FOREWING: 16 to 17 mm.

FEMALE: Similar to male.

LENGTH OF FOREWING: 14 to 17 mm.

MALE GENITALIA: Similar to those of *denticularia*; uncus with width of base about three-fourths of length of uncus; width of costal swelling equal to, or slightly greater than, width of base of uncus; sacculus arm short, extending about one-third of length of costa, not attaining median costal swelling, in length about one-half of combined lengths of tegumen and saccus, apex with two heavy spines, their lengths subequal to width of aedeagus; base of valve with sclerotized band broad posteriorly, narrowed and angled below middle; juxta with rounded apex; aedeagus equal to, or slightly longer than, combined lengths of tegumen and saccus; vesica armed with a slightly curved or angled dentate strip, in length about three-eighths of length of aedeagus, basal portion simple, terminally biserrated with rather short, thin teeth.

FEMALE GENITALIA: Similar to those of *denticularia*; sterigma with lamella postvaginalis weakly defined, elliptical, bounded by folds, about twice as long as wide, with several small wrinkles on surface, lamella antevaginalis with wide posterior end, about as wide as length of lamella postvaginalis, tapering anteriorly, distal margins convex posteriorly, tapering medially, U-shaped near sclerotized anterior margin of segment A<sub>8</sub>; ductus bursae short, tapering; corpus bursae with lightly sclerotized, spirally striated neck, in length about one-fourth of length of corpus bursae, enlarging into ovoid, terminal portion of bursae; signum stellate. Anterior margin of segment A<sub>8</sub> sclerotized, widened laterally, narrowly concave medially.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPES: Grossbeck described this species from two females. The lectotype is hereby designated as the moth bearing his type label, the specimen being from Eureka, Utah, May 31, 1910 (Tom Spalding). Both the type and cotype are in the collection of the American Museum of Natural History.

TYPE LOCALITY: Eureka, Juab County, Utah.

RANGE: Utah, northern Arizona, northwestern New Mexico, and Colorado. (See fig. 31.) On the wing in April, May, June, July, and August.

REMARKS: Thirty-six specimens and 14 genitalic preparations were studied. This species can be distinguished by the even, light gray coloration of the forewings above. The dorsolateral ridges of the front are more strongly developed than in *denticularia* and *nota*, and they have the lower portion with a more concave inner margin than is found in *nota*.

The male genitalia are very similar to those of *denticularia* and *imperdata*, as they all have the short sacculus arm. In *eureka* the length of this arm is only about one-half of the combined lengths of the tegumen and saccus, while in *imperdata* the length is about two-thirds of the combined lengths. The dentate strip of the vesica is shorter and not quite so heavy, with less noticeable teeth in *eureka*, as in the other two species.

The female genitalia also show a close relationship to those of both *denticularia* and *imperdata*. In *eureka*, the lamella postvaginalis is wider and shorter than in either of the two preceding species, and the anterior margin of segment A<sub>8</sub> is more deeply indented medially.

The single known Colorado specimen is tentatively referred here, pending the capture of additional material. The example is a male, captured in April. The wings are the brownish color of those of *denticularia*, but the front and genitalia are more like those of *eureka*.

#### *Glaucina eureka agnesae*, new subspecies

Plate 27, figures 3, 4; text figure 31

MALE: Head, vertex, front, and palpi with white and grayish black or grayish brown scaling; antennae of from 38 to 45 segments. Thorax above with mixed white or light gray and grayish brown scales, the darker scales

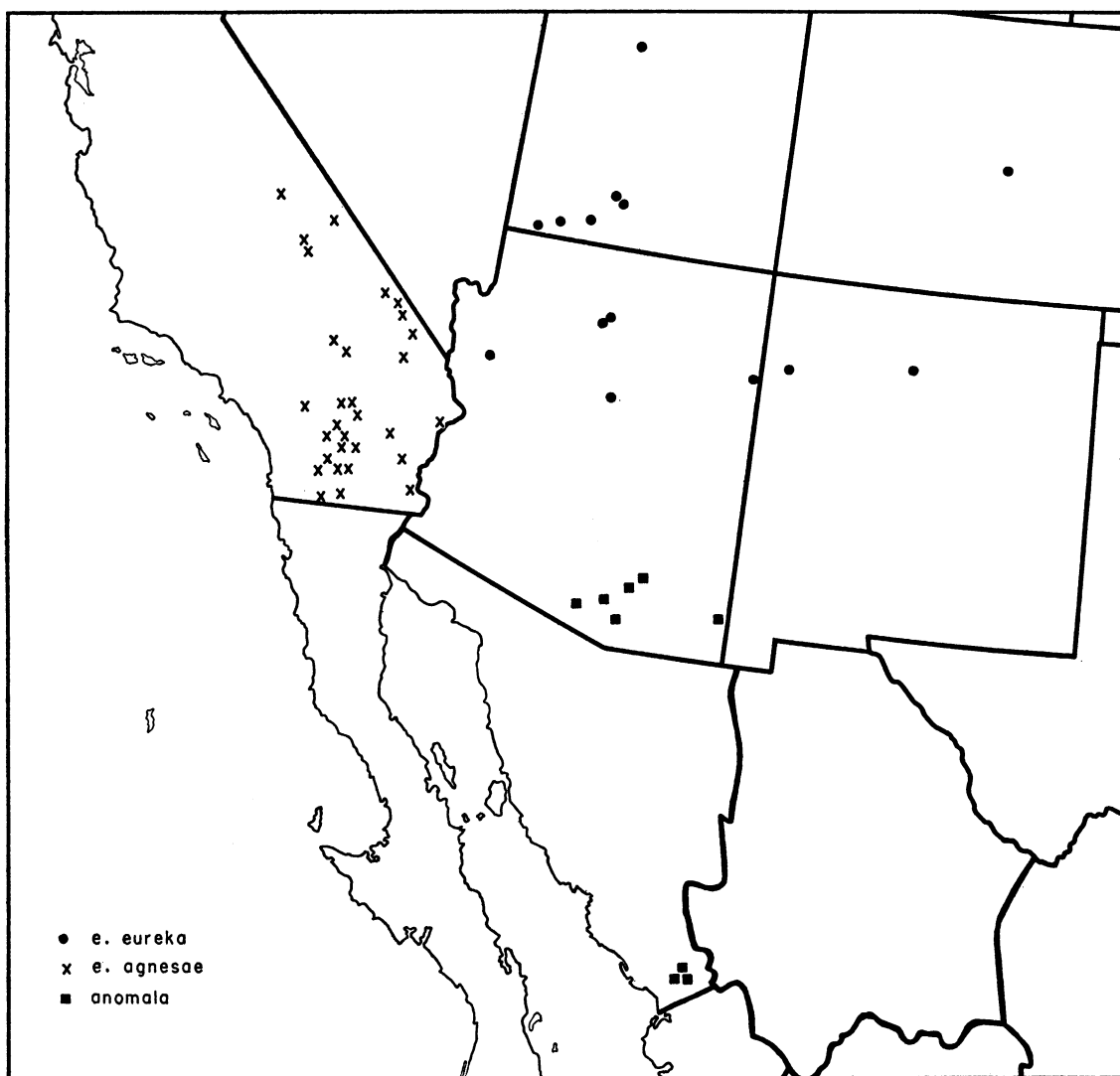


FIG. 31. Distribution of *Glaucina eureka* (Grossbeck) and *anomala*, new species.

having light tips; below whitish. Abdomen similar to thorax, but with blackish gray scaling.

**UPPER SURFACE OF WINGS:** Forewings, ground color white or pale gray, heavily overlain with blackish gray or brownish gray scales, producing a finely speckled appearance; cross lines usually very weak or absent, when indicated, as in nominate subspecies, but not so strongly produced and thickened on veins, t. p. line in some specimens indicated by light gray shade line only; dark scaling tending to concentrate on veins, particularly in median portion of wing, on

cubital and anal veins and in fold, in some continuing to outer edge of wing. Hind wings as in nominate subspecies.

**UNDER SURFACE OF WINGS:** As in nominate subspecies.

**LENGTH OF FOREWING:** 12 to 17 mm.; holotype, 14 mm.

**FEMALE:** Similar to male, with upper surface of forewings tending to be slightly more grayish brown.

**LENGTH OF FOREWING:** 12 to 17 mm.; allotype, 15 mm.

**MALE GENITALIA:** Similar to those of nominate *eureka*, but aedeagus slightly longer

and teeth on dentate strip of vesica stronger.

**FEMALE GENITALIA:** Similar to those of nominate *eureka*.

**EARLY STAGES:** Unknown.

**FOOD PLANT:** Unknown.

**TYPES:** Holotype, male, Palm Springs, Riverside County, California, April 13, 1954 (A. H. Rindge); allotype, female, same data, April 5, 1954. Paratypes, all from California, and listed by counties: *Riverside County:* Twenty-one males and 26 females, same data as types, various dates from January through May, October, and November, 1939–1958 (A. H. Rindge, F. H. Rindge), April 16–23, March 22, 1926; three females, Palm Desert, March 12, 1955, April 1, 1954 (A. H. and S. K. Rindge), April 14, 1952 (R. H. Reid); two females, Split Rock Tank, Mojave Desert, May 31, 1938 (G. H. and J. L. Sperry); two males, Dead Indian Creek, Coachella Valley, January 24, 1947; one female, Temescal Canyon, March 28, 1954 (W. A. Rees); one female, Oasis, February 20, 1937; one female, Coachella Valley, October 23, 1938 (J. A. Comstock); one female, Pinyon Flats, San Jacinto Mountains, May 26, 1952 (R. H. Reid); two males and three females, Indio, October 20, 1921, October 6, March 6, August 6; two females, Chuckawalla Springs, Chuckawalla Mountains, October 26, 1940, December 30, 1939 (J. A. Comstock); one female, Dead Indian Canyon, San Jacinto Mountains, March 3, 1940 (G. Willett); one female, Snow Creek, Coachella Valley, October 22, 1938 (L. M. Martin); one female, Shaver's Well, May 1, 1938 (J. A. Comstock); one female, south end of Coxcomb Mountains, March 3–4, 1935 (G. Willett). *San Diego County:* Nine males and 40 females, Borrego, various dates from November through June, 1940–1956 (G. H. and J. L. Sperry, N. Crickmer, R. Schuster, J. Powell); seven males and 35 females, Tub Canyon, Borrego, various dates from January through May, July, August, November, 1946–1951 (N. Crickmer); three females, Palm Canyon, Borrego, April 1, 1946 (A. L. Melander), March 28, 1936 (Timberlake); one female, Canebrake Canyon, Anza State Park, April 1, 1953 (A. and H. Dietrich); one female, Earthquake Valley, April 22, 1949 (G. H. and J. L. Sperry); two females, San Felipe Valley, February 21, 1938 (J. A. Comstock); Sep-

tember 28, 1941 (C. Henne); two females, Mason Valley, September 15, 1936 (L. Martin); three females, Yaqui Well, Borrego Desert Park, February 24, 1940 (D. Meadows); one male, Jacumba, May 9. *San Bernardino County:* One male and one female, Providence Mountains, April 4, 1934, May 11, 1936 (G. H. and J. L. Sperry); two males, New York Mountains, September 2, 1945 (C. Hill); three males and eight females, Ivanpah Mountains, May 28, 1935 (G. H. and J. L. Sperry), August 30, 1941 (C. Henne), September 5, 1936, September 9, 1934 (L. Martin); two females, Vidal, October 1, 1947 (D. Weedmark); two males and one female, Kingston Mountains, April 17, 1937 (R. H. Andrews and L. M. Martin); one female, Clark Mountains, September 9–10, 1934 (J. A. Comstock); one male, Yermo, March 20, 1937 (J. A. Comstock); one male, Newberry Springs, April 4, 1937 (D. Meadows); one male and three females, Morongo Valley, May 10, 11, 1937 (G. H. and J. L. Sperry), April 27, 1929; three males, Twentynine Palms, March 22, 1958 (R. Leuschner). *Imperial County:* Two males, Indian Well, March 27, 1955 (Ryckman, Lee, and Spencer); three females, Picacho, March 19, 1935 (G. Willett); three males and eight females, San Felipe Wash, February 21, 1938 (G. H. and J. L. Sperry); six females, March 15–30; one female, Coyote Wells, March 15–30. *Inyo County:* Five males and three females, Argus Mountains, April, 1891 ("K."), May 12–14, 1935 (G. H. and J. L. Sperry, J. A. Comstock); two males, Emigrant Springs, Panamint Mountains, April 29, 1932 (G. Willett); two males and four females, Independence, April 14, 1936, May 14, 1936, June 13, 1936 (L. Martin); one male, Darwin, April 27, 1940 (D. Meadows).

Holotype and allotype in the collection of the American Museum of Natural History; paratypes in the collections of that institution, of the Los Angeles County Museum, of the United States National Museum, of the British Museum (Natural History), of the Museum of Comparative Zoölogy at Harvard College, of the Department of Entomology, Cornell University, of the Department of Entomology and Parasitology, University of California, Berkeley, of R. Leuschner, and of the author.

**RANGE:** Southern and eastern California. (See fig. 31). On the wing in every month of the year.

**REMARKS:** Two hundred and forty-six specimens and 28 genitalic preparations were studied. This subspecies can be distinguished from nominate *eureka* by its smaller size, the black-on-white, finely speckled appearance of the forewings above, and by the tendency for the veins to be darkened, producing a striated wing.

An examination of the series shows very little seasonal dimorphism. The males, in general, tend to be slightly smaller than the females, with specimens of both sexes being a bit smaller in the summer and late fall months. There is more variation to be found in the markings of the forewings. Specimens from a single locality and taken at the same time are found to vary from being almost immaculate to having definable cross lines. In virtually all the specimens the darkened veins are present, and this is one of the best diagnostic characters.

More dissections of the female genitalia have been made of *agnesae* than of typical *eureka*, so a greater range of variation is noted. There are some differences in the outline and bounding folds of the lamella postvaginalis and in the shape of the lamella antevaginalis. It is suspected that such differences will also hold true for nominate *eureka* when sufficient material becomes available.

It is with great pleasure that the author names this subspecies after his mother, who not only collected the types and part of the type series, but who has done so much to encourage the author in his collecting and work.

***Glaucina ochrofuscaria ochrofuscaria* (Grote),  
new combination**

Plate 27, figures 5, 6; text figures 32, 101

*Tornos ochrofuscaria* GROTE, 1882, Canadian Ent., vol. 14, p. 186; 1883, *ibid.*, vol. 15, p. 25.

*Lepiodes ochrofuscaria*, HULST, 1887, Ent. Amer., vol. 3, p. 11.

*Lepiodes behrensata ochrofuscaria*, J. B. SMITH, 1891, List of the Lepidoptera of boreal America, p. 71.

*Coenocharis ochrofuscaria*, HULST, 1896, Trans. Amer. Ent. Soc., vol. 23, p. 353. GROSSBECK,

1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 393.

*Coenocharis obscura* GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 395. BARNES AND McDUNNOUGH, 1916, Contributions to the natural history of the Lepidoptera of North America, vol. 3, p. 184. New synonymy.

**MALE:** Head, vertex, front, and palpi with mixed ochraceous and dark brown scales, the latter tending to be concentrated between antennal bases, laterally on the front, and on terminal segment of palpi; front with dorso-lateral areas varying from low to fairly high, with inner margins slightly concave, central area flat; palpi extending beyond eyes about one-half of the length of eyes; antennae of about 35 to 36 segments. Thorax above ochraceous, with scattered dark brown scales, the scales light-tipped; below grayish white; legs grayish white or ochraceous, the fore tibiae and all tarsi brown, the segments of the latter in some specimens narrowly bordered distally with gray. Abdomen ochraceous above and below, with scattered gray and brown scales.

**UPPER SURFACE OF WINGS:** Forewings, ground color pale gray, heavily overlain with ochraceous and dark brown or brownish gray scales, producing a brownish or brownish gray color; cross lines usually weak; t. a. line usually absent, weakly indicated in some; discal dot absent; lower portion of median area usually with thin line along fold; t. p. line usually complete, weakly represented, indicated by faint shade line distally, arising on costa about three-fourths of distance from base, concave opposite cell, outwardly projecting on cubital veins, then strongly bent basad, meeting inner margin between one-third and one-half of distance from base; sub-terminal and terminal areas concolorous with, or slightly darker than, basal part of wing; s. t. line indistinct, often indicated by series of dark, basal, cellular spots; terminal line dark, narrow, with or without minute, intravenular spots; fringe light gray at base, terminally concolorous with wing. Hind wing light grayish brown, slightly darkened distally; as in *denticularia*.

**UNDER SURFACE OF WINGS:** As in *denticularia*.

**LENGTH OF FOREWING:** 12 to 16 mm.

**FEMALE:** Similar to male; forewings above tending to be slightly more grayish, with less

brown scaling, with maculation slightly more distinct.

LENGTH OF FOREWING: 11 to 15 mm.

MALE GENITALIA: Similar to those of *denticularia*; uncus with width of base about three-fourths of length of uncus; width of costal swelling equal to, or slightly greater than, width of base of uncus; sacculus arm, very short, extending about one-fourth or one-fifth of length of costa, not attaining distal edge of sclerotized band across base of valves, in length about one-fifth or one-sixth of combined lengths of tegumen and saccus, or about one-third of that length when basal ridge is included, arm thin basally, distally swollen, apex with two, rarely three or four, heavy spines, their length subequal to, or slightly less than, width of aedeagus; base of valves with sclerotized band broad posteriorly, narrowed below middle; juxta with rounded apex, slight median constriction; aedeagus between one-third and one-half longer than combined lengths of tegumen and saccus; vesica armed with a slightly S-shaped, sclerotized strip, in length about three-eighths of length of aedeagus, broadened and laterally compressed posteriorly, with truncated apex, ventral margin with variable number of blunt teeth, anteriorly tapering to a thin strip, rarely with posterior end not flattened.

FEMALE GENITALIA: Similar to those of *denticularia*; sterigma with lamella postvaginalis weakly defined, elliptical, about twice as long as wide, lamella antevaginalis with wide posterior end, wider than length of lamella postvaginalis, shallowly U-shaped; ductus bursae very short, about three times wider than long, heavily sclerotized except for narrow middorsal strip; corpus bursae with broad, heavily sclerotized neck, slightly longer than wide, sides parallel, surface with variable amount of longitudinal striations, sclerotized ventral side usually slightly longer than dorsal surface, enlarging into ovoid, rather small, terminal portion of bursae; signum stellate, reduced, with fewer and short rays. Anterior margin of segment A<sub>8</sub> sclerotized, in some specimens slightly widened ventrolaterally, flat or slightly concave between these points.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPES: Of *ochrofuscaria*, type number 34266 in the collection of the United States National Museum. Grote had but a single female before him when naming this species.

When describing *obscura*, Grossbeck had a series of five males. Four of these were labeled cotypes; three are now in the collection of the American Museum of Natural History, and the fourth is in the United States National Museum, while the remaining specimen was labeled as type. This last specimen is hereby designated as the lectotype, and it is in the collection of the United States National Museum.

TYPE LOCALITIES: Arizona (*ochrofuscaria*); south Arizona (*obscura*).

RANGE: Southwestern New Mexico and Arizona. (See fig. 32). On the wing from February through September.

REMARKS: Thirty-eight specimens and 19 genitalic preparations were studied. This species is rather poorly represented in collections, especially with recently caught material. It can be recognized by the brownish or grayish brown coloration, with the sharply inwardly directed t. p. line in the lower part of the wing, meeting the inner margin much nearer the base than its origin on the costa.

Taxonomists have had trouble in properly associating the two sexes of this species. The males tend to be larger and browner than the females, and this difference, as well as the scarcity of material, has led to the confusion.

The male genitalia are distinctive in having very short sacculus arms, their length being less than that of the uncus. Some variability seems to exist in the armature of the aedeagus; while most specimens have the sclerotized strip broadened and flattened at the end, there are some examples that are not so, but have a rounded sclerotized piece with a number of teeth on the surface. When a series of genitalic preparations are studied, as in the following subspecies, it becomes possible to connect these extremes fairly well through the individual variation that occurs.

The female genitalia are equally distinctive, with the very narrow, collar-like ductus bursae, and the broad neck of the corpus bursae, both being heavily sclerotized, and the reduced signum.

There is considerable variation in the number of striations on the neck, from none to

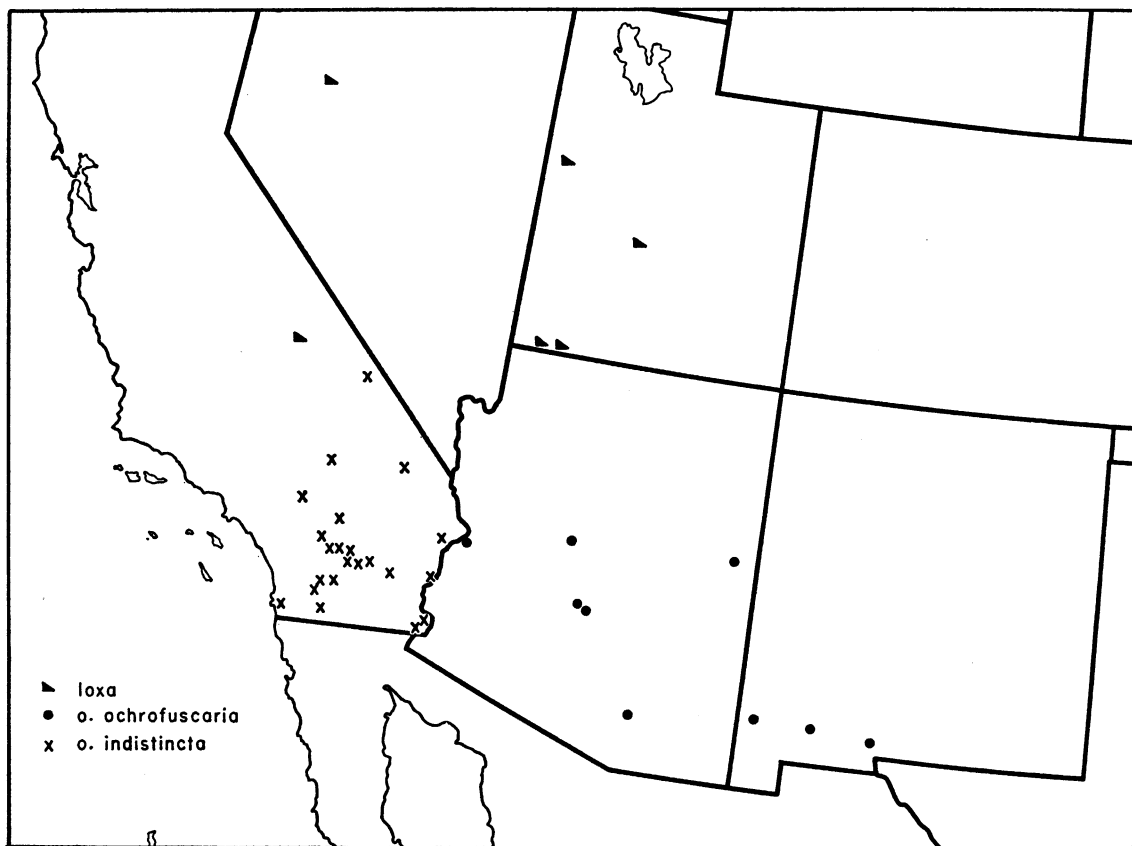


FIG. 32. Distribution of *Glaucina ochrofuscaria* (Grote) and *loxa*, new species.

many. The variation that appears to exist in the length and shape of the neck may be due partly to the way the dissections were mounted.

***Glaucina ochrofuscaria indistincta* (Grossbeck),**  
new combination and status

Plate 27, figures 7, 8; text figures 32, 69

*Coenocharis indistincta* GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 394, fig. 9 (male genitalia).

*Coenocharis albata* CASSINO AND SWETT, 1923, Lepidopterist, vol. 4, p. 5. New synonymy.

**MALE:** Head, vertex, front, and palpi with white and grayish black or grayish brown scaling; antennae of 33 to 37 segments. Thorax above with mixed white or light gray and dark gray, grayish black, or grayish brown scales; below whitish. Abdomen similar to thorax, but with blackish gray scaling.

**UPPER SURFACE OF WINGS:** Forewings, ground color white or light gray, heavily over-

lain with black, blackish brown, or dark grayish brown scales, producing a finely speckled appearance; cross lines slightly better defined than in nominate *ochrofuscaria*, with median area tending to be slightly darker than surrounding areas; s. t. line white, emphasized by brownish gray spots filling basal portions of scallops in line. Hind wings with less brown scaling than in nominate subspecies.

**UNDER SURFACE OF WINGS:** As in nominate subspecies, but more grayish white.

**LENGTH OF FOREWING:** 10 to 15 mm.

**FEMALE:** Similar to male, with upper surface of forewings tending to be slightly more grayish. Under side of primaries in some specimens shaded distally with dark scales.

**LENGTH OF FOREWING:** 10 to 15 mm.

**MALE GENITALIA:** As in nominate subspecies, but slightly smaller.

**FEMALE GENITALIA:** As in nominate subspecies.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPES: Grossbeck described *indistincta* from a series of 13 males and eight females. The specimens bearing his type labels are as follows: male, San Diego, California, August 1, 1910 (George H. Field); female, same data, July 31, 1910. The former is hereby designated as the lectoholotype and the latter as the lectoallotype; both are in the collection of the American Museum of Natural History.

Of *albata*, holotype female in the Museum of Comparative Zoölogy at Harvard College, with their type number 16836.

TYPE LOCALITIES: San Diego, San Diego County, California (*indistincta*); Indio, Riverside County, California (*albata*).

RANGE: Southern and southeastern California. (See fig. 32.) On the wing in every month of the year.

REMARKS: Four hundred and thirty-six specimens and 55 genitalic preparations were studied. This subspecies can be separated from nominate *ochrofuscaria* by its smaller size, especially in the males, paler wing coloration, and more distinct maculation. The males and females are of the same size range in this population. The distribution of the two subspecies appears to meet at the Colorado River; more material is needed from this area, throughout the year, for the exact limits of the range and flight periods to be ascertained.

Much more material is available of this subspecies than of the nominate subspecies. As a result, more variation is noted for *indistincta*, although this is probably present in the Arizona population also. The amount of dark scaling on the wings varies a good deal, as some females are almost entirely white, with very little dark suffusion. It was this type of variant that was described as *albata*, and a number of specimens from the more arid regions dated October seem to be of this pale color. However, it is a seasonal variation, so the name goes into the synonymy.

The genitalic structures and their variations are discussed above.

***Glaucina loxa*, new species**

Plate 27, figure 9; text figures 32, 102

MALE: Head, vertex, front, and palpi with

mixed white, gray, and grayish black scales, the darker scales tending to be concentrated between antennal bases, laterally on the front, and on terminal segment of palpi; front with dorsolateral areas fairly high, inner margins concave below, separated dorsally, central area slightly raised, with weak transverse ventral ridge; palpi extending beyond eyes about two-thirds of the length of eyes; antennae of 37 to 40 segments. Thorax above white, with scattered gray and brown scales, below grayish white; legs grayish white, with scattered brown scales, the fore tibiae and all tarsi brown, the segments of the latter narrowly bordered distally with gray. Abdomen white basally, becoming pale ochraceous, with scattered brown and gray-black scales above and below.

UPPER SURFACE OF WINGS: Forewings, ground color white or very pale gray, overlain with ochraceous, gray, and brown scales, usually concentrated in outer portion of wing; cross lines as in *ochrofuscaria*, usually indicated, with median area slightly darkened; t. a. line weak, arising on costa about one-fourth of distance from base, going outward to cell, sharply curving basad and going straight to inner margin, often indicated only by dark spots on veins and in fold; discal dot absent; lower portion of median area usually with thin, incomplete line along fold, extending to wing margin; t. p. line usually completely indicated, in some specimens represented by dark scales on veins, arising on costa about three-fourths of distance from base, subparalleling outer margin to anal vein, then sharply bent basad, meeting inner margin basad of middle; subterminal and terminal areas usually shaded with darker scales; s. t. line of ground color, shaded basally by brownish gray scales; terminal line dark, narrow, with small intravenular spots; fringe narrowly light gray at base, terminally concolorous with wing. Hind wing light grayish brown, slightly darkened distally, with a faint light band in place of extradiscal line; otherwise as in *ochrofuscaria*.

UNDER SURFACE OF WINGS: As in *ochrofuscaria*, but with terminal portion of primaries shaded with grayish black scales, and in some specimens veins darkened in anterior part of wing to indicate position of t. p. line; secondaries with terminal area darkened, or

concolorous with remainder of wing.

LENGTH OF FOREWING: 11 to 15 mm.; holotype, 14 mm.

FEMALE: Similar to male, but often more heavily shaded with dark scales above and below.

LENGTH OF FOREWING: 12 to 15 mm.; allotype, 14 mm.

MALE GENITALIA: Similar to those of *ochrofuscaria*; width of costal swelling slightly less than width of base of uncus; sacculus arm very short, one-fifth of length of costa, not attaining distal edge of sclerotized band across base of valves, in length about one-third of combined lengths of tegumen and saccus, arm thin basally, distally swollen, apex with two, sometimes three, heavy spines, their length equal to about three-fourths of width of aedeagus; aedeagus slightly more than one-third longer than combined lengths of tegumen and saccus; vesica armed with a sclerotized strip, angled basally, in length about three-eighths or one-half of length of aedeagus, somewhat laterally compressed, terminally with a single, elongate tooth and several small, basal teeth.

FEMALE GENITALIA: Similar to those of *ochrofuscaria*; sterigma with weakly defined lamella postvaginalis, posterior end rounded, anterior end tapering; lamella antevaginalis with wide posterior end, wider than length of lamella postvaginalis, shallowly V-shaped; ductus bursae small, twice as wide as long, heavily sclerotized except for narrow mid-dorsal strip; corpus bursae with broad, well-sclerotized neck, slightly asymmetrical, left side more curving outward than right, surface with numerous longitudinal striations, more or less constricted before enlarging into ovoid, in some specimens small, terminal portion of bursae; signum stellate, reduced. Anterior margin of segment  $A_8$  sclerotized, in some slightly widened ventrolaterally.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPES: Holotype, male, Trout Creek, Ibapah Mountains, Juab County, Utah, June 1 (Tom Spalding); allotype, female, St. George, Washington County, Utah. Paratypes, four males and one female, same data as holotype, June 23, 26, July 16, 20, 1922, August 21; three females, same data as allotype, one without date, June, 1919, and July;

one female, Lodge, Zion National Park, Washington County, Utah, July 13, 1957, elevation 4200 feet (R. H. Leuschner); one female, camp near Lovelock, Humboldt Mountains, Pershing County, Nevada, June 27, 1934 (G. H. and J. L. Sperry); three females, Olancho, Inyo County, California, June 8-15, 24-30. Holotype and allotype in the collection of the American Museum of Natural History; paratypes in the collection of that institution, of the United States National Museum, of the Museum of Comparative Zoölogy at Harvard College, and of R. H. Leuschner.

RANGE: Utah, Nevada, and eastern California. (See fig. 32.) On the wing from late May to mid August.

REMARKS: Eighteen specimens and nine genitalic preparations were studied. This species is closely related to *ochrofuscaria*, but can be distinguished by the fact that the antennae have more segments, by the slightly browner shading of the wings, the more even course of the t. p. line, with its sharp bend above the inner margin, and by the tendency for the outer portion of the primaries, above and below, to be dark shaded. In addition, *loxa* has a more northern distribution than do *ochrofuscaria* and *indistincta*. More material is needed for the full distribution and range of individual variation to be determined.

The genitalia are also similar to those of the preceding species. The male dissections show that the armature of the vesica is distinctive in having the terminal tooth with the several small basal teeth. The females of the present species can be separated by the smaller ductus bursae and by the asymmetrical neck of the corpus bursae.

## GROUP V

The final group has a front with a very long, slender, central tubercle. The fore tibiae are heavily swollen and terminate in an elongate, spine-like extension; both pairs of spines are present on the hind tibia. The male genitalia have an elongate uncus; the sacculus arm is elongate, well sclerotized, with the terminal portion twisted and with numerous spines; the vesica is weakly armed. The female genitalia have a smooth lamella postvaginalis, a short ductus bursae, a large,



membranous corpus bursae, with a small, square, or transverse signum, with weakly dentate margins.

The one known species of this group is rather an anomalous one, in that the front is similar to that found in *Synglochis* Hulst, the fore tibia is swollen as is that of *Eubarnesia* Cockerell, the two parallel cross lines of the primaries are like those found in group I of *Glaucina*, the male genitalia have valves that are somewhat similar to those found in both group II and group IV, and the female genitalia are most similar to those of the one known species of group III.

***Glaucina anomala*, new species**

Plate 27, figures 10, 11; text figures 31, 70, 103

*Coenocharis ochrofuscaria*, W. S. WRIGHT (*neq* Grote), 1920, Bull. Amer. Mus. Nat. Hist., vol. 42, p. 488 (*partim*).

**MALE:** Head, vertex and front ochraceous or pale grayish brown, with some pale gray scales between antennal bases and on sides of front; antennae of about 39 segments; palpi extending beyond eyes about three-fourths of length of eyes, with mixed pale gray and brown scales. Thorax above ochraceous or pale grayish brown, the scales pale gray on ends, below grayish white; legs grayish white, with brown scaling, the tibia brown, with pale gray band on end of each segment; fore tibia with process arising at basal one-fourth of segment and extending to end of segment, with heavy, spine-like process extending on for slightly less than length of process. Abdomen concolorous with thorax, with dark brown scaling.

**UPPER SURFACE OF WINGS:** Forewings with ground color grayish brown, with scattered light gray and brown scales; t. a. line brownish black, arising on costa about one-fourth of distance from base, extending outward into cell, angled basad and running more or less straight to inner margin, the line tending to be slightly thickened on veins and in fold, the line faintly and narrowly shaded basally with pale gray; discal dot absent; t. p. line arising on costa about four-fifths of distance from base, subparalleling outer margin except for slight outward bulge opposite cell and at anal vein, outwardly projecting and thickened on veins and in fold, and faintly

and narrowly shaded distally with pale gray; subterminal area slightly darkened or undifferentiated, with only faint indications of s. t. line; terminal line dark, narrow; fringe concolorous with wing. Hind wings grayish brown, anal margin light gray, with blackish brown scaling; maculation absent except for indication of post-discal line above anal margin, and extending part way across wing; terminal line black, becoming paler in anterior part of wing; fringe as on primary.

**UNDER SURFACE OF WINGS:** Forewings with ground color light grayish brown; without maculation except for indication of t. p. line, represented by dark scale patches on veins; terminal line dark, narrow; fringe concolorous with wing. Hind wings pale gray, becoming grayish brown distally, lightly suffused with dark brown scales; without maculation; terminal line and fringe as on primaries.

**LENGTH OF FOREWING:** 12 to 13 mm.; holotype, 12 mm.

**FEMALE:** Similar to male; antennae of about 42 or 43 segments. Forewings above tending to be slightly more grayish.

**LENGTH OF FOREWING:** 11 to 14 mm.; allotype, 14 mm.

**MALE GENITALIA:** Uncus triangular, elongate, width of base about two-thirds of length of uncus; gnathos slightly widened medially, with bluntly rounded projection; valves with costa almost straight, with small swelling near base, preceded by small indentation, apex not twisted, costal swelling very small; sacculus arm elongate, extending between three-fifths and four-fifths of length of costa, in length slightly more than four-fifths of combined lengths of tegumen and saccus, with slight constriction above base, terminal one-fourth twisted and with several dozen short spines; base of valve with narrow, sclerotized band of uniform width, sharply widened at junction with sclerotized base of valve; juxta slightly narrowed medially; aedeagus slender, four-fifths of combined lengths of tegumen and saccus; vesica armed with a small, slender, sclerotized piece, with anterior end bent.

**FEMALE GENITALIA:** Sterigma with large, smooth, elongate lamella postvaginalis, more than twice as long as wide, lamella antevaginalis very weak; ductus bursae small, well

sclerotized, longer than wide; corpus bursae membranous, elongate; signum small, rectangular or square, with weakly dentate margins. Anterior margin of segment A<sub>8</sub> weakly sclerotized ventrally, laterally well sclerotized, with intersegmental membrane convoluted.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPES: Holotype, male, Redington, Pima County, Arizona; allotype, female, 10 males west of Alamos, Sonora, Mexico, July 21, 1954 (G. M. Bradt). Paratypes, one male, Black Dike Prospect, Sierrita Mountains, Pima County, Arizona, July 26–29, 1916, elevation about 3750 feet; one female, Paradise, Cochise County, Arizona, April 26, 1915; one male, Madera Canyon, Santa Rita Mountains, southern Arizona, July 17, 1956 (C. W. Kirkwood and R. H. Reid); one male, 30 miles east of Quijotoa, Pima County, Arizona, August 28–29, 1927; one male, Tucson, Arizona, July 18; one female, same data as allotype; three females, Minas Nuevas, Sonora, Mexico, August 7, 1952 (P. and C. Vaurie); two females, Alamos, Sonora, Mexico, July 25 to August 7, 1953 (Fred S. Truxal). Holotype and allotype in the collection of the American Museum of Natural History; paratypes in the collections of that institution, of the Los Angeles County Museum, of the United States National Museum, of the Museum of Comparative Zoölogy at Harvard College, of the Department of Entomology, Cornell University, and of C. W. Kirkwood.

RANGE: Known from southern Arizona and Sonora. (See fig. 31.) On the wing in April, July, and August.

REMARKS: Twelve specimens and four genitalic dissections were studied. As mentioned in the discussion following the group characters, this species is rather an anomalous one, as it possesses characters in common with several other species and genera. Because of the long tubercle on the front, it is likely to be mistaken for *Synglochis perumbraria* Hulst, but the present species possesses a fully developed tongue and the highly modified fore tarsus that separate these two species. This last character is possessed by *Eubarnesia ritaria* (Grossbeck), but the type of front is different, as is the presence of the

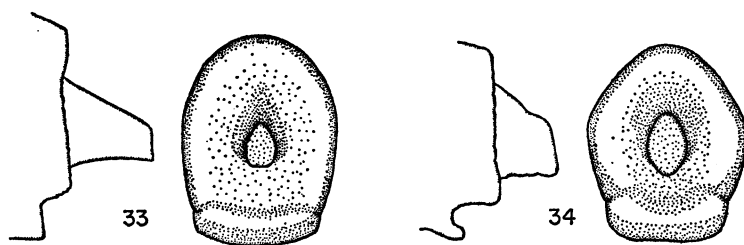
tongue. From all the other known species of *Glaucina*, *anomala* can be separated by the long tubercle on the front and by the fore tarsus. In the male genitalia, this species is recognizable by the twisted terminal portion of the sacculus arm, with its short spines, and by the weak armature of the vesica. The female genitalia have a very weak lamella antevaginalis, and a completely membranous corpus bursae, with a small quadrate signum, all of which will help to distinguish this species.

#### GENUS SYNGLOCHIS HULST

*Synglochis* HULST, 1896, Trans. Amer. Ent. Soc., vol. 23, p. 351. DYAR, "1902" [1903], Bull. U. S. Natl. Mus., no. 52, p. 323. J. B. SMITH, 1903, Check list of the Lepidoptera of boreal America, p. 76. GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 397. BARNES AND McDUNNOUGH, 1917, Check list of the Lepidoptera of boreal America, p. 117. McDUNNOUGH, 1938, Check list, pt. 1, p. 162.

In addition to the characters noted for the tribe: Head, front with a prominent, narrow, outer ridge, sharply recessed just below middle of eyes, ventral margin of front rather deeply recessed, with very long, slender, central tubercle, higher than wide, truncate apically; antennae of about 34 segments, male with pectinations almost reaching apex, of female simple, with a pair of setae at end of each segment; tongue rudimentary or absent; labial palpi reaching only to ridge of front. Thorax without tufts; fore tibia with well-developed, spine-like projection at terminal margin; hind tibia with terminal pair of spurs only. Forewings without areole and without fovea.

MALE GENITALIA: Uncus with apex elongate; gnathos with flattened median enlargement; valves with costal region produced apically, and with numerous spines near end, valvula undifferentiated, sacculus simple, sclerotized, without arm or spines; anellus roughly hexagonal in outline; tegumen without setae on dorsal surface; saccus narrowed anteriorly and projecting well beyond base of valves; aedeagus very long and narrow, longer than combined lengths of uncus, tegumen, and saccus; vesica armed with a single very slender cornutus, occupying at least one-half of the length of aedeagus.



FIGS. 33, 34. Lateral (left) and frontal (right) views of the head, *Synglochis perumbraria* Hulst. 33. Male. 34. Female.

**FEMALE GENITALIA:** Ductus bursae smoothly sclerotized, very narrow, the sclerotized tube longer than apophyses of segment  $A_8$ ; ductus seminalis arising ventrally at junction of ductus bursae and corpus bursae; corpus bursae longer than ductus bursae, posteriorly with a few striations, signum quadrate, with irregular edges.

**EARLY STAGES:** Undescribed.

**TYPE SPECIES:** *Synglochis perumbraria* Hulst, by original designation.

**RANGE:** The semi-arid regions of the southwestern United States, northwestern and northern Mexico.

This genus is represented by a single species that is widespread in the southwest. Good differentiating characters are to be found in the long, narrow tubercle of the front, the vestigial tongue, and the single pair of spurs on the hind tibia. The male genitalia can be distinguished from those of *Glaucina* by the simple valves and by the very elongate and narrow aedeagus, while the female genitalia have a very elongate and narrow ductus bursae.

#### *Synglochis perumbraria* Hulst

Plate 27, figures 12, 13; text figures 33–35, 71, 104

*Synglochis perumbraria* HULST, 1896, Trans. Amer. Ent. Soc., vol. 23, p. 352. GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 397. W. S. WRIGHT, 1920, Bull. Amer. Mus. Nat. Hist., vol. 42, p. 488. RINDGE, 1955, Bull. Amer. Mus. Nat. Hist., vol. 106, p. 152.

*Glaucina puellaria* DYAR, 1907, Jour. New York Ent. Soc., vol. 15, p. 105 (*partim*). BARNES AND MCDUNNOUGH, 1916, Contributions to the natural history of the Lepidoptera of North America, vol. 1, pt. 4, p. 33, pl. 15, fig. 7; 1918, *op. cit.*, vol. 4, p. 151.

*Glaucina* species, W. S. WRIGHT, 1920, Bull. Amer. Mus. Nat. Hist., vol. 42, p. 488 (*partim*).

*Coenocharis utahensis* CASSINO AND SWETT 1924, Lepidopterist, vol. 4, p. 30 (*partim*).

**MALE:** Head, vertex and front with a mixture of grayish white and dark gray, gray-black, or gray-brown scales, the darker scales usually being white-tipped; palpi concolorous with vertex and front. Thorax dark gray or gray-brown above, grayish white below; legs grayish white, with variable amounts of dark gray or brown scaling, the tibiae dark-scaled except for ends of segments; fore tibia with process arising at basal one-fourth of segment and extending the length of tibia, with strong, terminal, spine-like projection twice as wide as tibia. Abdomen dark gray above and below, covered with a mixture of light gray and grayish black scales.

**UPPER SURFACE OF WINGS:** Forewings with ground color light gray, heavily and evenly overlain with dark gray, gray-black, and brown-black scales, producing a rough-looking, dark wing, with two black cross lines usually being the only maculation; t. a. line varying from prominent to obsolescent, arising on costa about one-third of distance from base, in some specimens with a small outward bend in cell, then angled inward and running more or less straight to inner margin at one-third or one-fourth of distance from base; discal dot absent; t. p. line, when distinct, arising on costa about three-fourths of distance from base, with small outward bend at costa, turning sharply and subparalleling outer margin, with basal bends in cells  $M_1$  and  $M_2$  and again when crossing vein  $Cu_2$ , the line, in some, with small outward projections on veins and a faint indication of light distal shading; subterminal area usually undifferentiated, in some specimens with center slightly darkened; terminal line black, narrow; fringe long, unicolorous dark gray. Hind

wings light gray, lightly suffused with grayish brown scales, anal margin whitish, broadly suffused with blackish scales; maculation absent except for indication of double post-discal line at anal margin; terminal line black, weakly defined in costal portion of wing; fringe grayish brown, becoming grayish black posteriorly.

**UNDER SURFACE OF WINGS:** Ground color of forewings light gray, sparsely covered with darker scales, the latter more prominent along costa and distally; without maculation; fringe concolorous with wing. Hind wings grayish white, evenly suffused with gray-black scales; no maculation except for faint indication of terminal line; fringe as on primaries.

**LENGTH OF FOREWING:** 10 to 13 mm.

**FEMALE:** Front with tubercle slightly smaller than in male; fore tibia with process arising just basad of center of segment and with terminal spine-like projection twice as long as width of tibia.

**UPPER SURFACE OF WINGS:** Forewings tending to be slightly browner than in males, in some specimens the wing appearing light brown rather than gray; cross lines tending to be slightly stronger.

**UNDER SURFACE OF WINGS:** As in male, or more suffused with light brown.

**LENGTH OF FOREWING:** 10 to 15 mm.

**MALE GENITALIA:** See generic description.

**FEMALE GENITALIA:** See generic description.

**EARLY STAGES:** Undescribed.

**FOOD PLANT:** Two specimens from Tucson, Arizona, are labeled "larva on Covillea." This presumably refers to creosote bush or greasewood, *Larrea tridentata*, as the former is a synonym of this widespread shrub.

**TYPES:** In the original description, Hulst did not mention the number and sexes in the type series; however, he must have had at least one pair, because both male and female are analyzed in the generic description which was published at the same time. The Hulst collection contained two females (Rindge, 1955), and neither Grossbeck (1912) nor the author has succeeded in locating additional type specimens, including the type male of this species. Grossbeck suggested that the type should be the specimen labeled San Bernardino County, California, through C.

V. Riley; this specimen is hereby designated as the lectotype, and it is in the collection of the American Museum of Natural History.

**TYPE LOCALITY:** San Bernardino County, California.

**RANGE:** Southern California, southern Nevada, southern Utah, and across Arizona to western Texas. In Mexico this species has been taken in Baja California and Coahuila, and it probably occurs between these two states as well. (See fig. 35.) On the wing during every month of the year.

**REMARKS:** One thousand one hundred and forty-nine specimens and 50 genitalic preparations were studied. This is a fairly constant species, although some variation in color and maculation occurs. Some of the color differences are seasonal, as winter and spring specimens tend to be more grayish, while summer and fall examples are browner. In a few cases a rather marked reduction of the frontal tubercle has been noted, but in all other characters the specimens are apparently normal.

This species appears similar to the species of *Glaucina*, but it can be easily distinguished from the latter by the characters given in the keys and in the generic diagnosis.

The specimen from Lowell Ranger Station, Santa Catalina Mountains, Arizona, listed by Wright as *Glaucina* species, unknown, belongs here, as do some of the paratypes of *Coenocharis utahensis* Cassino and Swett.

#### GENUS *EUBARNESIA* COCKERELL

*Barnesia* GROSSBECK, 1910, Jour. New York Ent. Soc., vol. 18, p. 206, pl. 6, figs. 1-5. (Preoccupied by *Barnesia* Bertoni, 1901, Aves Paraguay, p. 77.) BARNES AND McDUNNOUGH, 1917, Check list of the Lepidoptera of boreal America, p. 117.

*Eubarnesia* COCKERELL, 1917, Bull. Brooklyn Ent. Soc., vol. 12, p. 115 (new name for *Barnesia* Grossbeck). McDUNNOUGH, 1938, Check list, pt. 1, p. 162.

*Barnesiata* STRAND, 1926, Arch. Naturgesch., vol. 92, div. A, no. 8, p. 50 (new name for *Barnesia* Grossbeck).

In addition to the characters noted for the tribe: Head, front flattened, with curved, transverse ridge across top, with slight, narrowly O-shaped, central swelling in male, and a low, vertical tubercle in female, barely extending beyond front, the front rough-scaled

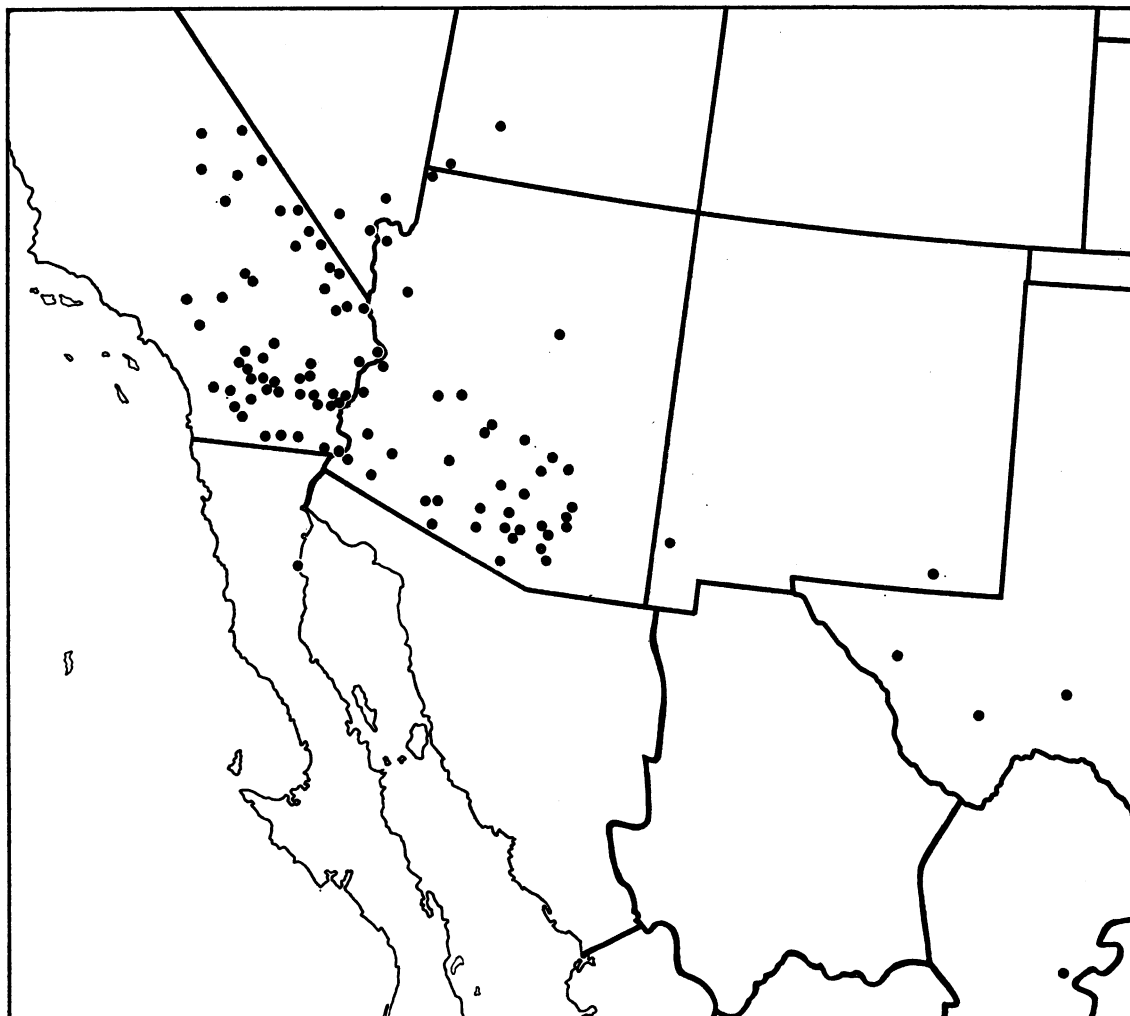


FIG. 35. Distribution of *Synglochis perumbraria* Hulst.

and covered with closely appressed scales; antennae of 32 to 35 segments, the pectinations arising in distal portion of segments, female antennae shortly pectinate, the pectinations about equal in length to length of segments; tongue absent; labial palpi very small, barely reaching lower margin of front, long scales below at base. Thorax with pair of posterior tufts; forelegs, femur and tarsus heavily sclerotized and broadly swollen, the latter with elongate, heavy, claw-like spine; hind tibia with terminal pair of spurs only. Forewings without areole and without fovea;  $R_{1+2}$  arising near middle of cell; hind wings with Sc and R anastomosed along top of cell, ldc longer than m.

**MALE GENITALIA:** Uncus triangular, the apex not produced, broad, bluntly rounded; gnathos produced posteriorly at midline, medially slightly enlarged and roughened; valves with costal region produced apically, the apex with cluster of small setae, valvula and sacculus undifferentiated, the latter more heavily sclerotized than the former, anellus elongate, swollen basally, extending posteriorly to beyond base of valves; cristae present, very long and slender, slightly longer than length of uncus; saccus rounded, projecting short distance beyond base of valves; aedeagus equal to combined lengths of tegumen and saccus, with spine-like process at posterior end; vesica unarmed.

**FEMALE GENITALIA:** Ductus bursae smoothly sclerotized beyond membranous ostial connection, the sclerotized tube shorter than apophyses of segment A<sub>8</sub>; ductus seminalis arising at junction of ductus bursae and corpus bursae; corpus bursae longer than ductus bursae, completely membranous, without signum.

**EARLY STAGES:** The larva and pupae have been described and figured by Comstock and Dammers.

**TYPE SPECIES:** *Barnesia ritaria* Grossbeck, by original designation of both Grossbeck and Cockerell.

**RANGE:** From western Texas to southern California, Sonora, and Baja California.

Another monotypic genus, easily recognized by the flat front, the vestigial tongue, the pectinate female antennae, the highly modified forelegs, and the single pair of spurs on the hind tibia. In the genitalia, the males can be separated by the undifferentiated sacculus and by the relatively short uncus and aedeagus; in the females, by the slender, non-striated ductus bursae, and the lack of the signum in the corpus bursae.

***Eubarnesia ritaria ritaria* (Grossbeck)**

Plate 27, figures 14, 15; text figures 36, 72, 105

*Cedaria ritaria* GROSSBECK, 1910, Jour. New York Ent. Soc., vol. 18, p. 207 (generic *lapsus*); 1911, *ibid.*, vol. 19, p. 62 (correction).

*Barnesia ritaria* GROSSBECK, 1910, Jour. New York Ent. Soc., vol. 18, p. 206, pl. 6, figs. 1-5; 1911, *ibid.*, vol. 19, p. 62. BARNES AND McDUNNOUGH, 1912, Contributions to the natural history of the Lepidoptera of North America, vol. 1, no. 4, p. 33, pl. 15, fig. 13.

*Eubarnesia ritaria*, COCKERELL, 1917, Bull. Brooklyn Ent. Soc., vol. 12, p. 115.

*Barnesiata ritaria*, STRAND, 1926, Arch. Naturgesch., vol. 92, div. A, no. 8, p. 50.

**MALE:** Head, vertex, front, and palpi with white and black-brown scales, the scales of vertex often narrowly tipped with white. Thorax above concolorous with head, posterior tuft white-tipped, of gray-black scales; under side grayish brown; legs gray or gray-brown, with scattered brown scales. Abdomen above with a mixture of white, gray-brown, and blackish scales, in some specimens the darker scales concentrated on ante-

rior portion of dorsum of basal segments; under side with fewer dark scales.

**UPPER SURFACE OF WINGS:** Forewings with ground color light gray, more or less heavily overlain with gray-brown and black scales, especially in median area of wing; basal line present in some, black; t. a. line black, narrow, arising on costa one-third of distance from base, outwardly oblique to cell, turning and going straight to inner margin one-fourth of distance from base; discal spot absent; median shade line present, broader than t. a. and t. p. lines, crossing middle and outer portions of median area in a slightly sinuous course, becoming contiguous with t. p. line above inner margin; t. p. line black, narrow, arising on costa two-thirds of distance from base, subparalleling outer margin to meet median shade line near middle of inner margin, in some specimens shaded distally by a pale orange-brown shade line, especially below cell; subterminal area of ground color, contrasting with darker median area; s. t. line represented by scattered darker scales to form a diffuse band, becoming strongest above inner margin; terminal area suffused with darker scales; terminal line black, narrow, in some narrowly interrupted by veins; fringe narrowly white basally, gray-black distally. Hind wings completely and evenly suffused with dark grayish brown, except for indication of double post-discal line at anal margin, the latter marked with black scales; terminal line and fringe as on primaries.

**UNDER SURFACE OF WINGS:** Forewings grayish brown, except for apex of wing and part of outer margin, which are grayish white, with numerous gray-brown and black-brown scales; without maculation; terminal line weaker than above; fringe largely white, darkened opposite veins. Hind wings light gray, evenly suffused with black-brown scales; maculation variable, in some specimens with a rather broad, diffuse, dark, antemedian band and a narrower median line present, in some specimens without maculation; terminal line and fringe as on primaries.

**LENGTH OF FOREWING:** 9 to 11 mm.

**FEMALE:** Upper surface of wings: Similar to that of wings of male, but tending to be more heavily suffused with dark shading, showing less contrast as a result.

**UNDER SURFACE OF WINGS:** Forewings less broadly suffused with grayish brown than are those of the male, and with cross lines indicated in some specimens.

**LENGTH OF FOREWING:** 11 to 13 mm.

**MALE GENITALIA:** See generic description.

**FEMALE GENITALIA:** See generic description.

**EARLY STAGES:** Unknown.

**FOOD PLANT:** Unknown.

**TYPES:** Grossbeck described this species from five specimens, two males and three females, from the Barnes collection. The specimen with the "male type" label in the collection of the United States National Museum is hereby designated as the lectoholotype, and the specimen bearing the "female type" label in the collection of the American Museum of Natural History is designated as the lectoallotype.

**TYPE LOCALITY:** Santa Catalina Mountains, Pima County, Arizona.

**RANGE:** The Arizona upland, or Sahuaro Desert of southern Arizona, and western Texas. (See fig. 36.) On the wing from April through September.

**REMARKS:** Fifty-three specimens and seven genitalic preparations were studied. This is a fairly constant species in color and maculation, although specimens that are old and worn tend to become brownish.

***Eubarnesia ritaria arida*, new subspecies**

Plate 27, figures 16, 17; text figure 36

*Barnesia ritaria*, W. S. WRIGHT, 1923, Proc. California Acad. Sci., ser. 4, vol. 12, p. 113.

*Barnesiata ritaria*, J. A. COMSTOCK AND DAMMERS, 1942, Bull. Southern California Acad. Sci., vol. 41, p. 46, pl. 12, figs. A-C (larva, pupa).

**MALE:** Head, thorax and abdomen white, with scattered dark scales.

**UPPER SURFACE OF WINGS:** Forewings with ground color light gray, with scattered dark gray and gray-black scales, the median area not darker than remainder of wing; maculation as in nominate subspecies, but with cross lines more weakly represented, in some incompletely so, the t. p. line most prominent as a black dot on vein  $Cu_1$  and as a short line crossing anal vein. Hind wings suffused with pale grayish brown, becoming somewhat lighter distally, with a light, diffuse, some-

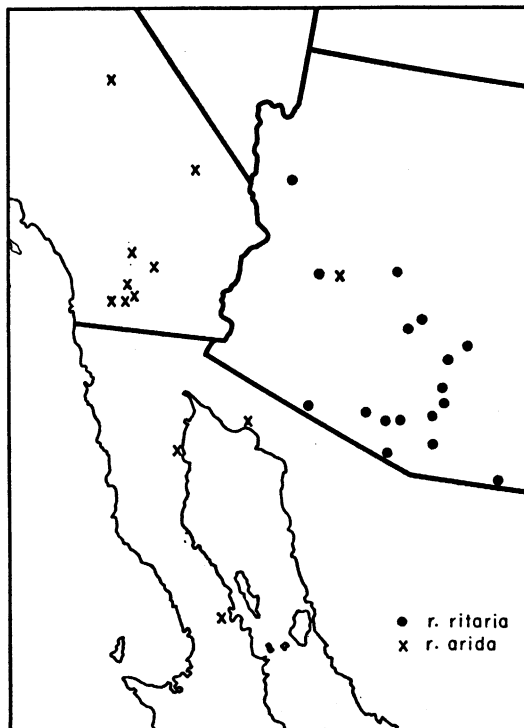


FIG. 36. Distribution of *Eubarnesia ritaria* (Grossbeck).

times geminate band across center of wing representing post-discal line.

**UNDER SURFACE OF WINGS:** As in nominate subspecies, or slightly paler.

**LENGTH OF FOREWING:** 8 to 11 mm.; holotype, 11 mm.

**FEMALE:** Upper surface of wings: Similar to that of wings of male but evenly suffused with gray scales, the maculation becoming rather indistinct.

**LENGTH OF FOREWING:** 10 to 12 mm.; allotype, 10 mm.

**MALE GENITALIA:** As in nominate subspecies.

**FEMALE GENITALIA:** As in nominate subspecies.

**EARLY STAGES:** The mature larva and pupa were described and illustrated by Comstock and Dammers.

**FOOD PLANT:** Ocotillo (*Fouquieria splendens* Engelm.).

**TYPES:** Holotype, male, Borrego, San Diego County, California, May 5, 1941 (G. H. and J. L. Sperry); allotype, female, same

data, June, 1947 (N. Crickmer). Paratypes, 13 males and two females, same data as types, various dates in April, May, June, October, and November, 1941 to 1956 (G. H. and J. L. Sperry, N. Crickmer, R. R. McElvare, J. Powell); 13 males and three females, Tub Canyon, Borrego, San Diego County, California, various dates in April, June, July, August, and December, 1947 and 1951 (N. Crickmer); one male, Palm Canyon, Borrego, San Diego County, California, May 4, 1945 (A. L. Melander); two males and one female, Julian, San Diego County, California, October, 1947 (N. Crickmer); three males, Split Rock Canyon, San Diego County, California, April 12, 1939 (G. H. and J. L. Sperry); seven males, Mason Valley, San Diego County, California, September 15, 23, 1936 (L. M. Martin and J. A. Comstock); six males and one female, Vallecito County Park, San Diego County, California, September 15-16, 1945 (L. M. Martin); one male, Canebrake Canyon, Anza State Park, San Diego County, California, April 1, 1953 (A. and H. Dietrich); 21 males and seven females, Shaver's Well, Riverside County, California, May 1, 1938 (J. A. Comstock), May 30, June 28, July 6, 14, 22, 1936 (bred by C. M. Dammers); one male, Snow Creek, Coachella Valley, Riverside County, California, October 22, 1938 (L. M. Martin); one male, Providence Mountains, San Bernardino County, California, May 1, 1939 (L. M. Martin); two males and two females, Argus Mountains, Inyo County, California, May 13, 1935 (L. M. Martin); four males and one female, Wickenburg, Mariposa County, Arizona, April 30, 1938 (G. H. and J. L. Sperry); one female, La Choya, Sonora, June 12, 1952 (M. Cazier, W. Gertsch, R. Schrammel); 13 males and 27 females, San Felipe, Baja California, June 15, 1952 (M. Cazier, W. Gertsch, R. Schrammel), October 5, 1953 (R. E. Ryckman, R. D. Lee, C. T. Ames). Holotype and allotype in the collection of the American Museum of Natural History; paratypes in the collections of the American Museum of Natural History, of the Los Angeles County Museum, of the British Museum (Natural History), of the Department of Entomology, Cornell University, and of the Department of Entomology and Parasitology, University of California, Berkeley.

**RANGE:** The more arid regions of southern and southeastern California, Arizona, Baja California, and Sonora around the head of the Gulf of California. (See fig. 36.) This subspecies has been captured in every month of the year except January, February, and March.

**REMARKS:** One hundred and thirty-four specimens and three genitalic preparations were studied. This subspecies can be separated from the nominate one by the much paler and more evenly colored wings, with reduced maculation.

Wright (1923) reported this species from Angeles Bay, Baja California, opposite Angel de la Guarda Island. These specimens have not been studied, but it is assumed that they belong here. One other point to be mentioned is the apparent overlap of the distribution of the two subspecies in Maricopa County, Arizona. Six specimens of *arida* are labeled Wickenburg, April 30, 1938, while three males and two females of nominate *ritaria* are from Aguila, May 24 and June 6, 1939. Aguila is located 27 miles west of Wickenburg. Whether or not this apparent overlap is due to some local conditions, whether the April specimens represent a spring generation in this area, or whether there has been an error in labeling remains to be seen.

#### PARAGLAUCINA, NEW GENUS

In addition to the characters noted for the tribe: Head, front bounded by a raised ridge, with a strong central tubercle, the front covered by closely appressed scales; antennae of 34 to 37 segments, male pectinate to apex, female shortly pectinate, the pectinations slightly longer than segments and extending almost to apex; tongue present; labial palpi well developed, heavily scaled, middle segment horizontal, terminal segment drooping, extending just beyond front. Thorax without tufts; fore tibia with strong, spine-like projection at terminal margin, almost twice as long as width of tibia; tibial process arising in basal one-half of segment; hind tibia with two pairs of spurs. Forewings with areole present and without a fovea.

**MALE GENITALIA:** Uncus elongate, apex laterally compressed and with a single point; gnathos elongate, median enlargement very



small or absent; valves with outer margin evenly rounded, costa sclerotized basally and without setal patch distally, sacculus with elongate spine patch, followed distally by a second spinose patch reaching apex of valve; anellus with basal portion rounded, extending posteriorly and expanding into a rounded structure almost twice the diameter of basal portion; saccus projecting short distance beyond base of valves, broadly rounded; aedeagus equal to combined lengths of tegumen and saccus, slightly angled or bent when viewed laterally; vesica armed with a slender, sclerotized rod with spinose apex.

**FEMALE GENITALIA:** Ductus bursae short, sclerotized, collar-like; ductus seminalis minute, arising ventrally from near junction of ductus bursae and corpus bursae; corpus bursae much longer than ductus bursae, pear-shaped, posterior portion striated; signum elliptical, about as long as length of sclerotized portion of ductus bursae, margins dentate.

**EARLY STAGES:** Unknown.

**TYPE SPECIES:** *Glaucina hulstinoides* Grossbeck.

**RANGE:** The desert areas of southern California, northern Baja California, and southern Arizona.

This genus can be distinguished from the other genera in this paper by the areole of the forewings and the pectinate female antennae, the different type of valve in the male genitalia, and by the very short ductus bursae and large, pear-shaped corpus bursae with the elliptical, dentate signum in the female genitalia. It may represent a development similar to that of *Eubarnesia*, but these two genera are nevertheless quite distinct from each other.

In certain respects the present genus is similar to the genus *Morina* Grossbeck, as the latter also has a frontal tubercle, a spine-like process on the distal margin of the fore tibia, and an areole in the forewings. However, the front is elliptical, with sclerotized projections beneath each eye, in *Morina*, as compared to the ovate shape and truncate lower margin of *Paraglaucina*. The male genitalia of *Morina* have a single elongate spine patch in each valve, and the base of the aedeagus is broadly swollen; these both differ from those of the present genus. The most noticeable difference

in the female genitalia is the normal type of ovipositor lobes, and this precludes the presence of *Morina* in this paper. In fact, *Morina* is probably more closely related to *Chesiadodes* Hulst and *Nepterotaea* McDunnough than it is to this entire tribe.

***Paraglaucina hulstinoides* (Grossbeck)**

Plate 27, figures 18, 19; text figures 37, 73, 106

*Glaucina hulstinoides* GROSSBECK, 1912, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 391.

**MALE:** Head, vertex and front with grayish white and brown scales, the scales of vertex usually white-tipped; palpi brown, with white tips on scales, apex of third segment gray-white. Thorax above gray-brown anteriorly and with narrow band of same on metathorax, the scales white-tipped, largely grayish white on mesothorax and on posterior margin of metathorax; under side white; legs with a mixture of grayish white and dark brown scales, the latter concentrated on the tibiae and forelegs; fore tibia with process arising at basal one-third of segment and extending as far as end of the strong, terminal, spine-like projection. Abdomen with a mixture of gray, dark brown, and gray-brown scales above, the terminal margins of segments tending to be narrowly banded with grayish white; beneath paler.

**UPPER SURFACE OF WINGS:** Forewings with ground color light gray, heavily overlain with dark brown and gray-brown scales, with two partially represented blackish cross lines, running parallel to costa in lower portion of wing; costa dark brown, with a few light gray scales; t. a. line absent in costal part of wing, arising on cubital vein about one-half of length of cell from base, running basally to meet inner margin near base, often shaded antero-basally with gray-brown scales; discal dot absent; t. p. line weakly indicated in costal area, arising on costa approximately three-fourths of distance from base as an indistinct dark patch, extending inwardly oblique to vein  $M_1$ , swinging sharply outward and around a nebulous mass of gray-brown scales opposite end of cell, appearing as blackish mark on vein  $M_3$ , then running as a solid blackish line, in some specimens geminate, from about vein  $Cu_1$  to inner margin, paralleling t. a. line, often shaded antero-basally with gray-brown or blackish scales;

subterminal area of ground color, often with scattered dark scales, these concentrated as a shade line parallel with t. p. line in lower part of wing; s. t. line a diffuse dark band more distinct in lower part of wing, followed by a narrow band of ground color and with terminal area narrowly darkened; terminal line black, narrow; fringe narrowly grayish white at base, grayish brown distally. Hind wings slightly paler than forewings, the central portion overlain with gray or gray-brown scales; discal dot faintly represented; maculation absent except for indication of double post-discal line at anal margin, and for an incomplete subterminal line outside narrow band of light gray extending subparallel with outer margin; terminal line and fringe as on primaries.

**UNDER SURFACE OF WINGS:** Ground color of forewings light gray, heavily overlain with darker gray and brown scales, especially near apex; costa dark brown; maculation absent; terminal line and fringe as above. Hind wings light gray, overlain with scattered brown scales, these heaviest in front part of wing and cell; terminal line and fringe as on primaries.

**LENGTH OF FOREWING:** 12 to 15 mm.

**FEMALE:** Front with tubercle slightly smaller than in male; fore tibia with process arising just basad of center of segment.

**UPPER SURFACE OF WINGS:** Similar to that of wings of male, with a maculation tending to be slightly better defined, and with discal spot indicated in some specimens.

**UNDER SURFACE OF WINGS:** As in male.

**LENGTH OF FOREWING:** 12 to 15 mm.

**MALE GENITALIA:** See generic description.

**FEMALE GENITALIA:** See generic description.

**EARLY STAGES:** Unknown.

**FOOD PLANT:** Unknown.

**TYPES:** The original description states that this species was described from seven males

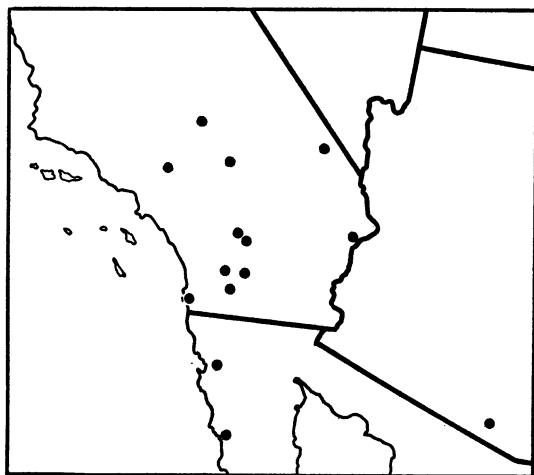


FIG. 37. Distribution of *Paraglaucina hultinoides* (Grossbeck).

and three females. Eight of these specimens are in the collection of the American Museum of Natural History, five being male cotypes, one a female cotype, the other two bearing Grossbeck's type labels. The specimen with the "male type" label is hereby designated as the lectoholotype, and the associated female is designated as the lectoallotype.

**TYPE LOCALITY:** La Puerta, San Diego County, California.

**RANGE:** From southern California into northern Baja California and southern Arizona. (See fig. 37.) On the wing from late September to December; the single Arizona specimen is dated July.

**REMARKS:** Ninety-one specimens and 10 genitalic preparations were studied. This species is fairly constant in color and maculation, although one of the California females has the central portion of the wing heavily suffused with grayish black. The six Baja California examples run a bit darker than the females from southern California, but just what this represents it is difficult to say.

## LIST OF SPECIES, WITH THEIR KNOWN DISTRIBUTION

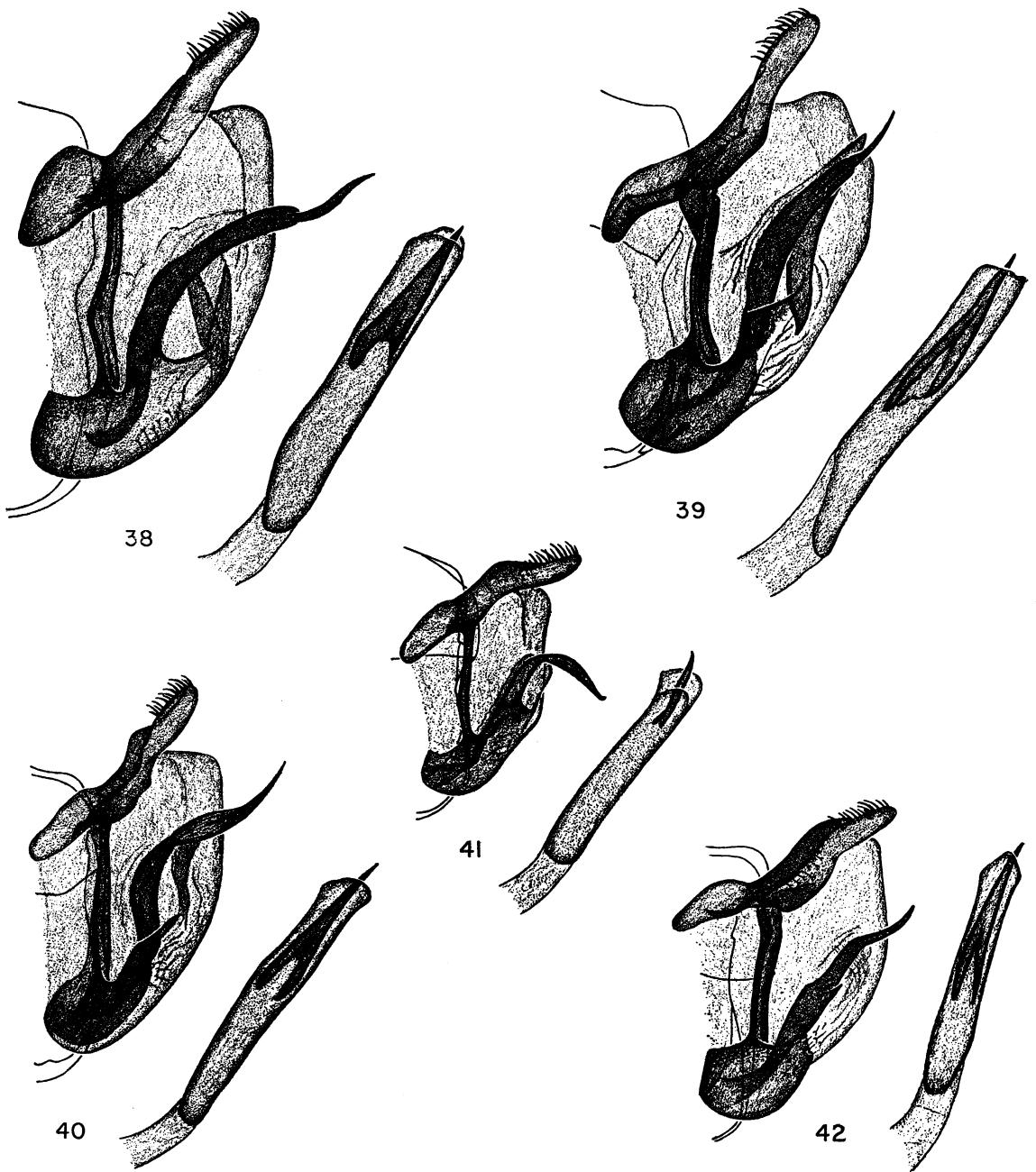
### GENUS *Glaucina* HULST

#### GROUP I

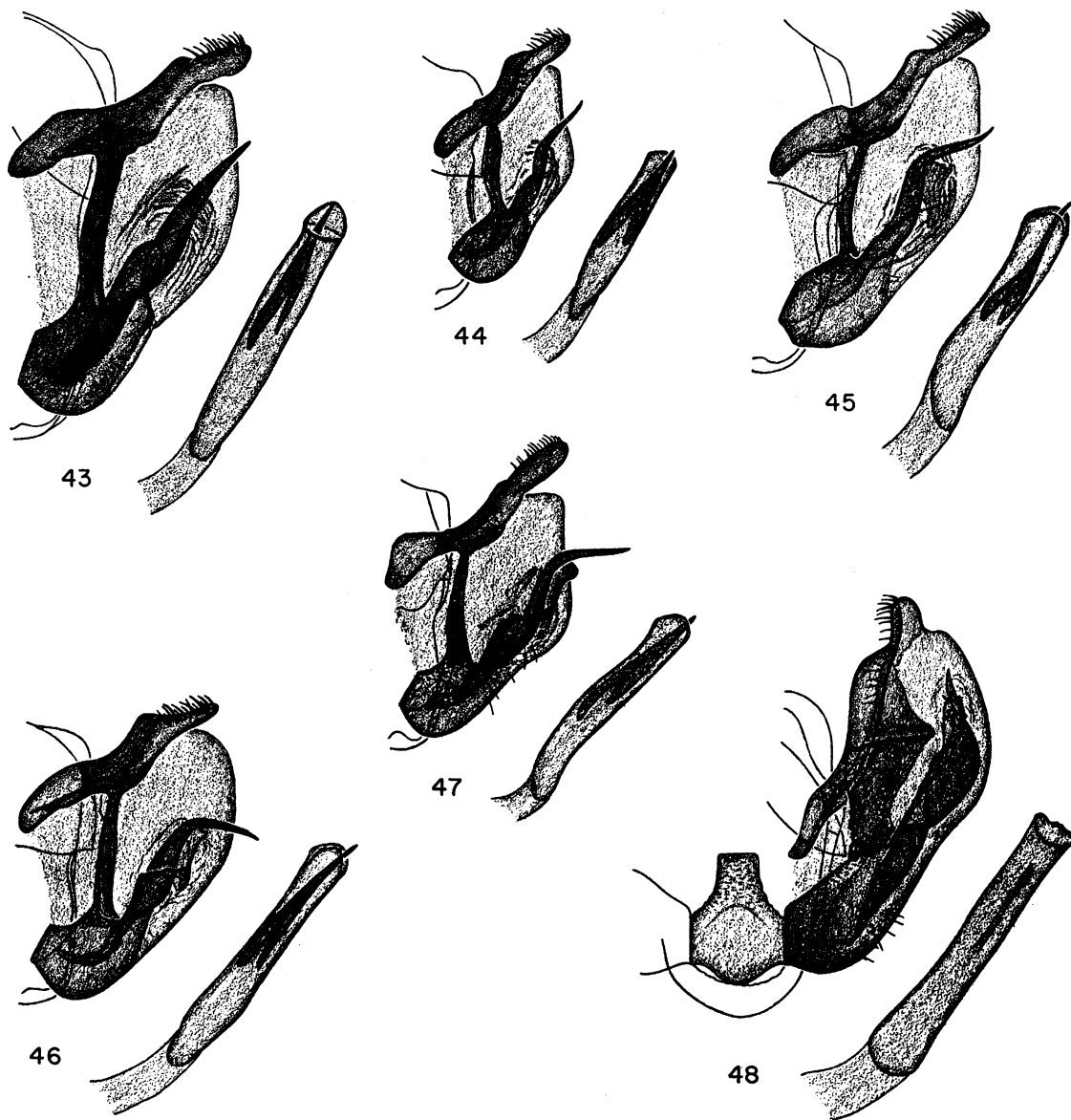
1. *erroraria* Dyar
2. *biartata* Rindge
3. *utahensis* (Cassino and Swett)
4. *cilla* Rindge

Southwestern United States, Sonora, Baja California  
Baja California, California  
Utah, Nevada, California, Arizona  
California

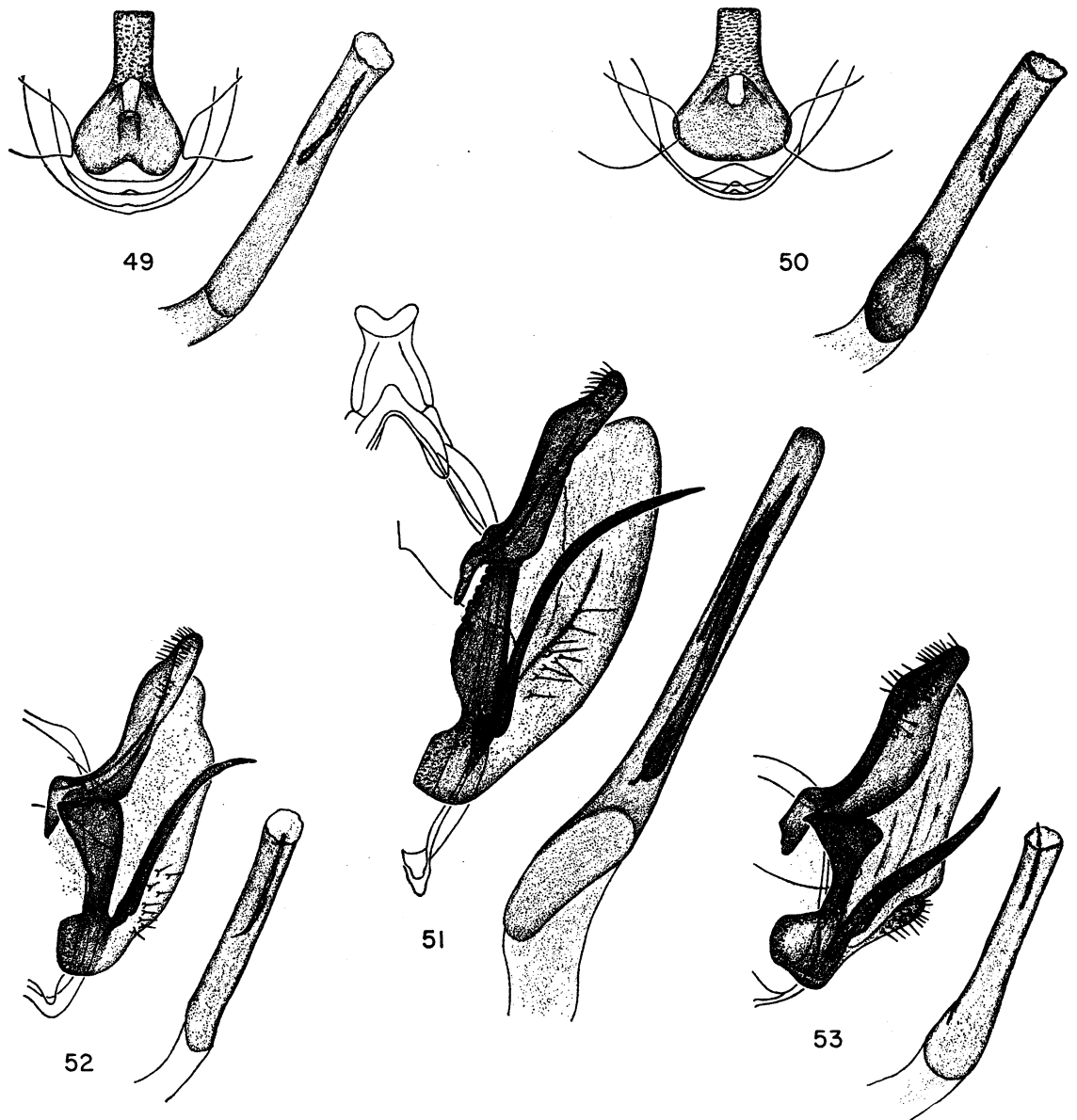
5. *macdunnoughi* (Grossbeck) Arizona, Utah, Nevada, California  
 6. *epiphysaria* Dyar California, Baja California  
 7. *baea* Rindge New Mexico, Arizona, Nevada, California  
 8. *escaria* (Grote) Arizona  
 9a. *eupetheciaria eupetheciaria* (Grote) Arizona, California, Nevada, Utah, Baja California  
     b. *eupetheciaria lucida* Rindge California  
     c. *eupetheciaria osiana* (Druce) Sonora, Arizona  
     d. *eupetheciaria escariola* Rindge Western Texas, New Mexico, Arizona, Sonora, Durango  
 10. *elongata* (Hulst) Texas
- GROUP II
11. *golgolata* (Strecker) Utah, Colorado, Nevada, California  
 12. *magnifica* Grossbeck California, Baja California  
 13. *ampla* Rindge California
- GROUP III
14. *bifida* Rindge California  
 15. *ouden* (Dyar) Guerrero, Michoacan, Puebla  
 16. *gertschi* Rindge Chihuahua
- GROUP IV
- 17a. *interruptaria interruptaria* (Grote) Arizona, New Mexico, Utah, Colorado, Wyoming, California  
     b. *interruptaria alboceptata* (Dyar) Texas  
 18. *spaldingata* (Cassino and Swett) Colorado, Utah, Nevada, Oregon, Washington  
 19a. *gonia gonia* Rindge California  
     b. *gonia microgonia* Rindge California  
 20. *platia* Rindge California, Nevada, Utah, Oregon  
 21. *nephos* Rindge Arizona, Colorado, Idaho  
 22. *infumataria* (Grote) Texas  
 23. *ignavaria* (Pearsall) Arizona, New Mexico, Colorado  
 24. *spina* Rindge Distrito Federal, Mexico  
 25. *panda* Rindge Hidalgo  
 26. *foeminaria* (Dyar) Puebla  
 27. *lowensis* (Cassino and Swett) California, Baja California  
 28. *dispersa* Rindge New Mexico  
 29. *denticularia* (Dyar) Arizona, New Mexico, Sonora, Durango  
 30. *imperdata* (Dyar) Texas  
 31. *nota* Rindge Western Texas  
 32a. *eureka eureka* (Grossbeck) Utah, Colorado, Arizona, New Mexico  
     b. *eureka agnesae* Rindge California  
 33a. *ochrofuscaria ochrofuscaria* (Grote) Arizona, New Mexico  
     b. *ochrofuscaria indistincta* (Grossbeck) California  
 34. *loxa* Rindge Utah, Nevada, California
- GROUP V
35. *anomala* Rindge Arizona, Sonora
- GENUS *Synglochis* HULST
1. *perumbraria* Hulst Southwestern United States, Baja California, Coahuila
- GENUS *Eubarnesia* COCKERELL
- 1a. *ritaria ritaria* (Grossbeck) Arizona, Texas  
 b. *ritaria arida* Rindge California, Baja California, Sonora, ? Arizona
- GENUS *Paraglaucina* RINDGE
1. *hulstinoides* (Grossbeck) California, Arizona, Baja California



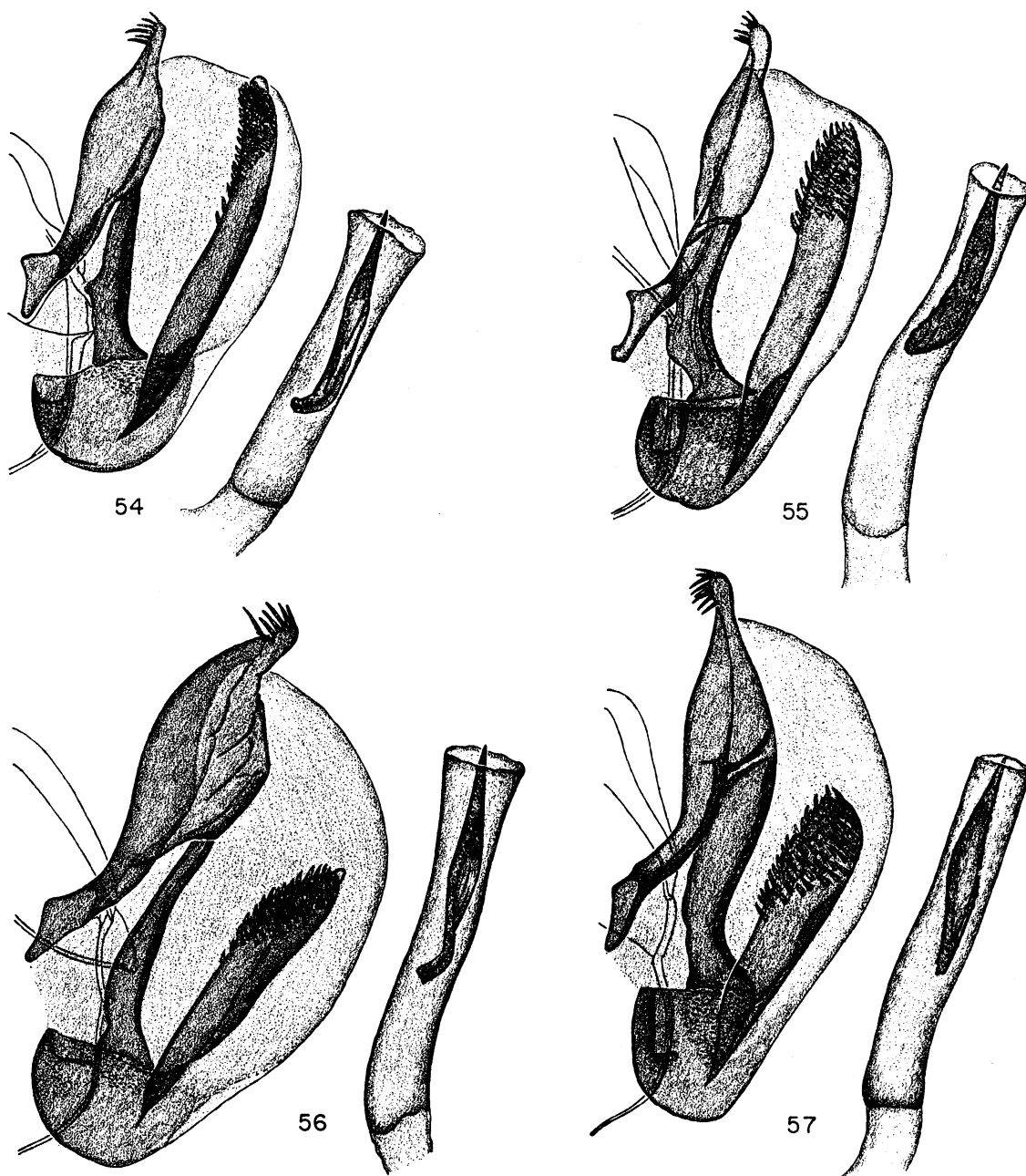
FIGS. 38-42. Male genitalia, showing right valve and aedeagus. 38. *Glaucina erroraria* Dyar, holotype of *pearsalli* Grossbeck, Parker, Arizona, March 12, 1909 (A.M.N.H.). 39. *G. biartata* Rindge, holotype, Rosario, Baja California, March 6, 1935 (A.M.N.H.). 40. *G. utahensis* (Cassino and Swett), Quinlan Mountains, Arizona, April 22, 1938 (G. H. and J. L. Sperry; A.M.N.H.). 41. *G. cilla* Rindge, holotype, Vidal, California, February 20, 1948 (R. Coleman; A.M.N.H.). 42. *G. macdunnoughi* (Grossbeck), Borrego, California, April, 1946 (N. Crickmer; A.M.N.H.).



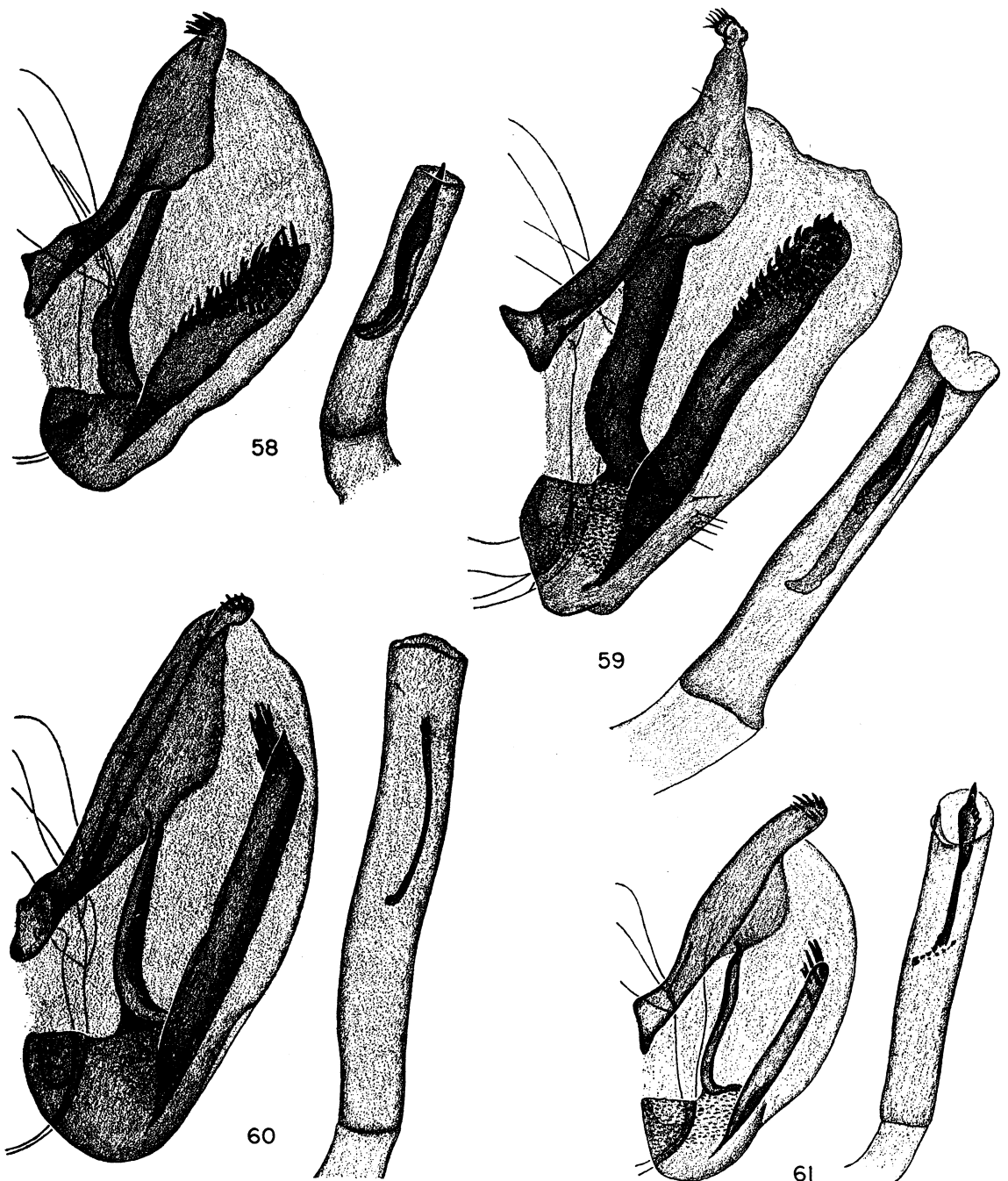
FIGS. 43-48. Male genitalia, showing right valve and aedeagus. 43. *Glaucina epiphysaria* Dyar, San Diego, California, September 28, 1911 (Ricksecker; A.M.N.H.). 44. *G. baea* Rindge, paratype, Shavers Well, California, June 20, 1946 (N. Crickmer; A.M.N.H.). 45. *G. escaria* (Grote), Miami, Arizona, March 11, 1947 (L. H. Bridwell; A.M.N.H.). 46. *G. eupetheciaria eupetheciaria* (Grote), Tucson, Arizona, July 5, 1954 (Cazier and Gertsch; A.M.N.H.). 47. *G. elongata* (Hulst), Presidio, Texas, August 9, 1943 (U.S.N.M.). 48. *G. golgolata* (Strecker), including juxta, Eureka, Utah, August 27, 1911 (T. Spalding; A.M.N.H.).



FIGS. 49-53. Male genitalia. 49. *Glaucina magnifica* Grossbeck, juxta and aedeagus, holotype, San Diego, California, October 3, 1910 (L. E. Ricksecker; A.M.N.H.). 50. *G. ampla* Rindge, juxta and aedeagus, holotype, Upper Santa Ana River, California, September 2, 1948 (G. H. and J. L. Sperry; A.M.N.H.). 51. *G. bifida* Rindge, right valve and aedeagus, holotype, Split Rock Tank, California, May 20, 1938 (G. H. and J. L. Sperry; A.M.N.H.). 52. *G. ouden* (Dyar), right valve and aedeagus, 7 miles south of Tumbiscatio, Michoacan, December 1, 1950 (R. F. Smith; A.M.N.H.). 53. *G. gertschi* Rindge, right valve and aedeagus, holotype, Matachic, Chihuahua, July 7, 1947 (W. J. Gertsch; A.M.N.H.).

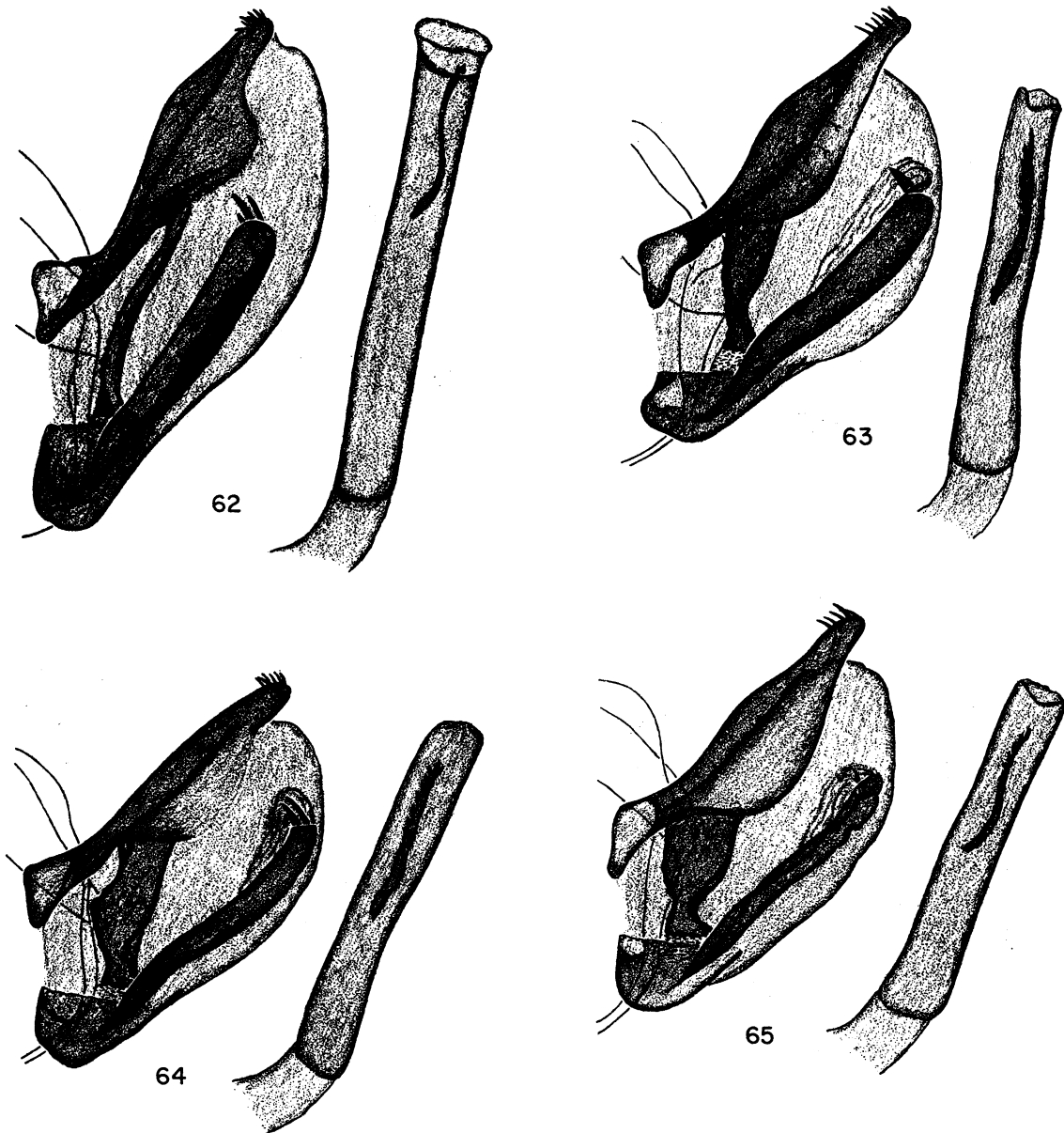


FIGS. 54-57. Male genitalia, showing right valve and aedeagus. 54. *Glaucina interruptaria interruptaria* (Grote), Santa Rita Mountains, Arizona, July 26, 1925 (G. P. Englehardt; A.M.N.H.). 55. *G. spaldingata* (Cassino and Swett), Eureka, Utah, July 31, 1911 (T. Spalding; A.M.N.H.). 56. *G. gonio gonio* Rindge, paratype, Upper Santa Ana River, California, July 8, 1948 (G. H. and J. L. Sperry; A.M.N.H.). 57. *G. platia* Rindge, paratype, Inyo Mountains, California, May 11, 1936 (Andrews and Martin; A.M.N.H.).

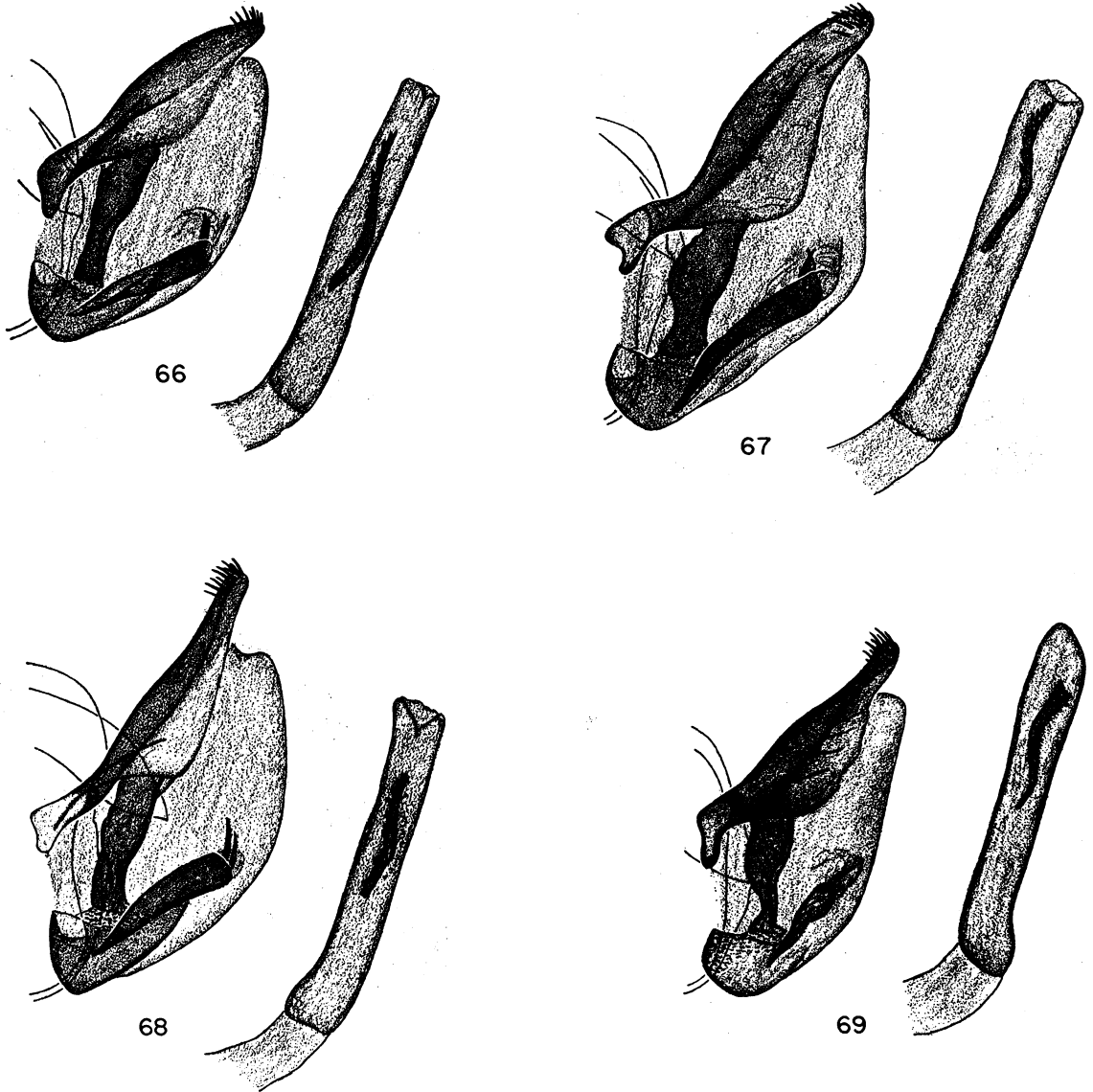


FIGS. 58-61. Male genitalia, showing right valve and aedeagus. 58. *Glaucina nephos* Rindge, paratype, Blackfoot, Idaho, June 2 (A.M.N.H.). 59. *G. infumataria* (Grote), Texas, March 4 (Belfrage; A.M.N.H.). 60. *G. ignavaria* (Pearsall), Madera Canyon, Arizona, August 3, 1947 (Comstock and Martin; A.M.N.H.). 61. *G. spina* Rindge, holotype, San Pedro, D. F., Mexico, January 15, 1917 (C. C. Hoffmann; A.M.N.H.).

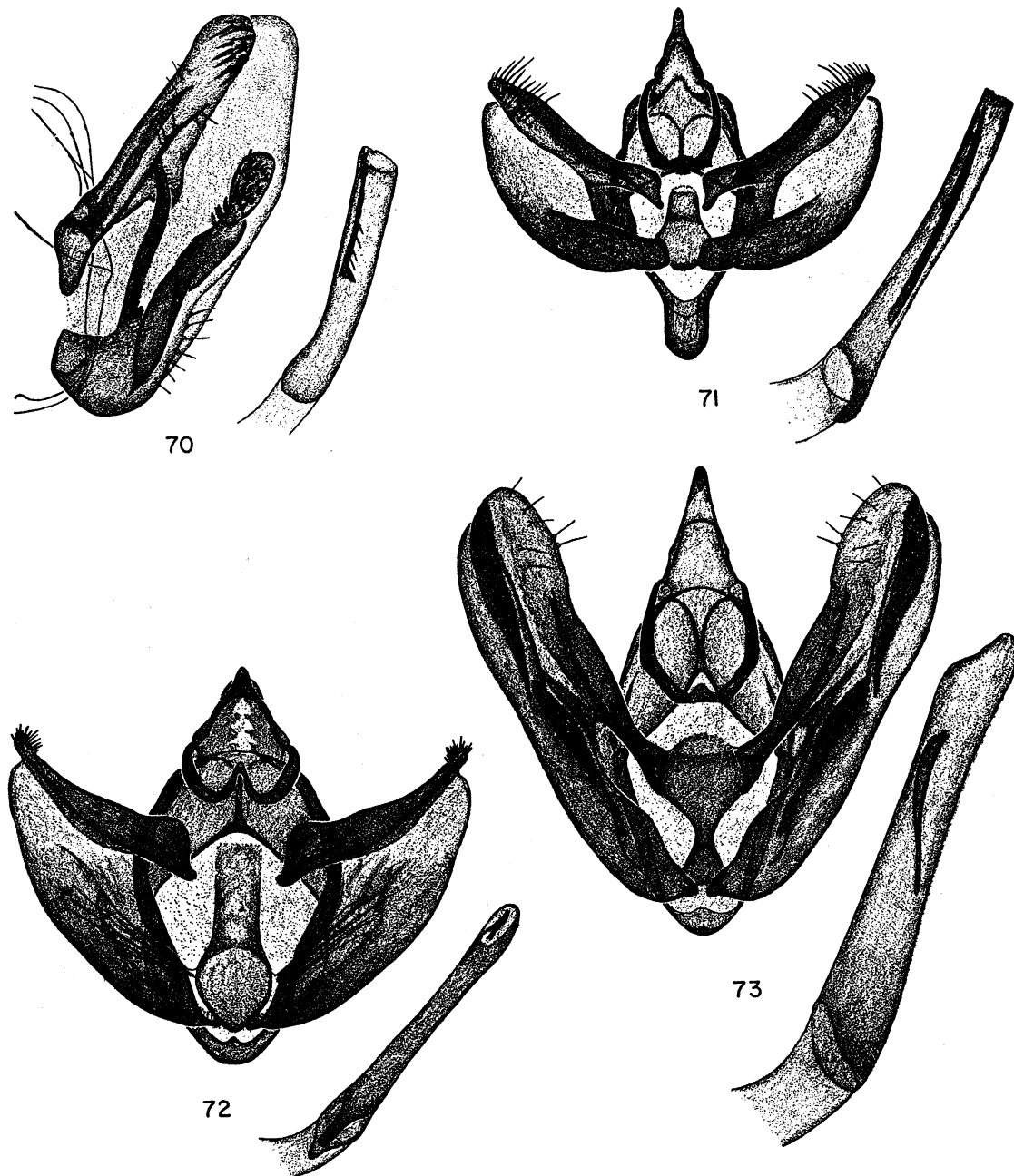




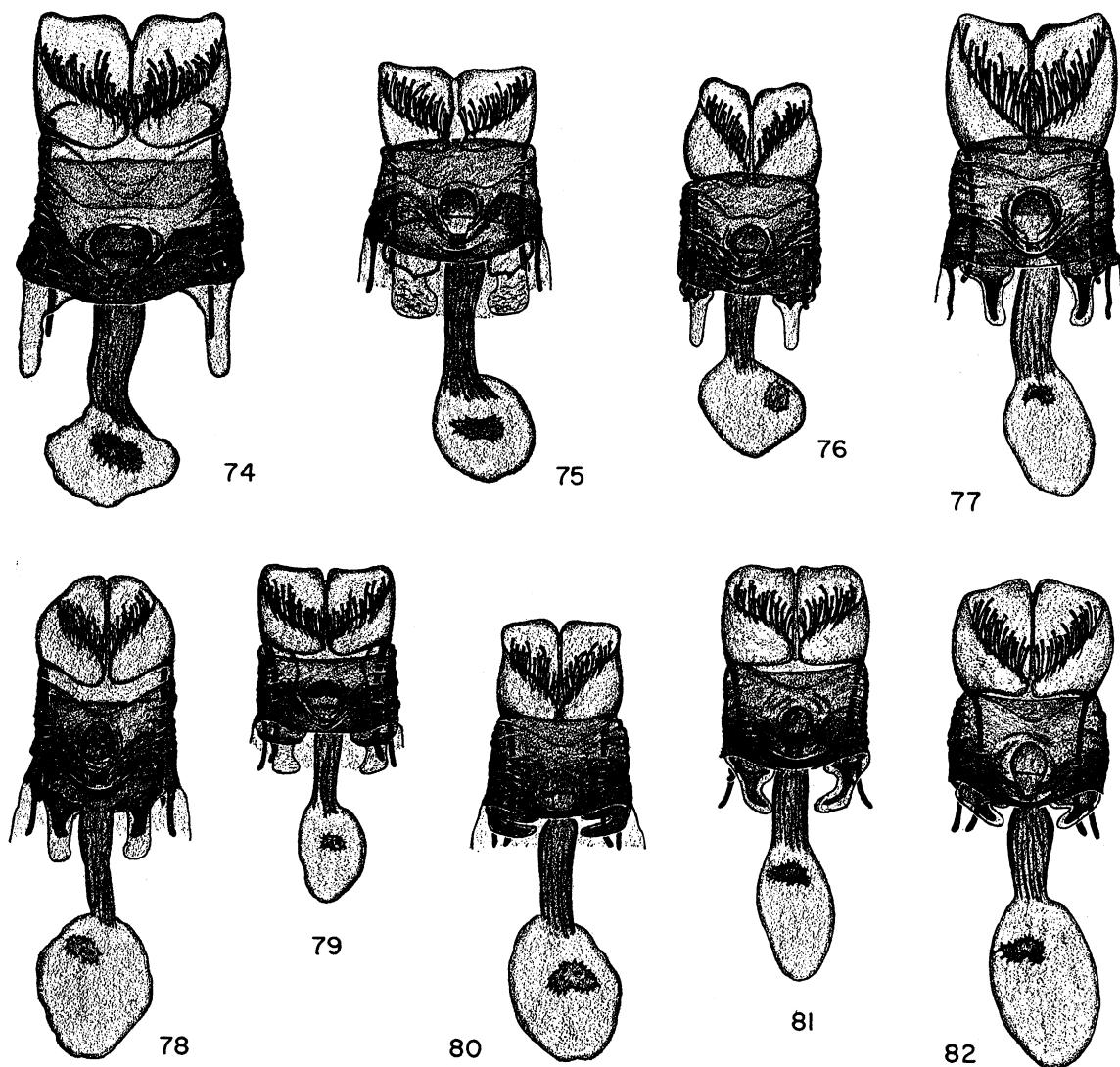
FIGS. 62-65. Male genitalia, showing right valve and aedeagus. 62. *Glaucina foeminaria* (Dyar), 16 kilometers southwest of Zapotitlan de la Salinas, Puebla, May 17, 1952 (Dawson; A.M.N.H.). 63. *G. lowensis* (Cassino and Swett), Smoky Valley, California, June 12, 1945 (Hill; A.M.N.H.). 64. *G. dispersa* Rindge, holotype, Frijoles Canyon, New Mexico, June 19, 1942 (G. H. and J. L. Sperry; A.M.N.H.). 65. *G. nota* Rindge, paratype, Brewster County, Texas, June-July, 1926 (A.M.N.H.).



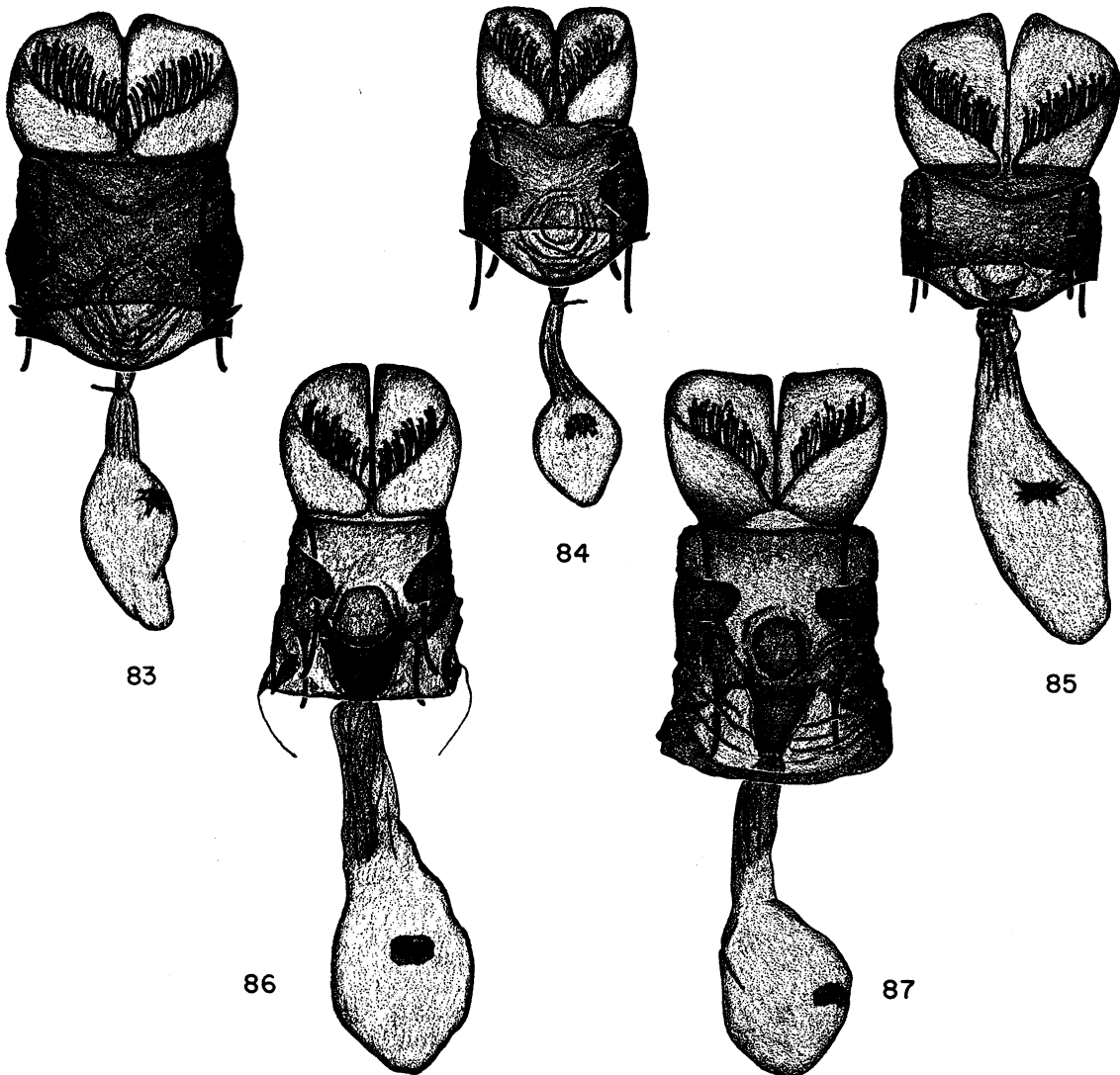
FIGS. 66-69. Male genitalia, showing right valve and aedeagus. 66. *Glaucina denticularia* (Dyar), Coyote Mountains, Arizona, August 3-7, 1916 (A.M.N.H.). 67. *G. imperdata* (Dyar), Karnes County, Texas, January 23, 1925 (A.M.N.H.). 68. *G. eureka eureka* (Grossbeck), Glendale, Utah, June 26, 1941 (G. H. and J. L. Sperry; A.M.N.H.). 69. *G. ochrofuscaria indistincta* (Grossbeck), Palm Springs, California, February 12, 1955 (A. H. Rindge; A.M.N.H.).



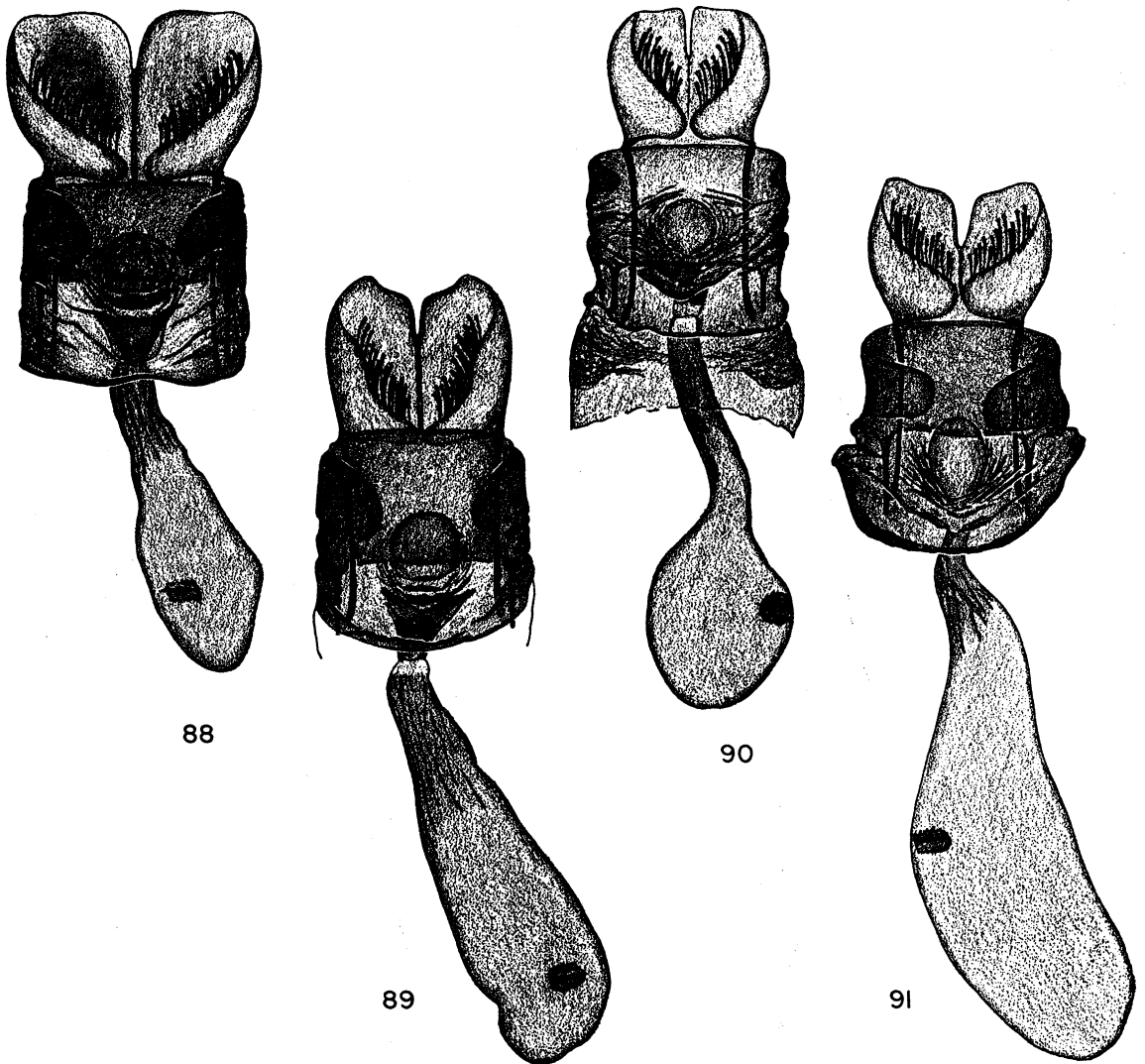
FIGS. 70-73. Male genitalia. 70. *Glaucina anomala* Rindge, right valve and aedeagus, holotype, Redington, Arizona (A.M.N.H.). 71. *Synglochis perumbraria* Hulst, Julian, California, August 16, 1913 (A.M.N.H.). 72. *Eubarnesia ritaria ritaria* (Grossbeck), Sabino Canyon, Arizona, August 18, 1950 (Cohn, Boone, Cazier; A.M.N.H.). 73. *Paraglaucina hulstinoides* (Grossbeck), holotype, La Puerta, California, October 14, 1911 (A.M.N.H.).



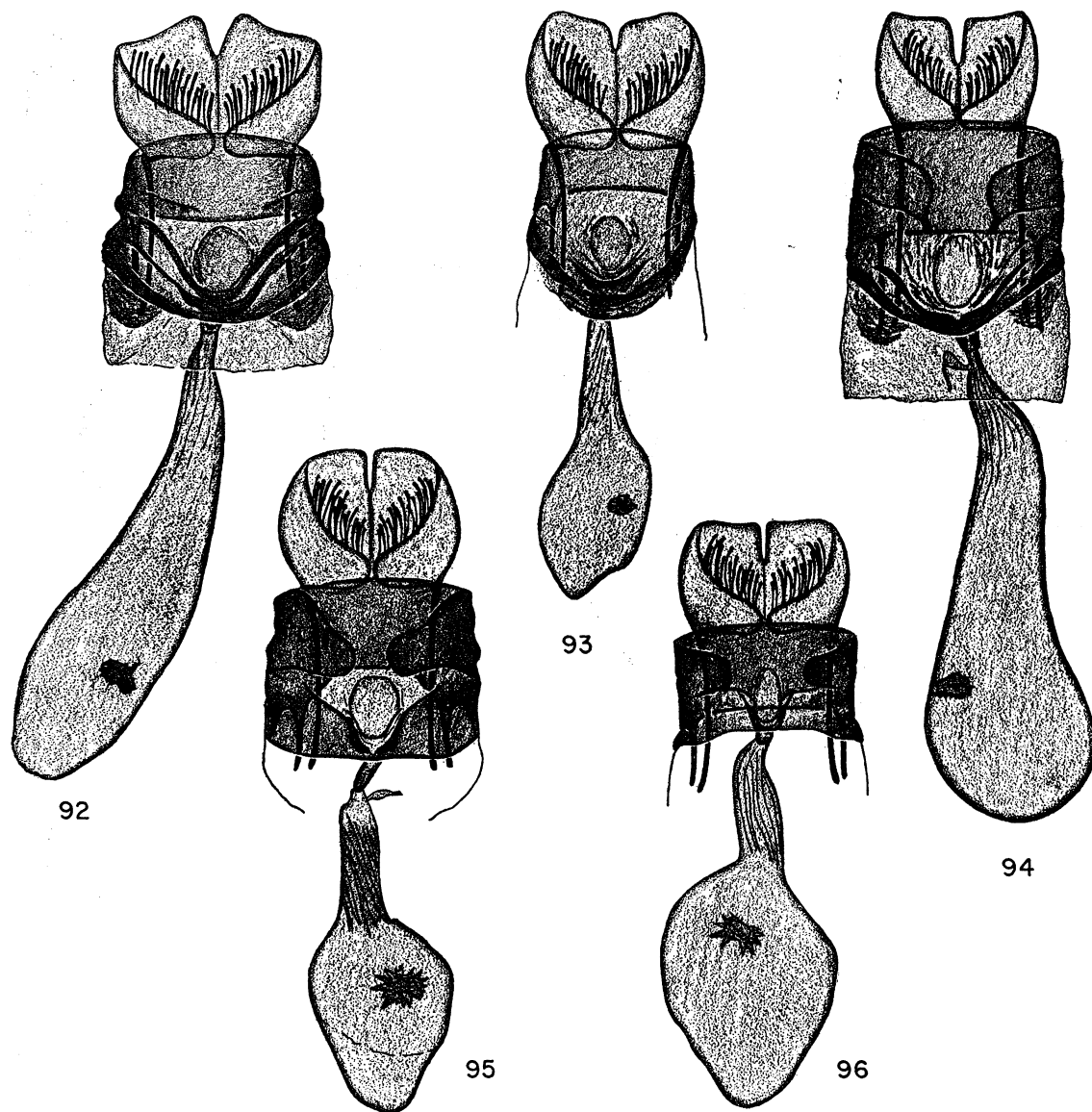
FIGS. 74-82. Female genitalia. 74. *Glauцина erroraria* Dyar, Borrego, California, May, 1948 (N. Crickmer; A.M.N.H.). 75. *G. biartata* Rindge, allotype, Santo Tomas, Baja California, July 8, 1953 (W. J. and J. W. Gertsch; A.M.N.H.). 76. *G. utahensis* (Cassino and Swett), Palm Springs, California, August 20, 1955 (A. H. Rindge; A.M.N.H.). 77. *G. macdunnoughi* (Grossbeck), Palm Springs, California, April 14, 1954 (A. H. Rindge; A.M.N.H.). 78. *G. epiphysaria* Dyar, Santo Tomas, Baja California, July 8, 1953 (W. J. and J. W. Gertsch; A.M.N.H.). 79. *G. baea* Rindge, paratype, Organ Pipe Cactus National Monument, Arizona, June 10, 1952 (Cazier, Gertsch, Schrammel; A.M.N.H.). 80. *G. escaria* (Grote), Baboquivari Mountains, Arizona, April 27, 1947 (G. H. and J. L. Sperry; A.M.N.H.). 81. *G. eupetheciaria eupetheciaria* (Grote), Wickenburg, Arizona, April 21, 1938 (G. H. and J. L. Sperry; A.M.N.H.). 82. *G. elongata* (Hulst), Nueces River, Texas, April 26, 1910 (Hunter and Pratt; U.S.N.M.).



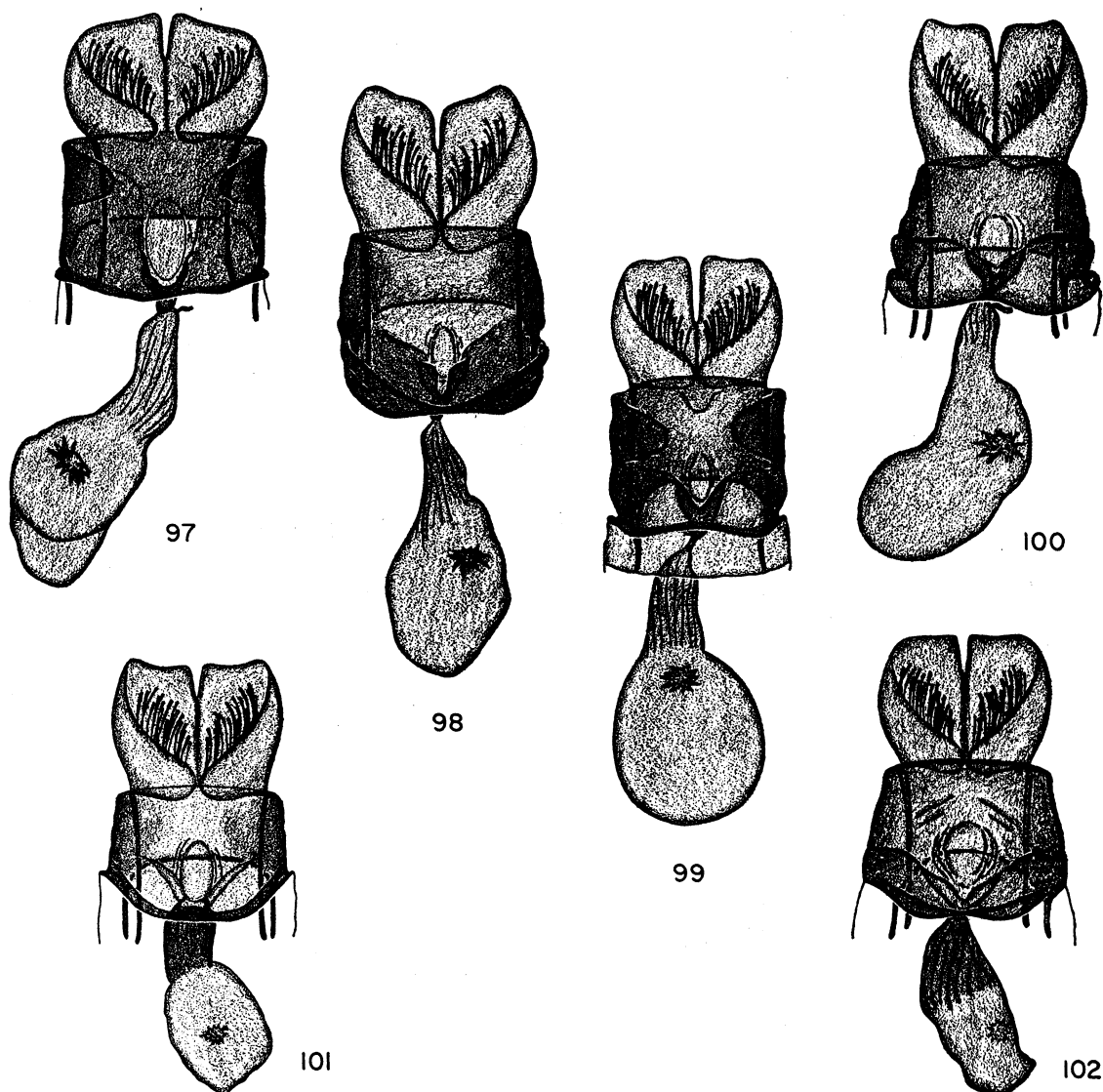
FIGS. 83-87. Female genitalia. 83. *Glaucina golgolata* (Strecker), Eureka, Utah, August 20, 1911 (T. Spalding; A.M.N.H.). 84. *G. magnifica* Grossbeck, San Diego, California, October 23, 1911 (Ricksecker; A.M.N.H.). 85. *G. ouden* (Dyar), Iguala, Guerrero, June, 1906 (U.S.N.M.). 86. *G. interruptaria interruptaria* (Grote), Redington, Arizona (A.M.N.H.). 87. *G. spaldingata* (Cassino and Swett), Eureka, Utah, May 10, 1910 (T. Spalding; A.M.N.H.).



FIGS. 88-91. Female genitalia. 88. *Glaucina gonia gonia* Rindge, allotype, Upper Santa Ana River, California, June 24, 1948 (G. H. and J. L. Sperry; A.M.N.H.). 89. *G. platia* Rindge, paratype, 2 miles north of Pinyon Flats, California, September 1, 1946 (A.M.N.H.). 90. *G. infumataria* (Grote), cotype, Texas, June 5 (Belfrage; B.M.N.H.). 91. *G. ignavaria* (Pearsall), Palmerlee, Arizona (A.M.N.H.).

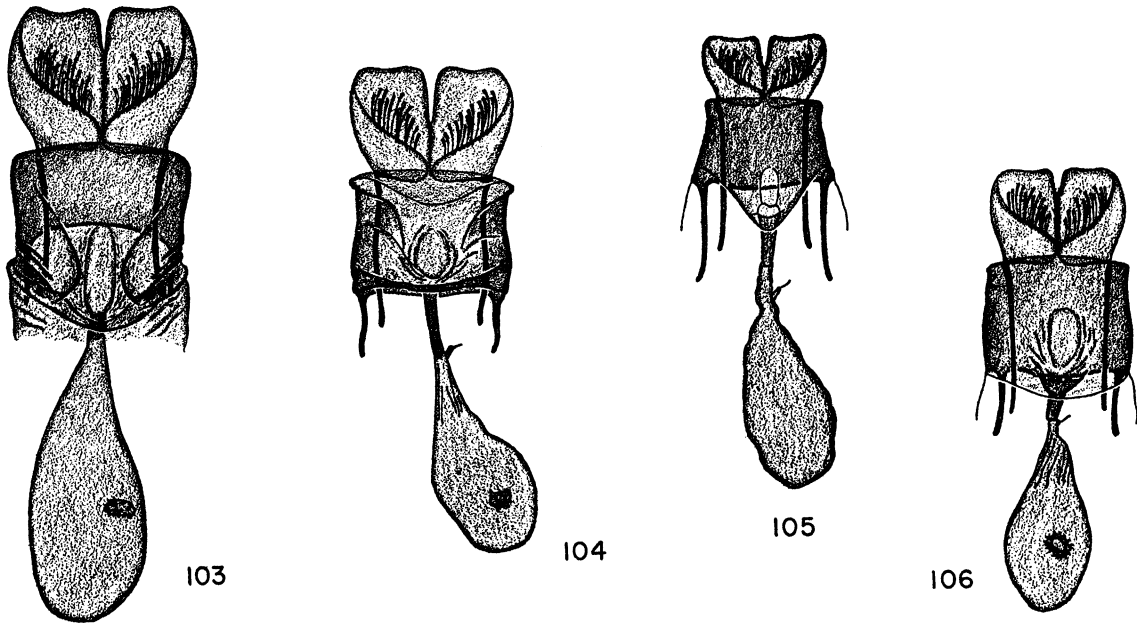


FIGS. 92-96. Female genitalia. 92. *Glaucina spina* Rindge, paratype, Mexico (A.M.N.H.). 93. *G. panda* Rindge, holotype, Actopan, Hidalgo, March 20, 1925 (C. C. Hoffmann; A.M.N.H.). 94. *G. foeminaria* (Dyar), holotype, Tehuacan, Puebla, September, 1909 (R. Muller; U.S.N.M.). 95. *G. lowensis* (Cassino and Swett), Santo Tomas, Baja California, July 8, 1953 (W. J. and J. W. Gertsch; A.M.N.H.). 96. *G. dispersa* Rindge, paratype, Jemez Springs, New Mexico, July 20 (A.M.N.H.).



FIGS. 97-102. Female genitalia. 97. *Glaucina nota* Rindge, paratype, Davis Mountains, Texas, September 7-30 (A.M.N.H.). 98. *G. denticularia* (Dyar), Chiricahua National Monument, Arizona, July 15, 1948 (C. and P. Vaurie; A.M.N.H.). 99. *G. imperdata* (Dyar), San Antonio, Texas (A.M.N.H.). 100. *G. eureka eureka* (Grossbeck), holotype, Eureka, Utah, May 31, 1910 (T. Spalding; A.M.N.H.). 101. *G. ochrofuscaria ochrofuscaria* (Grote), Phoenix, Arizona, September 3, 1908 (A.M.N.H.). 102. *G. loxa* Rindge, allotype, St. George, Utah (A.M.N.H.).





FIGS. 103-106. Female genitalia. 103. *Glaucina anomala* Rindge, paratype, Minas Nuevas, Sonora, August 7, 1952 (P. and C. Vaurie; A.M.N.H.). 104. *Synglochis perumbraria* Hulst, Parawan, Utah (A.M.N.H.). 105. *Eubarnesia ritaria ritaria* (Grossbeck), allotype, Santa Catalina Mountains, Arizona (A.M.N.H.). 106. *Paraglaucina hulstinoides* (Grossbeck), La Puerta, California, October 20, 1911 (A.M.N.H.).



**PLATES 23-27**

PLATE 23

1-4. *Glaucina erroraria* Dyar. 1. Male, Alamo Canyon, Ajo Mountains, Arizona, April 22, 1947 (G. H. and J. L. Sperry; A.M.N.H.). 2. Male, Palm Springs, Riverside County, California, March 25, 1953 (A. H. Rindge; A.M.N.H.). 3. Female, Mohawk, Arizona, April 30, 1947 (G. H. and J. L. Sperry; A.M.N.H.). 4. Female, Palm Springs, Riverside County, California, March 25, 1953 (A. H. Rindge; A.M.N.H.)

5, 6. *Glaucina biartata* Rindge. 5. Holotype, male, Rosario, Baja California, March 6, 1935 (A.M.N.H.). 6. Paratype, female, 2 miles east of San Simon, Baja California, September 8-9, 1955 (J. A. Comstock; L.A.M.)

7, 8. *Glaucina utahensis* (Cassino and Swett). 7. Male, New York Mountains, San Bernardino County, California, September 22, 1940 (C. Henne; L.A.M.). 8. Female, Palm Springs, Riverside County, California, April 26, 1957 (A. H. Rindge; A.M.N.H.)

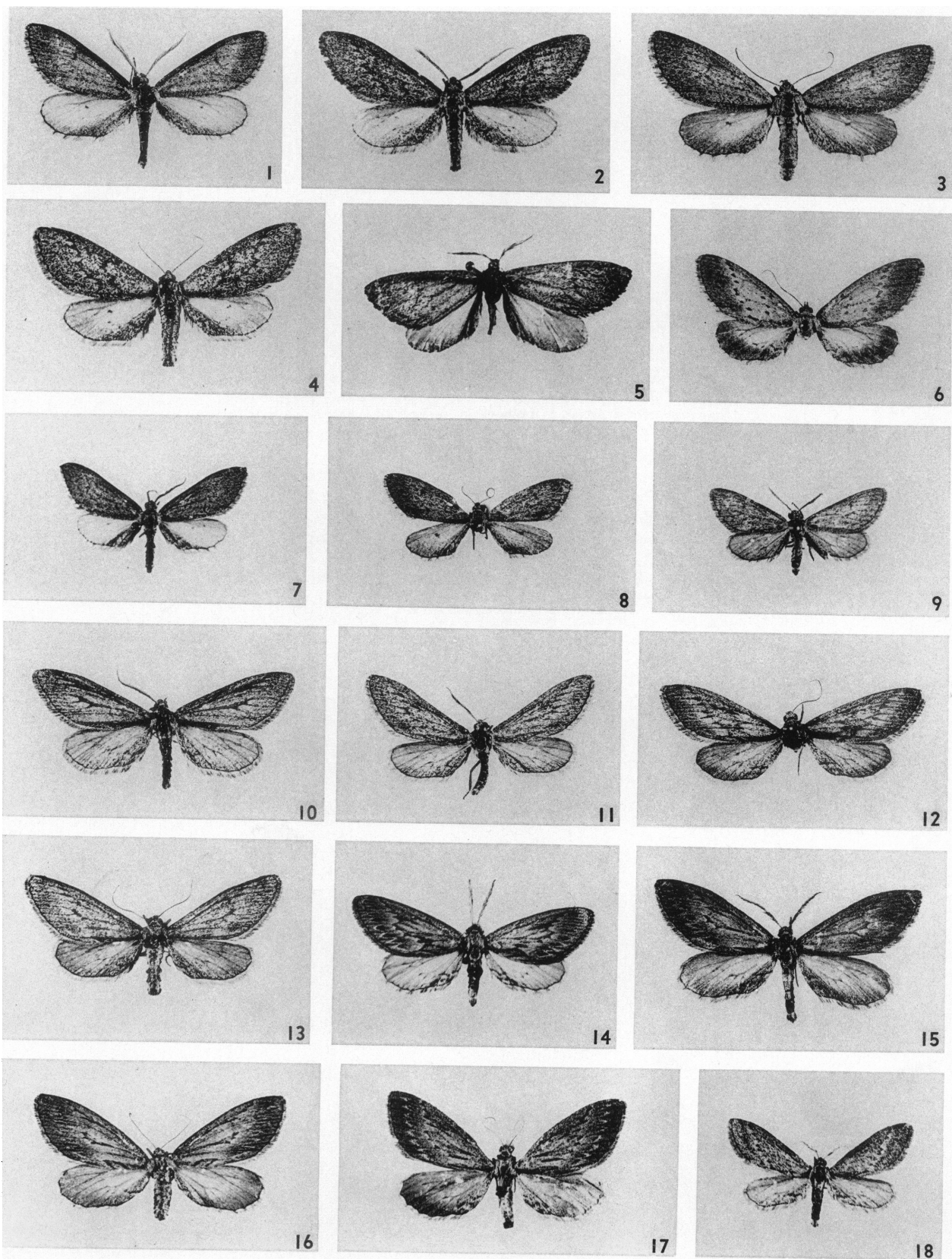
9. *Glaucina cilla* Rindge, paratype, male, Vidal, San Bernardino County, California, February 20, 1948 (R. Coleman; A.M.N.H.)

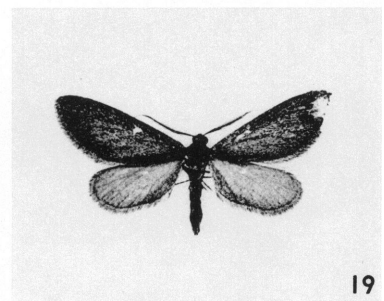
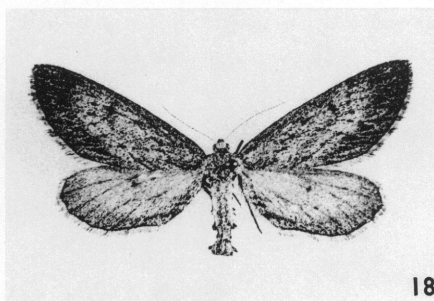
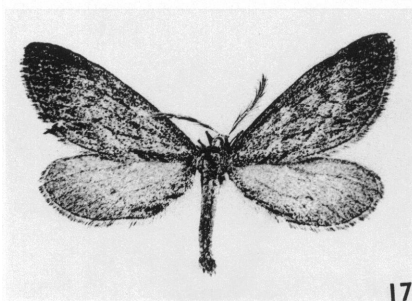
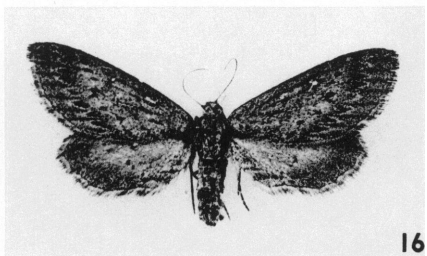
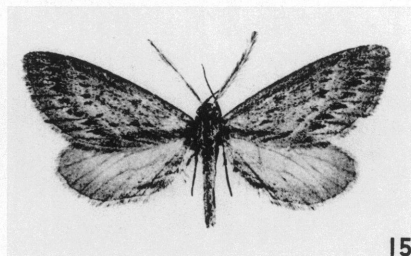
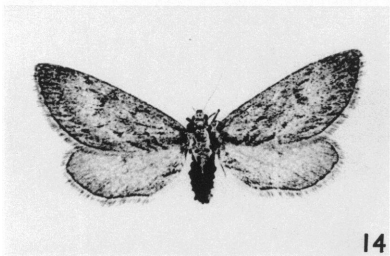
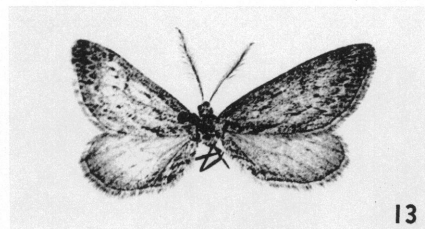
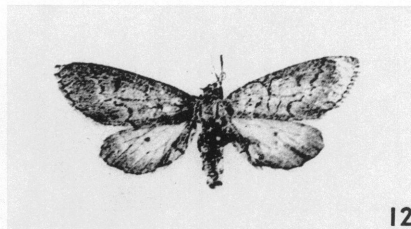
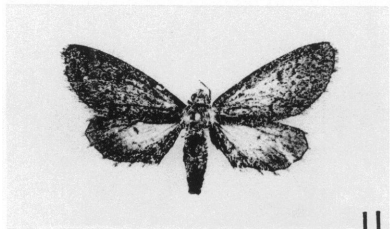
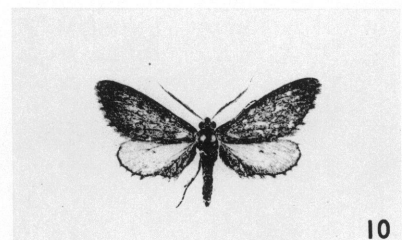
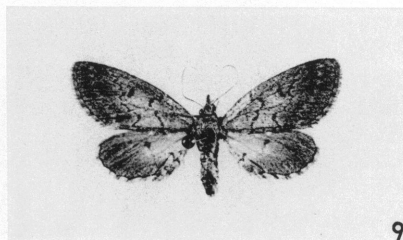
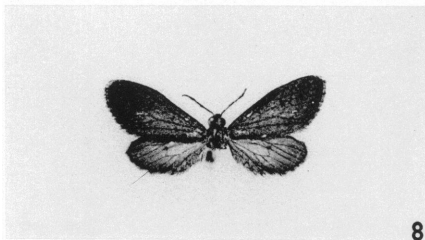
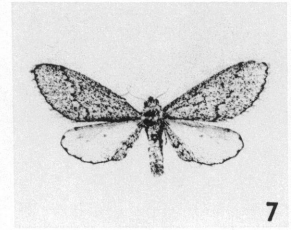
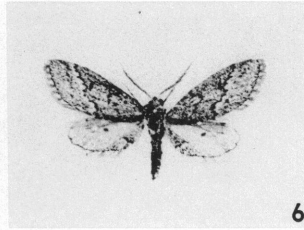
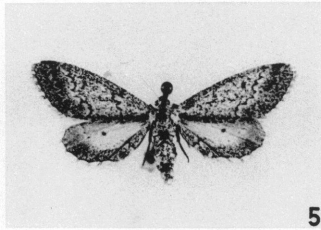
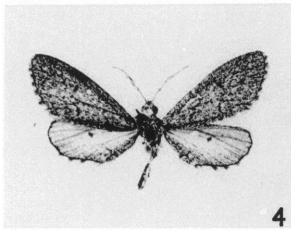
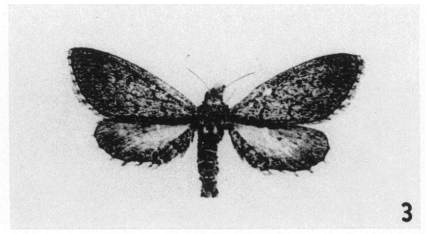
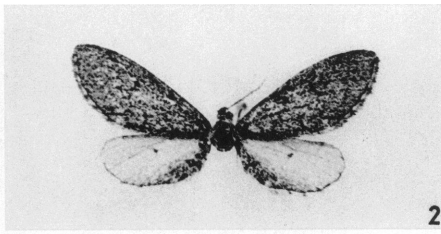
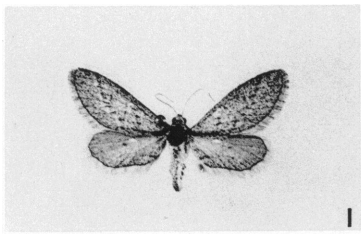
10-13. *Glaucina macdunnoughi* (Grossbeck). 10. Male, Morongo Valley, California, May 12, 1937 (G. H. and J. L. Sperry; A.M.N.H.). 11. Male, Tub Canyon, Borrego, California, January, 1947 (Crickmer; A.M.N.H.). 12. Female, Providence Mountains, California, May 11, 1936 (G. H. and J. L. Sperry; A.M.N.H.). 13. Female, Borrego, California, March 5, 1940 (G. H. and J. L. Sperry; A.M.N.H.)

14-17. *Glaucina epiphysaria* Dyar. 14. Male, San Diego, California, June 4, 1911 (Ricksecker; A.M.N.H.). 15. Male, Rancho La Sierra, Riverside County, California, May 1, 1952 (A. H. Rindge; A.M.N.H.). 16. Female, Riverside, California, April 3, 1935 (G. H. and J. L. Sperry; A.M.N.H.). 17. Female, Rancho La Sierra, Riverside County, California, May 30, 1946 (F. H. Rindge; A.M.N.H.)

18. *Glaucina baea* Rindge, paratype, male, Palm Desert, Riverside County, California, March 21, 1955 (A. H. and S. K. Rindge; A.M.N.H.)

All figures  $\times 1.5$





#### PLATE 24

1. *Glaucina baea* Rindge, paratype, female, Borrego, California, May 3, 1941 (G. H. and J. L. Sperry; A.M.N.H.)

2, 3. *Glaucina escaria* (Grote). 2. Male, Miami, Arizona, March 11, 1947 (L. H. Bridwell; A.M.N.H.). 3. Female, Madera Canyon, Santa Rita Mountains, Arizona, August 30, 1951 (Hill; A.M.N.H.)

4, 5. *Glaucina eupetheciaria eupetheciaria* (Grote). 4. Male, Gila Bend, Arizona, April 9, 1947 (Melander; A.M.N.H.). 5. Female, Aguila, Arizona, June 6, 1935 (G. H. and J. L. Sperry; A.M.N.H.)

6, 7. *Glaucina eupetheciaria lucida* Rindge. 6. Paratype, male, Palm Springs, Riverside County, California, April 18, 1957 (A. H. Rindge; A.M.N.H.). 7. Paratype, female, Palm Springs, Riverside County, California, April 6, 1957 (A. H. Rindge; A.M.N.H.)

8, 9. *Glaucina eupetheciaria osiana* (Druce). 8. Male, Alamos, Sonora, July 25 to August 7, 1953 (F. S. Truxal; L.A.M.). 9. Female, Alamos, Sonora, July 25 to August 7, 1953 (F. S. Truxal; L.A.M.)

10, 11. *Glaucina eupetheciaria escariola* Rindge. 10. Paratype, male, 18 miles north of Rodeo, Hidalgo County, New Mexico, July 7, 1956 (E. Ordway; A.M.N.H.). 11. Paratype, female, 13 miles north of Rodeo, Hidalgo County, New Mexico, June 16, 1956 (E. Ordway; A.M.N.H.)

12. *Glaucina elongata* (Hulst), female, Del Rio, Val Verde County, Texas, May 26, 1952 (Cazier, Gertsch, and Schrammel; A.M.N.H.)

13, 14. *Glaucina golgolata* (Strecker). 13. Male, Eureka, Utah, August 27, 1911 (T. Spalding; A.M.N.H.). 14. Female, Eureka, Utah, August 19, 1911 (T. Spalding; A.M.N.H.)

15, 16. *Glaucina magnifica* Grossbeck. 15. Male, San Diego, California, November 26, 1910 (Ricksecker; A.M.N.H.). 16. Female, San Diego, California, October 22, 1911 (Ricksecker; A.M.N.H.)

17, 18. *Glaucina ampla* Rindge. 17. Paratype, male, Upper Santa Ana River, San Bernardino County, California, August 26, 1948 (G. H. and J. L. Sperry; A.M.N.H.). 18. Paratype, female, Upper Santa Ana River, San Bernardino County, California, September 10, 1948 (G. H. and J. L. Sperry; A.M.N.H.)

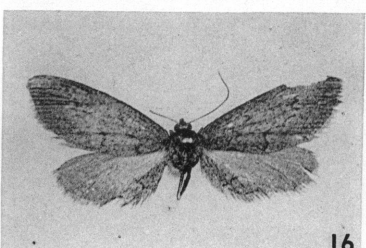
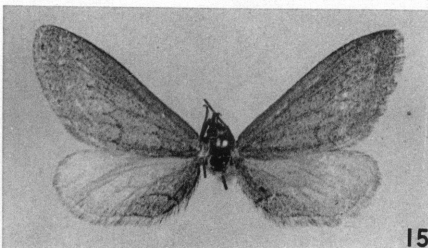
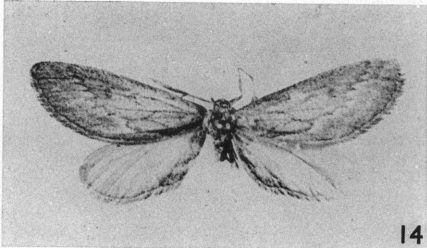
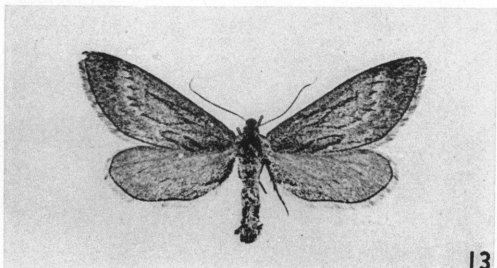
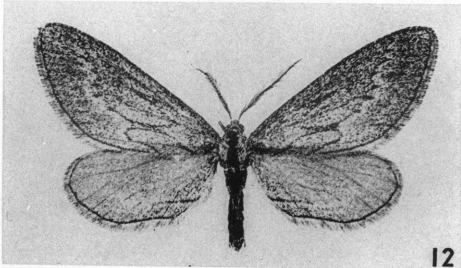
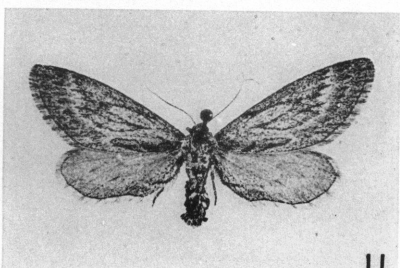
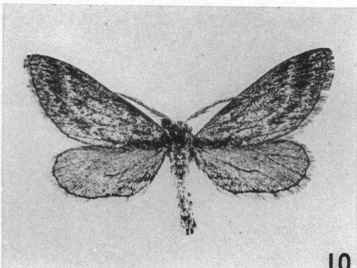
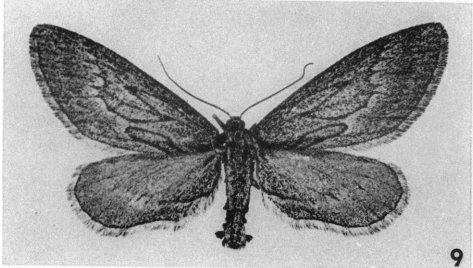
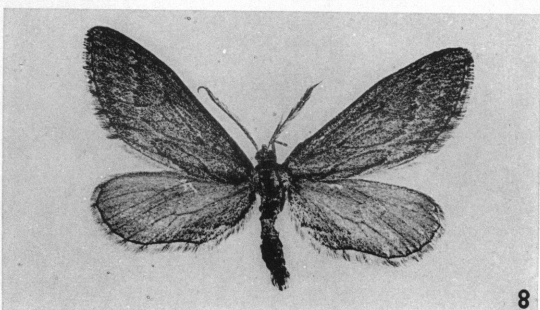
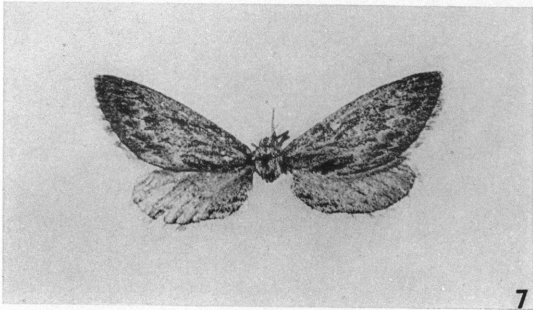
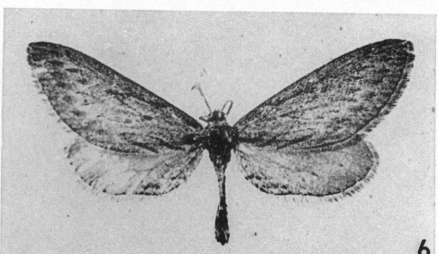
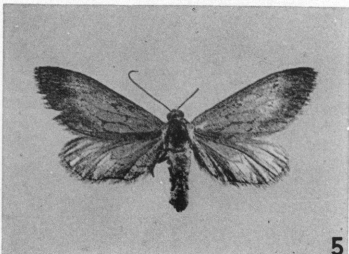
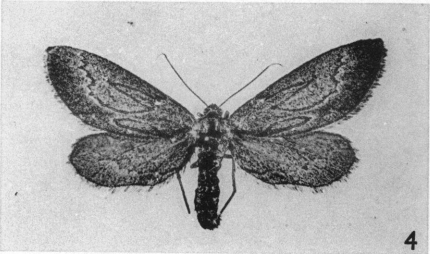
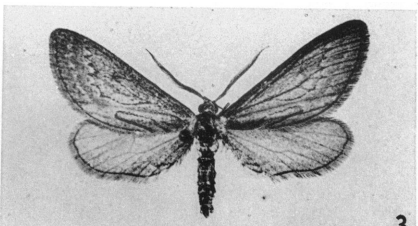
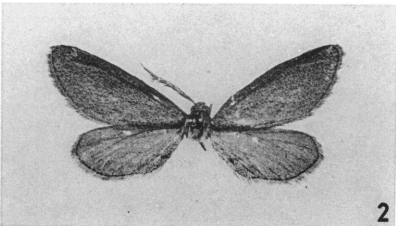
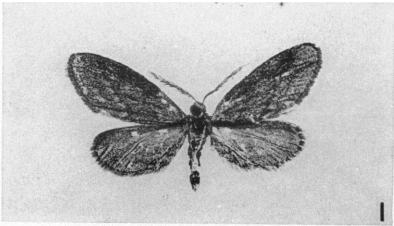
19. *Glaucina bifida* Rindge, paratype, male, Split Rock Tank, Mojave Desert, California, May 19, 1938 (G. H. and J. L. Sperry; A.M.N.H.)

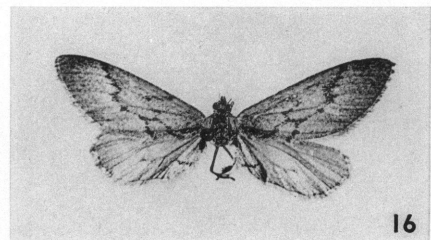
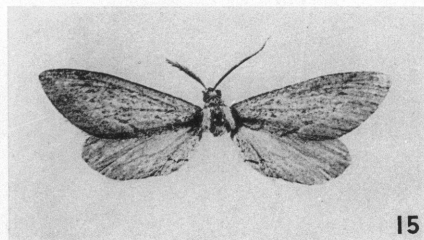
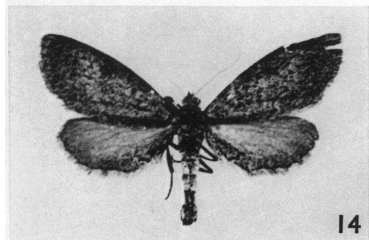
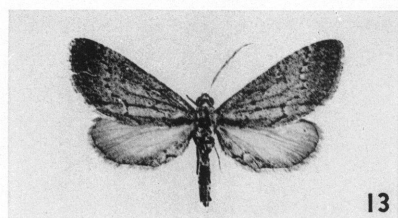
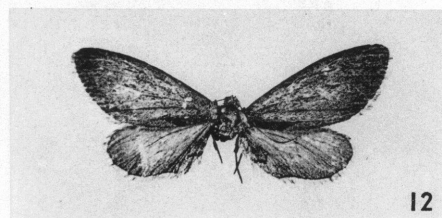
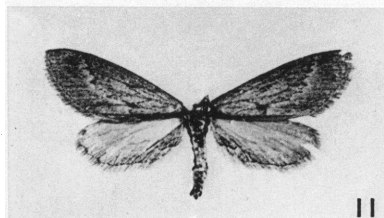
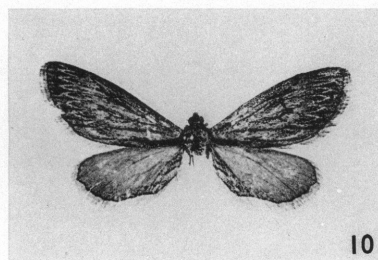
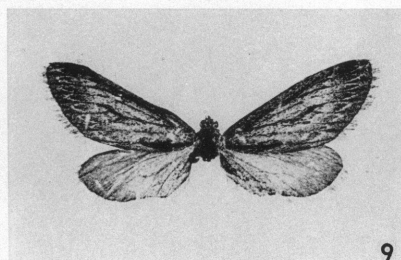
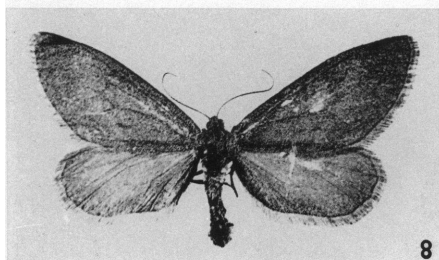
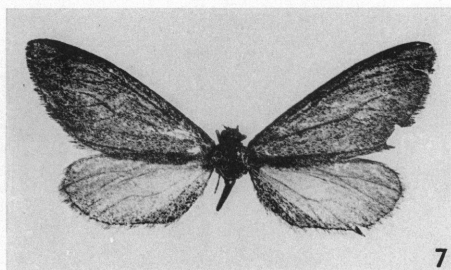
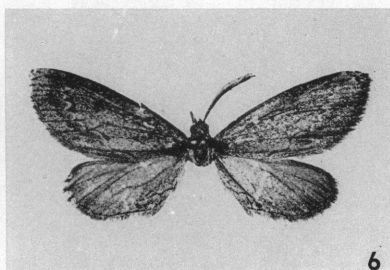
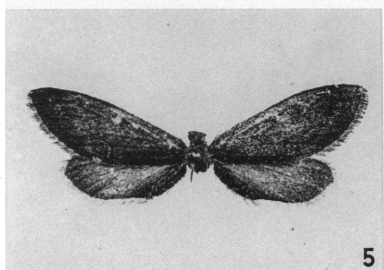
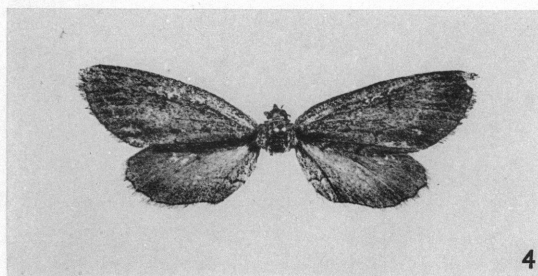
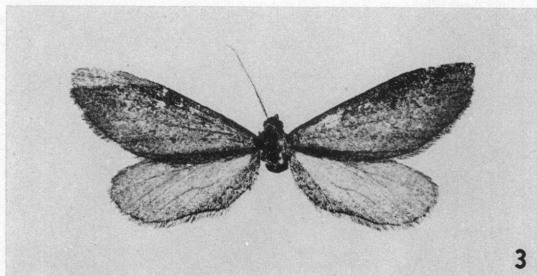
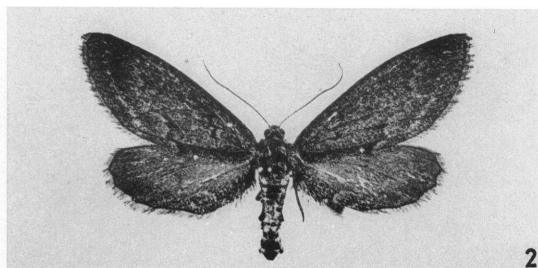
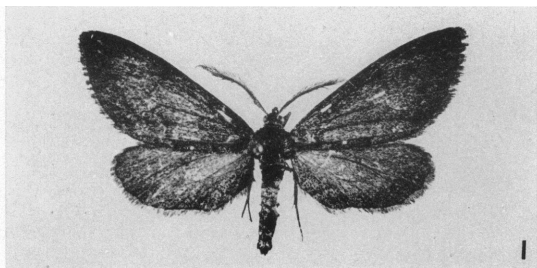
All figures  $\times 1.5$

PLATE 25

1. *Glaucina ouden* (Dyar), male, 7 miles south of Tumbiscatio, Michoacan, December 1, 1950 (R. F. Smith; A.M.N.H.)
  2. *Glaucina gertschi* Rindge, holotype, male, Matachic, Chihuahua, July 7, 1947 (W. J. Gertsch; A.M.N.H.)
  - 3, 4. *Glaucina interruptaria interruptaria* (Grote). 3. Male, Ramsey Canyon, Huachuca Mountains, Arizona, May 28-29, 1935 (J. A. Comstock; L.A.M.). 4. Female, near Nogales, Santa Cruz County, Arizona, August 25, 1954 (L. Martin; L.A.M.)
  5. *Glaucina interruptaria alboceptata* (Dyar), cotype, female, Cotulla, Texas, May 12, 1906 (Crawford and Pratt; U.S.N.M.)
  - 6, 7. *Glaucina spaldingata* (Cassino and Swett). 6. Male, Eureka, Utah, May 8, 1910 (T. Spalding; A.M.N.H.). 7. Female, Eureka, Utah, May 9, 1910 (T. Spalding; A.M.N.H.)
  - 8, 9. *Glaucina gonia gonia* Rindge. 8. Paratype, male, Barton Flats, San Bernardino County, California, June 31, 1946 (G. H. and J. L. Sperry; A.M.N.H.). 9. Paratype, female, Upper Santa Ana River, San Bernardino County, California, June 29, 1948 (G. H. and J. L. Sperry; A.M.N.H.)
  - 10, 11. *Glaucina gonia microgonia* Rindge. 10. Paratype, male, Independence, Inyo County, California, May 14, 1936 (L. Martin; L.A.M.). 11. Paratype, female, Independence, Inyo County, California, May 14, 1936 (L. Martin; L.A.M.)
  - 12, 13. *Glaucina platia* Rindge. 12. Paratype, male, Inyo Mountains, Inyo County, California, May 11, 1936 (R. H. Andrews and L. Martin; L.A.M.). 13. Paratype, female, Argus Mountains, Inyo County, California, May 27, 1937 (L. Martin; L.A.M.)
  14. *Glaucina nephos* Rindge, paratype, male, Colorado (A.M.N.H.)
  - 15, 16. *Glaucina infumataria* (Grote). 15. Male, Texas, March 4 (Belfrage; A.M.N.H.). 16. Cotype, female, Texas, June 5 (Belfrage; B.M.N.H.)
- All figures  $\times 1.5$







## PLATE 26

1, 2. *Glaucina ignavaria* (Pearsall). 1. Male, Upper Camp, Pinery Canyon, Chiricahua Mountains, Arizona, July 5, 1956 (Martin, Comstock, and Rees; L.A.M.). 2. Female, Upper Camp, Pinery Canyon, Chiricahua Mountains, Arizona, July 5, 1956 (Martin, Comstock, and Rees; L.A.M.)

3, 4. *Glaucina spina* Rindge. 3. Paratype, male, Mexico City, Mexico, June, 1919 (R. Muller; U.S.N.M.). 4. Paratype, female, Mexico (A.M.N.H.)

5. *Glaucina panda* Rindge, holotype, female, Actopan, Hidalgo, March 20, 1925 (C. C. Hoffmann; A.M.N.H.)

6. *Glaucina foeminaria* (Dyar), male, 16 kilometers southwest of Zapotitlan de las Salinas, Puebla, May 17, 1952 (Dawson; A.M.N.H.)

7, 8. *Glaucina lowensis* (Cassino and Swett). 7. Male, Guatay, San Diego County, California, July 9, 1953 (W. J. and J. W. Gertsch; A.M.N.H.). 8. Female, Smoky Valley, Tulare County, California, June 12, 1949 (G. H. and J. L. Sperry; A.M.N.H.)

9, 10. *Glaucina dispersa* Rindge. 9. Paratype, male, Jemez Springs, New Mexico, September 1 (A.M.N.H.). 10. Paratype, female, Jemez Springs, New Mexico, July 16 (A.M.N.H.)

11, 12. *Glaucina nota* Rindge. 11. Paratype, male, Brewster County, Texas, June-July, 1929 (A.M.N.H.). 12. Paratype, female, Davis Mountains, Texas, September 1-3 (A.M.N.H.)

13, 14. *Glaucina denticularia* (Dyar). 13. Male, Paradise, Arizona, August 14, 1907 (A.M.N.H.). 14. Female, Madera Canyon, Santa Rita Mountains, Arizona, August 25, 1946 (Comstock and Martin; L.A.M.)

15, 16. *Glaucina imperdata* (Dyar). 15. Male, Karnes County, Texas, January 23, 1925 (C. Kircher; A.M.N.H.). 16. Female, Karnes County, Texas, January 19, 1925 (A.M.N.H.)

All figures  $\times 1.5$

PLATE 27

1,2. *Glaucina eureka eureka* (Grossbeck). 1. Male, Glendale, Utah, June 16, 1941 (G. H. and J. L. Sperry; A.M.N.H.). 2. Female, south of Tropic, Utah, July, 1949 (Crickmer; A.M.N.H.)

3,4. *Glaucina eureka agnesae* Rindge. 3. Paratype, male, Palm Springs, Riverside County, California, April 4, 1945 (F. H. Rindge; A.M.N.H.). 4. Paratype, female, Borrego, California, February 26, 1950 (G. H. and J. L. Sperry; A.M.N.H.)

5,6. *Glaucina ochrofuscaria ochrofuscaria* (Grote). 5. Cotype, male, of *obscura*, southern Arizona, September, 1900 (Poling; A.M.N.H.). 6. Female, Tucson, Pima County, Arizona, March 6, 1956 (E. J. Davis; A.M.N.H.)

7,8. *Glaucina ochrofuscaria indistincta* (Grossbeck). 7. Male, Borrego, California. December, 1945 (Crickmer; A.M.N.H.). 8. Female, Split Mountain Canyon, San Diego County, California, April 12, 1939 (G. H. and J. L. Sperry; A.M.N.H.)

9. *Glaucina loxa* Rindge, paratype, female, Saint George, Utah (A.M.N.H.)

10,11. *Glaucina anomala* Rindge. 10. Holotype, male, Redington, Arizona (A.M.N.H.). 11. Paratype, female, 10 miles west of Alamos, Sonora, July 21, 1954 (G. M. Bradt; A.M.N.H.)

12,13. *Synglochis perumbraria* Hulst. 12. Male, Palm Springs, Riverside County, California, March 23, 1953 (A. H. Rindge; A.M.N.H.). 13. Female, Palm Desert, Riverside County, California, March 15, 1954 (A. H. and S. K. Rindge; A.M.N.H.)

14,15. *Eubarnesia ritaria ritaria* (Grossbeck). 14. Male, El Mirador Ranch, Baboquivari Mountains, Arizona, September 3, 1950 (Cohn, Boone, and Cazier; A.M.N.H.). 15. Female, Quinlan Mountains, Arizona, May 22, 1937 (G. H. and J. L. Sperry; A.M.N.H.)

16,17. *Eubarnesia ritaria arida* Rindge. 16. Paratype, male, Tub Canyon, Borrego, California, December, 1951 (Crickmer; A.M.N.H.). 17. Paratype, female, Tub Canyon, Borrego, California, December, 1951 (Crickmer; A.M.N.H.)

18,19. *Paraglaucina hultinoides* (Grossbeck). 18. Cotype, male, La Puerta, California, October 19, 1911 (A.M.N.H.). 19. Female, Tub Canyon, Borrego, California, November, 1947 (Crickmer; A.M.N.H.)

All figures  $\times 1.5$



