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FREDERICK H. RINDGE
Curator, Department of Entomology
The American Museum of Natural History

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ABSTRACT

THE GEOMETRID MOTHS heretofore assigned to the genera *Mericisca* Hulst, *Tracheops* Hulst, *Parapheromia* McDunnough, and *Merisma* McDunnough were studied from the United States. The Mexican fauna was also examined for species that belong to this group. These studies show that the above four groups are not distinct on a generic level, even though each one forms a small and compact group of species. Consequently they have been placed as subgenera of *Mericisca*. In addition, it was necessary to erect the new subgenus *Puebla* for two Mexican species.

The moths assigned to *Mericisca* are distributed from Wyoming and the southern Rocky Mountain states and western Texas in the United States, south in the temperate, mountainous regions of Mexico as far as the State of Chiapas and vicinity. A total of 24 species are included in this genus. Nine are described in this revision as new; of these, eight are from Mexico and one is from Arizona and New Mexico.

The genus, all subgenera, and each species are described; distributional information is given for all species insofar as known. Keys are given for all subgenera and species. The adults and their genitalia are figured.

INTRODUCTION

THE PRESENT PAPER is the tenth in a continuing series of revisionary studies of the genera of the New World Cleorini (McDunnough, 1920), or Boarmini (Forbes, 1948), of the subfamily Ennominae. Both these names refer to a very large tribe of "inch worm" moths that are widely distributed in the temperate and tropical regions of the Old World and the New. The adults often rest on tree trunks, with their wings outspread and appressed to the bark. The wings are usually brown or gray, with a pattern that makes the moths almost invisible.

The species included in this revisionary study occur mainly in the southwestern United States (Wyoming, Colorado, Utah, Arizona, New Mexico, and western Texas) and in the temperate regions of Mexico as far south as the State of Chiapas and vicinity. In the United States, the species are placed in the following genera: *Mericisca* Hulst, *Tracheops* Hulst, *Parapheromia* McDunnough, and *Merisma* McDunnough (McDunnough 1938). The described Mexican species were named in several genera, but none was included in the above. McDunnough (1920) revised the group from the United States; no one has done any systematic studies of the Mexican moths. In the present paper I attempt to revise taxonomically all the moths included in this group, and to try to answer some of the questions pertaining to the systematics and distribution of the group.

The first question is whether or not the above-mentioned genera are valid and, if so, how they should be defined. This has proved to be a difficult task as many of the usual criteria for defining genera in the Cleorini have not been of particular value. Some of the characters that are being considered are given in table 1 for these groups, as well as for one new group described herein.

Hulst published *Mericisca* and *Tracheops* in his 1896 revision of the Geometridae, and included but one species in each; he must not have thought them to be particularly closely related as they were described 10 pages apart. The forelegs of the type specimen of *Tracheops bolteri* Hulst were lacking when the species was described, as the spinose projection from the tibia was not mentioned; this character would undoubtedly have been used as being of generic value as it is one of the few unique characters of *Tracheops*, but alone this character is not enough to maintain *Tracheops* as a distinct genus.

When McDunnough (1920) published his revision of the Cleorini, he proposed *Parapheromia* and *Merisma*. He stated that the former genus was closely allied to *Mericisca* but that it differed primarily by having a hair pencil on the hind tibia of the male and by the absence of the gnathos in the male genitalia. Some of my recent studies in this tribe have shown that the hair pencil may be present or absent within a given

TABLE 1
OCCURRENCE OF CHARACTERS

	Mericisca	*Puebla*	*Parapheromia*	*Merisma*	*Tracheops*
♂ antennae, number of segments	55–58	61–76	45–51	58–60	58
♀ antennae:					
Simple	+	+	+	+	—
Serrate	+	—	—	+	+
Forewing venation:					
12 veins	+	+	+	+	+
11 veins	—	—	+	+	—
Areole	±	±	±	±	+
Spinose projection from fore tibia	—	—	—	—	+
♂ hind tibial hair pencil	—	+	+	+	—
Row of setae on A_3	—	+	+	+	—
Gnathos	+	+	—	+	+
Ornamentation of valves:					
Two large spinose areas	+	+	+	—	—
Small setose costal patch	—	+	—	+	—
Unornamented	—	—	—	+	+
Vesica:					
Unarmed	—	—	+	—	—
Slender sclerotized bands	+	—	—	—	—
Single spine	—	—	—	+	—
Spine plus paired plates	—	—	—	+	+
Large spinulose area	—	+	—	—	—
Sterigma:					
Sclerotized lateral plates	+	+	+	—	—
Sclerotized, elongate median area	—	+	—	—	—
Sclerotized, rounded median area	—	—	—	+	+
Posterior portion of corpus bursae:					
Straight	+	—	+	—	+
Curved	—	+	—	+	—

Symbols: +, character present; ±, character present or absent; —, character absent.

genus and, as such, is probably of more importance as a specific than a generic character (Rindge, 1965, 1966, 1967, 1968, 1970). In the species considered in this paper and in those just cited, the presence of a row of setae on the ventral surface of the third abdominal segment is directly correlated with the presence of the tibial hair pencil, as this dual combination appears to be a sex-linked character. This leaves the absence of the gnathos to be considered. In certain dissections it is possible to locate this structure, but it certainly is not the prominent, heavily sclerotized organ that it is in the other groups under consideration. However, the apparent lack of the gnathos by itself is not considered to be a character of generic value.

Merisma was originally differentiated by the shorter pectinations of the male antennae, by the fact that vein R_1 of the forewings anastomoses with Sc and then separates distally, and by the reduction of the armature of the valves; it was known only from *spododea* Hulst, the type species, when the genus was proposed. Since then additional species have been described in this genus, and more will be added in the present paper. As a result of these studies the shorter pectinations of the male antennae are shown to be a specific character, the venational difference proves to be of little value, and a similar type of reduction of the armature of the valves is also to be found in *Tracheops*.

In summary, it appears that these four groups really are not distinct on a generic level, even though each one forms a small and compact group of species. In this paper, then, these are considered as subgenera, with the entire group

being known as *Mericisca* Hulst. In addition, it has been found necessary to erect one new subgenus for two Mexican species.

The arrangement of the species into the five subgenera outlined above may need further refinement as additional information becomes available. At the present time, nothing has been published on either the early stages or the food plants for any of the included species. A study of the chromosomes might produce some extremely important data that would be of great assistance in this regard. Information from these and other fields is needed as an aid in working with these moths.

The genus *Mericisca*, as defined in this revision, contains 24 species, all of which are monotypic. Nine are proposed as new herein, and all but one of these are described from Mexico.

Almost 2500 specimens and 200 genitalic dissections have been studied during the preparation of this paper; of these, about 60 percent of the specimens and 70 percent of the dissections are in the collection of the American Museum of Natural History.

The ratios of captured males to females in the different subgenera of *Mericisca* is variable; this information is summarized in table 2. Data for the individual species are given under Remarks at the end of each specific description.

TABLE 2
RATIO OF MALES TO FEMALES

Subgenus	Males	Females	Ratio
Mericisca	602	128	4.7:1
Puebla	8	2	4:1
Parapheromia	574	93	6.1:1
Merisma	562	207	2.7:1
Tracheops	196	114	1.7:1

MATERIALS AND METHODS

The present revision is based on a study of the collections of the American Museum of Natural History, the California Academy of Sciences, the Los Angeles County Museum of Natural History, the Museum of Comparative Zoology, Harvard University, and the National Museum of Natural History, Smithsonian Institution. Material from the private collections of several individuals has also been examined; these are referred to specifically under Acknowledgments.

All specimens studied by the author at the American Museum of Natural History during the preparation of this paper have had identification or type labels affixed. All too often in the past, such labeling has not been done so that the question invariably arises as to whether certain specimens were examined by a reviser.

The specimens 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. When such a procedure was not practical, the fact is specifically noted.

The following abbreviations have been used:

AMNH, the American Museum of Natural History
CNC, the Canadian National Collection, Ottawa, Ontario
LAM, Los Angeles County Museum of Natural History
MCZ, Museum of Comparative Zoology, Harvard University
RHL, R. H. Leuschner, Gardena, California
USNM, National Museum of Natural History, Smithsonian Institution.

A large number of genitalic preparations was made by the author, who also had at his disposal the slides made by J. H. Sperry at the American Museum of Natural History, by J. H. McDunnough at the Canadian National Collection, by H. W. Capps, D. C. Ferguson, and E. L. Todd at the National Museum of Natural History, by S. E. Cassino and L. W. Swett at the Museum of Comparative Zoology at Harvard University, and by C. W. Kirkwood.

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T. Escalante of Mexico City, Mexico; Mr. C. W. Kirkwood of Summerland, California; and Mr. R. H. Leuschner of Gardena, California.

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SYSTEMATIC DESCRIPTIONS

GENUS *MERICISCA* HULST

Mericisca HULST, 1896, p. 356.

DIAGNOSIS: The members of this genus can be distinguished from the other North American Cleorini by the nature of the antennae. The males have bipectinate antennae, with the apex simple; the point of origin of each pair of pectinations varies from the middle to the end of the segment. Each pectination tends to be relatively short and thick, remaining straight instead of becoming twisted as in other genera, with a double row of very long setae down the underside of each pectination but without an elongate terminal seta. The female antennae are either simple or weakly serrate.

ADULTS: Head with eyes large, round; front either level with eyes or raised, with or without low dorsolateral rim, central area either flat and smoothly sclerotized or with weak median ridge and punctate surface; tongue well developed; palpi porrect, small, just reaching or barely extending beyond scaling of front, antennae of male with about 45 to 76 segments; of females of equal number or with four or five fewer segments; male antennae bipectinate, with terminal portion simple, pectinations tending to be rather short, thick, and straight, arising from between middle to end of each segment, with double row of very long setae on under surface of each pectination, and without single terminal seta; female antennae either simple or weakly serrate. Thorax with small posterior tufts; fore tibia either unarmed or with terminal spinose projection, with process of both sexes arising near middle of, and extending to, end of tibia; hind tibia with two pairs of spurs, males with or without hair pencil and groove. Abdomen without crests or tufts; male with or without row of setae on ventral surface of third segment, last segment unmodified. Forewings broad, varying from elongate to broad, alike in both sexes; venation variable, with either 12 or 11 veins present, and areole present or absent; R_1 variable, separate, joining with Sc, or united with R_2, R_5 from stalk about midway to branching of R_3 and R_4; M_1 from upper angle; dc weakly curved or almost straight; Cu_1 from just basad of lower angle; fovea absent. Hind wings broad, outer margin smooth or weakly concave between veins; frenulum strong in both sexes; Sc approximate to R for one-third to one-half length of cell; R and M_1 from before upper angle, or with only R before angle; M_3 from lower angle; Cu_1 from near lower angle.

Upper surface of wings variable in color and maculation, with cross lines of forewings usually represented; hind wings either similar to forewings or paler and with greatly reduced maculation. Under surface gray or grayish brown, with reduced maculation.

MALE GENITALIA: Uncus varying from broadly triangular or bell-like, with wide base and slender apex, to elongate, apical portion more or less flattened and wide; socius usually absent, but present in one subgenus; gnathos usually large, heavily sclerotized, with prominent median enlargement, but absent in one subgenus; valves symmetrical, extending to or beyond apex of uncus, with sclerotized costa, inner face simple or variably ornamented, and sacculus more or less sclerotized; transtilla with membranous connection between enlarged and anteriorly pointed bases of costa; anellus with broad base, and variously shaped, elongate, usually narrow, posterior extension; cristae present, elongate, inconspicuous; tegumen and saccus broad, deep, heavily sclerotized; aedeagus straight, slender, varying in length from being shorter than to longer than combined lengths of uncus, tegumen, and saccus; vesica small, unarmed, having single spine, with or without small paired sclerotized plates in addition, or having spinulose area.

FEMALE GENITALIA: Papillae anales simple, membranous, scarcely distinguishable from adjacent membranous area, moderately to very lengthily exsertile, with apophyses posteriores two to three times longer than apophyses anteriores, being from 2.0 to 9.6 mm. in length; sterigma variable, some subgenera with large, lateral, sclerotized plates, others with only median, rounded, sclerotized area, and one subgenus with lateral plates and elongate, slender, median process; ductus bursae small, varying from being slender and twice as long as wide, to short and wider than long; ductus seminalis usually arising ventrally from near anterior end of ductus bursae, rarely from tapering projection

on right side posterodorsally of corpus bursae; latter moderate to very long, in many cases occupying almost entire length of abdomen, slender, with anterior end usually enlarged; signum present, usually small, margin with differently shaped ornamentation, situated dorsally or ventrally.

EARLY STAGES: Unknown.

FOOD PLANTS: Unknown.

TYPE SPECIES: *Mericisca gracea* Hulst; by original designation.

DISTRIBUTION: Wyoming, the southern Rocky Mountain states, and western Texas in the United States, and the temperate regions of Mexico as far south as the State of Chiapas.

KEY TO SUBGENERA

BASED ON EXTERNAL CHARACTERS

1. Fore tibia with elongate, terminal spinose projection . . . . . *Tracheops* (p. 402)
   Fore tibia without spinose projection 2
2. Hind tibia of male with hair pencil 3
   Hind tibia of male without hair pencil . . . . . *Mericisca* (p. 350)
3. Antennae with from 45 to 51 segments . . . . . *Parapheromia* (p. 369)
   Antennae with from 58 to 76 segments 4
4. Male antennae with from 58 to 60 segments, and with longest pectinations one and one-half to two times longer than each basal segment . . . . . *Merisma* (p. 387)
   Male antennae with from 61 to 76 segments, and longest pectinations three-fourths to one and one-half length of each basal segment . . . . . *Puebla* (p. 364)

BASED ON MALE GENITALIA AND SECONDARY SEXUAL CHARACTERS

1. Inner surface of valves with two large spinose areas 2
   Inner surface of valves either unornamented or with small setose costal patch 4
2. Gnathos large, heavily sclerotized 3
   Gnathos apparently absent . *Parapheromia* (p. 369)
3. Abdomen with row of setae on ventral surface of third segment . . . . . *Puebla* (p. 364)
   Abdomen without row of setae on ventral surface of third segment . . . . . *Mericisca* (p. 350)
4. Abdomen with row of setae on ventral surface of third segment . . . . . *Merisma* (p. 387)
   Abdomen without row of setae on ventral surface of third segment . . . . . *Tracheops* (p. 402)

BASED ON FEMALE GENITALIA

1. Sterigma with large, sclerotized lateral plates . 2
   Sterigma without lateral plates but with sclerotized, rounded median area. 4
2. Apophyses posteriores 3.3 to 9.6 mm. in length . 3
   Apophyses posteriores 2.0 to 2.9 mm. in length . . . . . *Parapheromia* (p. 369)
3. Apophyses posteriores 3.3 to 4.2 mm. in length . . . . . *Mericisca* (p. 350)
   Apophyses posteriores about 9.6 mm. in length . . . . . *Puebla* (p. 364)
4. Corpus bursae with narrowed posterior portion curved . . . . . *Merisma* (p. 387)
   Corpus bursae with narrowed posterior portion straight . . . . . *Tracheops* (p. 402)

SUBGENUS *MERICISCA* HULST, NEW STATUS

Mericisca HULST, 1896, p. 356. DYAR, "1902" [1903], p. 325. SMITH, 1903, p. 77. BARNES AND MCDUNNOUGH, 1917, p. 118. MCDUNNOUGH, 1920, p. 16; 1938, p. 163.

DIAGNOSIS: The antennae of the males have their longest pectinations 0.3 to 0.4 mm. in length; the female antennae are simple. The male genitalia have two large spinose areas on the inner face of the valves, and a prominent gnathos. The female genitalia have the sterigma with sclerotized lateral plates and a very long, straight corpus bursae.

ADULTS: Head with front level with eyes, with or without low dorsolateral rims, and flat, smoothly sclerotized central area; antennae of male with from about 55 to 58 segments, terminal 10 to 12 simple, longest pectinations one and one-half to two times as long as their basal segments, and from 0.3 to 0.4 mm. in length; antennae of female simple or shortly serrate. Thorax with foreleg not having spinose projection; hind leg of male without hair pencil and groove. Abdomen without row of setae in male on ventral surface of third segment. Forewings with 12 veins, with or without areole, and R_1 separate, arising at common point with, or stalked, with R_2.

MACULATION: Of two types: one with prominent, complete cross lines on upper surface of wings, with distinct pattern; the second with barely discernible cross lines and even, overall pattern.

MALE GENITALIA: Uncus triangular, tapering to point or rounded apex; socius absent; gnathos heavily sclerotized, with moderate median enlargement; valves with apical setose area, with two, heavily sclerotized, spinose areas on inner face, and sclerotized sacculus; anellus with posterior extension either tapering or enlarged

distally; aedeagus with vesica having slender sclerotized bands.

FEMALE GENITALIA: Very elongate; sterigma with large, elongate, rugose lateral plates, with or without posterior, median, sclerotized area; ductus bursae small, slender, twice as long as wide; ductus seminalis arising ventrally as small sac, with tube leading off therefrom; corpus bursae very slender, enlarged anteriorly, with longitudinal striations posteriorly; signum either small, with anterior margin tending to be flattened, or absent. Apophyses posteriores 3.3 to 4.2 mm. in length.

EARLY STAGES: Unknown.

FOOD PLANTS: Unknown.

TYPE SPECIES: *Mericisca gracea* Hulst; by original designation.

DISTRIBUTION: The four southern Rocky Mountain states in the United States, and extending into Mexico as far south as the Distrito Federal and Morelos.

Seven species are included in this subgenus. Three (*gracea*, *rufa*, and *munda*) have the maculation prominent, with complete cross lines and distinct pattern. The other four (*perpictaria*, *uniformis*, *scobina*, and *macguffini*) have an even, overall pattern, with barely discernible cross lines.

McDunnough (1938, p. 163) placed *fumida* Warren in *Mericisca*; I have transferred it to the genus *Ultralcis* McDunnough (Rindge, 1958, p. 14).

KEY TO SPECIES

BASED ON MACULATION AND DISTRIBUTION

1. Upper surface of wings with complete, solid outer cross line 2
   Upper surface of wings with outer cross line incomplete, represented by series of dots 4
2(1). Upper surface of wings with broad, reddish brown band distad of outer cross line . 3
   Upper surface of wings with narrow, brownish black band distad of outer cross line . . . . . *munda*
3(2). Upper surface of forewings with broad black median shade band, with both margins tending to be diffuse . . . . . *gracea*
   Upper surface of forewings with dark brown median shade band, with inner margin straight and sharply defined, the outer margin diffuse . . . . . *rufa*
4(1). Length of forewing 13 to 19 mm. . *perpictaria*
   Length of forewing 19 to 22 mm. 5
5(4). Upper surface of wings of males dark grayish brown, with very little maculation . . . . . *uniformis*
   Upper surface of wings of males pale grayish brown to pinkish brown, with discal spot and t. p. line usually represented . . . 6
6(5). Upper surface of forewings with small discal dot, and with t. p. line usually well represented at least in anterior part of wing; southwestern United States . . . . *scobina*
   Upper surface of forewings with large, pale centered discal dot, and with t. p. line represented by dots or dashes on veins; Durango . . . . . *macguffini*

BASED ON MALE GENITALIA[1]

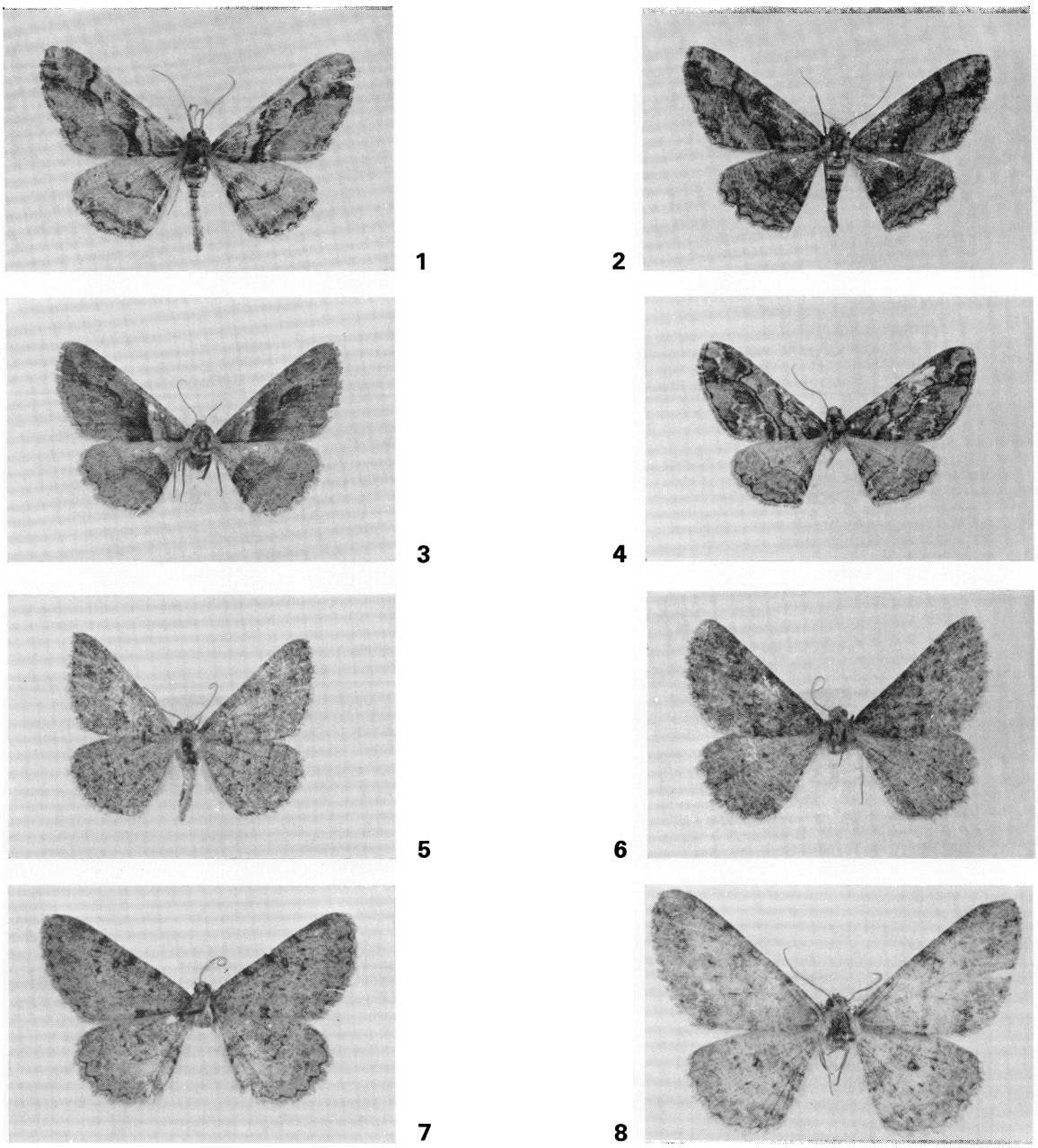
1. Uncus short, with lateral projections on each side medially, and with apex broad and bluntly rounded 2
   Uncus elongate, evenly tapering to fine point 3
2(1). Anellus with posterior extension appearing as tapering process, not sclerotized or differentiated from anterior portion . . *scobina*
   Anellus with posterior extension appearing as sclerotized rodlike structure, bifurcate anteriorly and slightly swollen apically . . . . . *macguffini*
3(1). Valve with spinose process of valvula approximately 0.2 mm. wide and 0.4 mm. long 4
   Valve with spinose process of valvula approximately 0.1 mm. wide and 0.3 mm. long . 5
4(3). Anellus with thick, heavily sclerotized, rodlike extension going length of slender posterior section . . . . . *gracea*
   Anellus thickened only between basal area and broadened posterior section . . *munda*
5(4). Uncus broader than long; width of base 0.5 mm. . . . . *uniformis*
   Uncus with width equal to length; width of base 0.4 mm. . . . . *perpictaria*

BASED ON FEMALE GENITALIA[2]

1. Signum present 2
   Signum absent . . . . . *perpictaria*
2(1). Sterigma broadly sclerotized posteriad of ostium . . . . . *scobina*
   Sterigma without sclerotization posteriad of ostium 3
3(2). Corpus bursae 5.4 to 5.7 mm. in length . . . . . *gracea*
   Corpus bursae 4.3 mm. in length . . . *rufa*

[1]The males of *rufa* are unknown.

[2]The females of *munda*, *uniformis*, and *macguffini* are unknown.



FIGS. 1–8. Adults of *Mericisca* (*Mericisca*). 1, 2. *M.* (*M.*) *gracea* Hulst. 1. Male, Blue Spruce Camp, Utah, July 1, 1963 (F., P., and M. Rindge; AMNH). 2. Female, 3 miles south of Alpine, Arizona, June 18, 1966 (R. F. Sternitzky; AMNH). 3. *M.* (*M.*) *rufa*, new species, holotype female, 1 mile south of Cedritos, Coahuila, June 22, 1957 (R. Zweifel; AMNH). 4. *M.* (*M.*) *munda*, new species, holotype male, Matachic, Chihuahua, July 7, 1947 (W. Gertsch and M. Cazier; AMNH). 5. *M.* (*M.*) *perpictaria* (Barnes and McDunnough), male, Southwestern Research Station of the American Museum of Natural History, Arizona, July 27, 1959 (M. Statham; AMNH). 6. *M.* (*M.*) *uniformis*, new species, holotype male, San Angel, Mexico, June 25, 1911 (C. C. Hoffmann; AMNH). 7. *M.* (*M.*) *scobina* Rindge, holotype male, Southwestern Research Station of the American Museum of Natural History, Arizona, July 26, 1957 (M. Statham; AMNH). 8. *M.* (*M.*) *macguffini*, new species, holotype male, 10 miles west of El Salto, Durango, July 7, 1964 (W. C. McGuffin; CNC). All figures $\times 1.3$.

Mericisca (*Mericisca*) *gracea* Hulst

Figures 1, 2, 9, 15, 16, 20

Mericisca gracea HULST, 1896, p. 356. DYAR, "1902" [1903], p. 325. SMITH, 1903, p. 77. BARNES AND MCDUNNOUGH, 1917, p. 118. MCDUNNOUGH, 1920, p. 17, pl. 2, fig. 4 (male genitalia), pl. 8, fig. 11 (adult male), pl. 9, fig. 1 (male antennae), pl. 11, fig. 4 (venation); 1938, p. 163. RINDGE, 1955, p. 144.

DIAGNOSIS: This species can be recognized by the complete, prominent cross lines on the upper surface of the wings, the broad, black median band, and the wide, reddish brown area distad of the outer cross lines.

MALE: Head, vertex pale to dark gray; front having low dorsolateral rims, dark gray or grayish black dorsally, becoming paler ventrally; palpi with first segment long scaled below, pale brownish gray, terminal two segments with appressed grayish brown and dark gray scales; antennae with about 58 segments, terminal 10 simple, longest pectinations about twice as long as basal segment, 0.4 mm. in length. Thorax above with mixture of pale gray, grayish brown and brown scales and hairlike scales, collar with broad, diffuse black band, and posterior tufts prominent; below pale brownish gray or grayish white; legs pale brownish gray, with variable amount of grayish black scaling. Abdomen above gray or grayish brown, with diffuse grayish black band posteriorly on each segment; below pale brownish gray or grayish white.

VENATION: Forewings with or without areole; veins R_1 and R_2 usually arising separately.

UPPER SURFACE OF WINGS: Forewings pale gray, basal and outer areas mostly reddish brown, with variable number of grayish black and brownish black scales; cross lines complete, black, prominent; t. a. line arising on costa about one-fifth of distance from base, outwardly angled to cell, then sharply curving basally to anal vein, being weakly concave in middle of wing, with inward angle to inner margin; median shade line broad, at least 1 mm. in width, straight or weakly curved, and having diffuse edges; discal dash small, elongate; t. p. line arising on costa three-fourths of distance from base, slightly inwardly oblique to cell M_1, with slight median basal bend, then curving basally, becoming gently S-shaped, roughly paralleling outer margin, meeting inner margin near middle; subterminal area broadly suffused with reddish brown, with some dark scaling opposite end of cell; s. t. line absent or obsolescent, its position in some individuals marked by more grayish terminal area; terminal line black, enlarged in cells; fringe concolorous with wing. Hind wings concolorous with forewings, pale gray as far as extradiscal line, with median shade band of variable thickness and small or obsolescent discal dash; extradiscal line complete, thin anteriorly, curving opposite cell and again before anal margin; outer portion of wing similar to that of forewing.

UNDER SURFACE OF WINGS: All wings even, pale brownish gray, with maculation of upper surface weakly indicated.

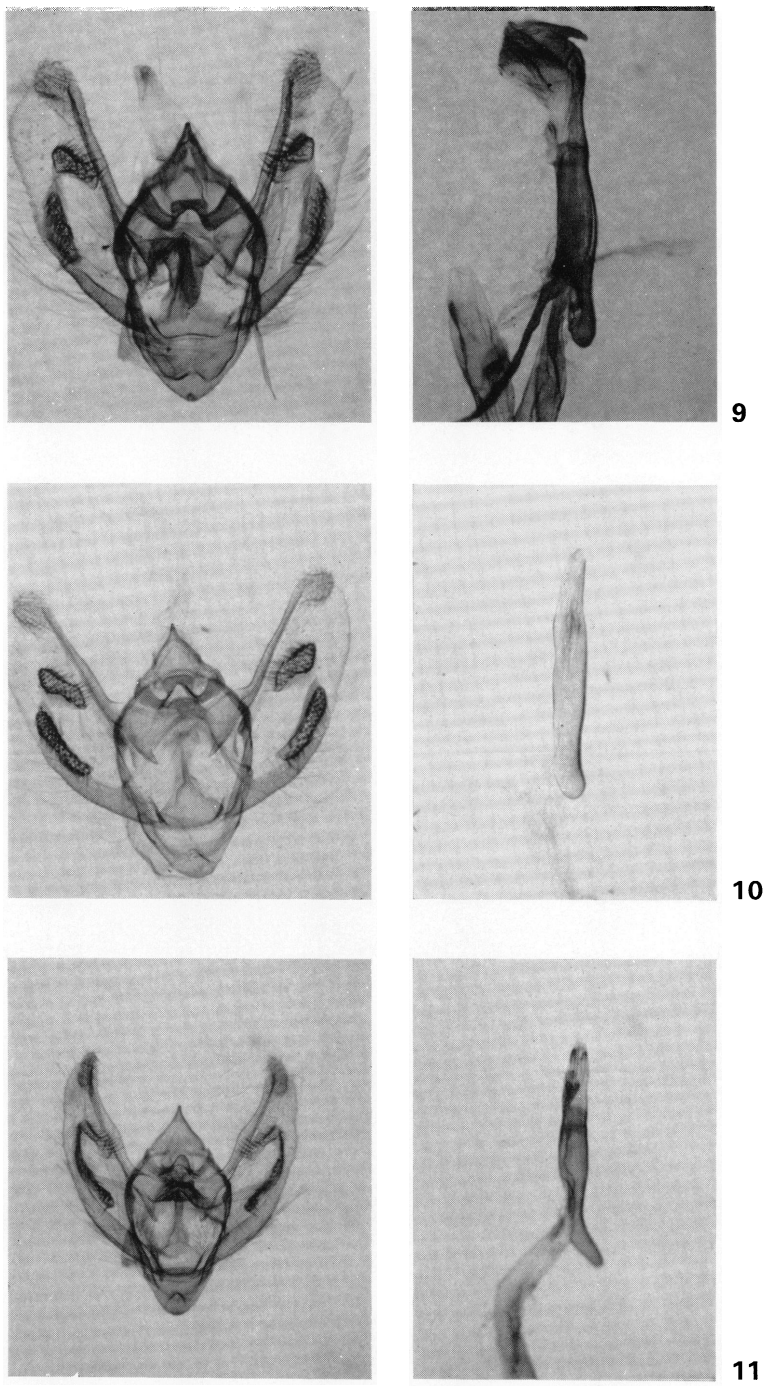
LENGTH OF FOREWING: 16 to 22 mm.

FEMALE: Similar to male; antennae with about 54 segments; upper surface of wings more heavily covered with brownish black scales, with subterminal areas tending to be slightly brighter than in male; under surface of wings tending to be slightly grayer than in males.

LENGTH OF FOREWING: 16 to 20 mm.

MALE GENITALIA: Uncus broadly triangular, sides weakly concave or with slight median swelling, with apex pointed and curved ventrally; gnathos wide laterally, with punctate, moderately large, apically truncate median enlargement; valves with apical setose area rounded, tending to taper anteriorly toward costa, 0.25 mm. in width, with median, diagonal, sclerotized and spinose valvular area varying in shape, roughly rectangular, 0.34 to 0.42 mm. long and 0.15 to 0.22 mm. wide, with saccular spinose area narrowly attached to valvular process, 0.60 to 0.70 mm. in length, weakly curved, sacculus a heavily sclerotized, rounded or flattened area; anellus broad anteriorly, with posterior extension elongate, slender, thickened medially for entire length; aedeagus longer than combined lengths of uncus, tegumen, and saccus, with posterior end slightly tapered and rounded; vesica armed with weakly sclerotized, finely scobinate, longitudinal bands.

FEMALE GENITALIA: Sterigma with broad, elongate, anteriorly tapering, rugose, heavily sclerotized lateral areas, about 1.0 mm. in length, with more slender, similar sclerotized bands in intersegmental area, paralleling sterigmal plates, with area posteriad of ostium with small, sclerotized, transverse area at about half of length of sterigmal plates; ductus bursae sclerotized, about 0.35 mm. in length and 0.15 mm. in width; ductus seminalis arising



FIGS. 9–11. Male genitalia of *Mericisca* (*Mericisca*). 9. *M.* (*M.*) *gracea* Hulst, 10 miles west of El Salto, Durango, July 1, 1964 (J. E. H. Martin; AMNH). 10. *M.* (*M.*) *munda*, new species, paratype, Matachic, Chihuahua, July 7, 1947 (W. Gertsch and M. Cazier; AMNH). 11. *M.* (*M.*) *perpictaria* (Barnes and McDunnough), Ramsey Canyon, Arizona, July 18, 1968 (R. F. Sternitzky; AMNH).

ventrally near ductus bursae; corpus bursae very long, 5.4 to 5.7 mm., extending almost entire length of abdomen, posterior portion slender, with a few short longitudinal striations at posterior end, with small anterior end rather abruptly swollen, one side rounded the other bluntly pointed; signum small, anterior side concave, outer margin with variable number of short projection. Apophyses posteriores 3.3 to 3.6 mm. in length.

TYPES: Hulst did not specify the number or the sexes of the specimens in his type series; at least two specimens were present, as indicated by the two wing measurements in his original description. There was a male in the Barnes collection labeled as the type; this specimen was figured by McDunnough (1920, pl. 8, fig. 11). This specimen was not located in the National Museum of Natural History collection, although two "Colo. (Bruce)" specimens are there. There is a female type in the collection of the American Museum of Natural History; this specimen is hereby designated as the lectotype. Its genitalia are mounted on slide FHR 16270. There are also pseudotypes in the collections of the American Museum and of the National Museum of Natural History, bearing Hulst's type labels (Rindge, 1955, p. 144); both are labeled as being from Glenwood Springs, Colorado.

TYPE LOCALITY: Colorado (Bruce).

DISTRIBUTION: In the United States, the mountainous regions of Colorado, southern Utah, Arizona, and New Mexico (fig. 20). The moths have been taken at altitudes from at least 5000 to 9000 feet. The species is also known from the State of Durango in Mexico, at an elevation of 9000 feet.

TIME OF FLIGHT: *M. gracea* is partially double brooded. A few specimens have been caught in February, March, and April (in both Arizona and Colorado); most of the moths were captured in June, July, and August. There is also one September record.

REMARKS: Five hundred forty-four specimens (440 males, 104 females) and 16 genitalic dissections (nine males, seven females) have been studied, including the lectotype and its genitalia.

This species is most commonly taken in New Mexico and Arizona. In the latter state, the moths from the Huachuca and Chiricahua Mountains of Cochise County are slightly smaller in size, duller, and less contrasting in color than are the adults from the White Mountains and Coconino County. The specimens from Durango are slightly larger than those from eastern and northern Arizona, and tend to be slightly more heavily suffused with dark brown above.

Mericisca* (*Mericisca*) *rufa, new species

Figures 3, 17

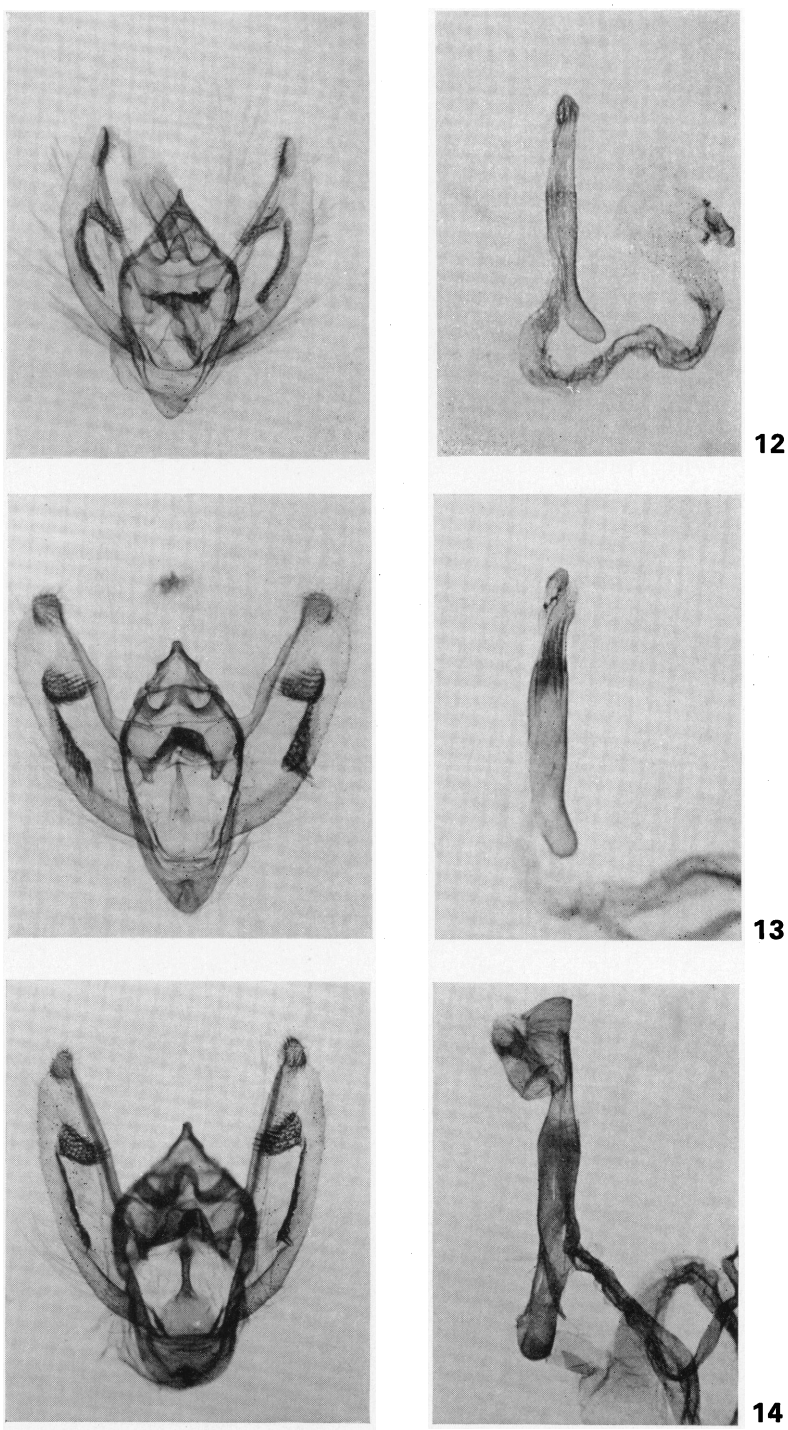
DIAGNOSIS: This species has the upper surface of the wings paler than in *gracea*, particularly the hind wings; the dark brown median band is sharply defined and straight on the basal side, then fades off into the t. p. line distally. The female antennae are serrate. Good genitalic differences are present in the female to distinguish *rufa* from *gracea*; see the key for details.

MALE: Unknown.

FEMALE: Head, vertex pale gray; front pale gray dorsally, dark brown medially, and narrowly grayish brown ventrally; palpi pale brown, with first and second segments long scaled below; antennae serrate. Thorax above pale gray, collar with scattered grayish black scales and outer portion dark gray, with posterior tufts weakly represented, pale gray with some black scaling posteriorly; below grayish brown; legs grayish brown, with variable amount of dark brown scales. Abdomen above pale gray with scattered grayish brown scales; below pale brownish gray.

VENATION: Forewings without areole; veins R_1 and R_2 arising separately.

UPPER SURFACE OF WINGS: Forewings mainly reddish brown, with whitish gray band between t. a. and median lines, with scattered dark brown and grayish brown scales; cross lines complete, thin, mostly not prominent; t. a. line grayish brown, arising on costa one-fifth to one-fourth distance from base, course as in *gracea*; median shade band dark brown, inner margin straight and well-defined, prominent against narrow whitish gray median area, fading out distally and tending to obliterate lower portion of t. p. line; discal dot obsolescent; t. p. line arising on costa about seven-tenths of distance from base, course as in *gracea* but with stronger outward bulge opposite cell and somewhat straighter in lower portion of wing; subterminal area reddish brown, tending to become paler outwardly; s. t. line obsolescent, indicated by change in color to mainly dark grayish terminal area; terminal line weakly represented;



FIGS. 12–14. Male genitalia of *Mericisca* (*Mericisca*). 12. *M.* (*M.*) *uniformis*, new species, paratype, Quernevaca, Morelos, August 3, 1954 (J. G. Chillcott; CNC). 13. *M.* (*M.*) *scobina* Rindge, holotype, Southwestern Research Station of the American Museum of Natural History, Arizona, July 26, 1957 (M. Statham; AMNH). 14. *M.* (*M.*) *macguffini*, new species, holotype, 10 miles west of El Salto, Durango, July 7, 1964 (W. C. McGuffin; CNC).

fringe concolorous with wing. Hind wings grayer than forewings, with scattered brownish black scales; basal area whitish gray; median shade band absent anteriorly, grayish brown, shading out to extradiscal line; latter obsolescent anteriorly, with outward bend in cell M_1, then concave to anal margin; subterminal area with narrow grayish brown band distad of extradiscal line, then gray to wing margin; s. t. line weakly represented; terminal line and fringe similar to those of forewings.

UNDER SURFACE OF WINGS: All wings even pale gray, forewings with some grayish brown scales; without maculation except for faint trace of median shade band and t. p. line in upper part of forewings.

LENGTH OF FOREWING: 18 mm. (holotype).

MALE GENITALIA: Unknown.

FEMALE GENITALIA: Similar to those of *gracea* but differing mainly as follows: sterigma with lateral areas slightly shorter, 0.75 mm. in length, wider posteriorly, with fewer and more prominent rugae, sclerotized bands in intersegmental area also shorter, wider, and more rugose, area posteriad of ostium having slightly wider transverse sclerotized area situated more posteriorly; ductus bursae smaller, 0.30 mm. in length and 0.12 mm. in width; corpus bursae shorter, 4.3 mm. in length. Apophyses posteriores 3.4 mm. in length.

TYPE: Holotype, female, 1 mile south of Cedritos, Coahuila, Mexico, June 22, 1957 (R. Zweifel). The genitalia of the type are mounted on slide FHR 16264.

The type is in the collection of the American Museum of Natural History.

RANGE: This species is known only from the type locality in eastern Coahuila, in the lower portion of the Sierra Madre Oriental. The locality is about 16 miles east of Arteaga in a piñon pine and yucca association.

TIME OF FLIGHT: June.

REMARKS: One specimen and one genitalic dissection have been studied.

ETYMOLOGY: The specific name is from the Latin *rufus*, reddish or auburn, in reference to the color of the upper surface of the forewings.

Mericisca (Mericisca) munda, new species

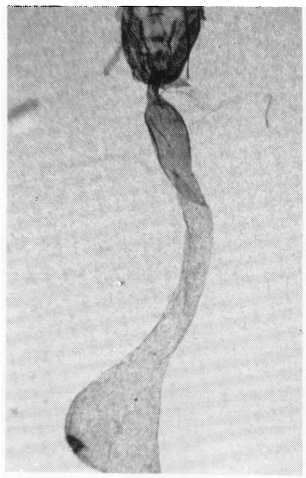
Figures 4, 10

DIAGNOSIS: This species can be distinguished from the two preceding ones by the more sharply defined cross lines and pattern on the upper surface of the wings. The forewings are darker brown than those of either *gracea* or *rufa*.

MALE: Head, vertex pale grayish white, with some brownish black scales between bases of antennae; front having low dorsolateral rims, grayish white dorsally, dark grayish brown medially, pale gray ventrally; palpi with first segment long scaled below, with mixed pale gray and grayish brown scales, terminal two segments with appressed grayish brown and brownish black scales; antennae with about 58 segments, with terminal 12 simple, longest pectinations one and one-half times as long as basal segment, 0.3 mm. in length. Thorax above with mixture of white or pale grayish white and dark brown scales and hairlike scales, collar with black band, with posterior tufts prominent, white; below whitish gray; legs pale brownish gray, with variable amount of dark brown scaling, tarsi with ends of segments whitish gray. Abdomen above pale gray, with some brown scaling, with narrow brownish black bands on posterior margins of all segments; below pale grayish white, with scattered brown scales.

VENATION: Forewings with or without areole; veins R_1 and R_2 either short stalked (holotype) or free (paratype).

UPPER SURFACE OF WINGS: Forewings pale gray, heavily suffused with dark brown and dark grayish brown; cross lines complete, black, distinct; t. a. line arising on costa one-fourth of distance from base, sharply angled outward into cell, making acute angle basally in cell and proceeding to inner margin one-fourth of distance from base, with t. a. line shaded basally by narrow brownish black shade band; median shade line black, narrow, 0.2 mm. in width, having outward bend in cubital cell; discal dash weakly represented; t. p. line arising on costa three-fourths of distance from base, course similar to that of *rufa* but with stronger outward angle anteriorly; subterminal area with narrow brownish black shade band distad of t. p. line, with outer portion of area grayish brown; s. t. line grayish white, complete, outwardly angled in cells; terminal area with dark scaling opposite cell and above anal angle; terminal line black, complete, slightly thickened in cells; fringe pale gray, with central portion brownish black. Hind wings concolorous with forewings but having less dark brown scaling; median shade band rather weakly represented, absent anteriorly;



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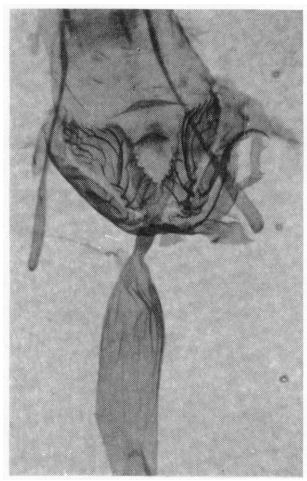

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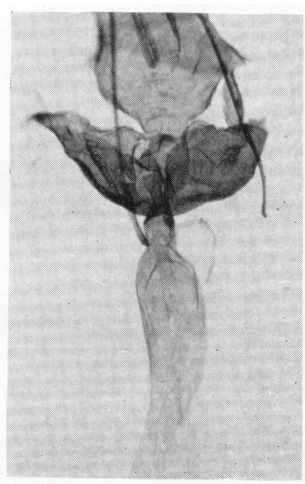

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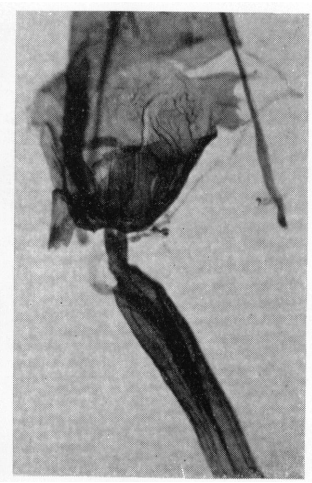

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discal spot small; extradiscal line complete, with strong outward bow in cell M_2, and outwardly curved to anal margin; subterminal area slightly darker than basal portion of wing, without noticeable shade band distad of extradiscal line; s. t. line grayish white, tending to fade out anteriorly; terminal line and fringe similar to those of forewings.

UNDER SURFACE OF WINGS: All wings even pale gray, with maculation of upper surface weakly indicated; forewings with apex white, diffusely outlined with brown and grayish brown scales.

LENGTH OF FOREWING: 17 (holotype) to 19 mm.

FEMALE: Unknown.

MALE GENITALIA: Similar to those of *gracea* differing mainly as follows: uncus with apex more attenuate, thinner; valves with median, diagonal, sclerotized valvular area tending to have ends bluntly pointed, 0.38 to 0.44 mm. long and 0.17 mm. at maximum width of spinose area, with saccular spinose area more broadly attached to valvular process and tending to have more spines; anellus triangular, with posterior extension swollen apically, with only constricted central area thickened.

FEMALE GENITALIA: Unknown.

TYPES: Holotype and paratype, both males, Matachic, Chihuahua, Mexico, July 7, 1947 (W. J. Gertsch and M. A. Cazier). The genitalia of the holotype are mounted on slide FHR 8235.

Both type specimens are in the collection of the American Museum of Natural History.

DISTRIBUTION: This species is known only from the type locality in western Chihuahua, in the Sierra Madre Occidental. The area is one with oaks, pines, and junipers (Spieth, 1950, p. 21).

TIME OF FLIGHT: July.

REMARKS: Two specimens (both males) and two genitalic dissections have been studied.

ETYMOLOGY: The specific name is from the Latin *mundus*, clear or neat, in reference to the maculation of the wings.

Mericisca (Mericisca) perpictaria (Barnes and McDunnough)

Figures 5, 11, 18, 21

Cleora perpictaria BARNES AND MCDUNNOUGH, 1916, p. 29, pl. 2, fig. 14 (lectotype male); 1917, p. 118, *Mericisca perpictaria*: MCDUNNOUGH, 1920, p. 17, pl. 2. fig. 11 (male genitalia); 1938, p. 163.

DIAGNOSIS: This is the first species to have the second type of maculation, with barely discernible cross lines and an even, overall pattern. *Mericisca perpictaria* is a small olivaceous gray (fading to brown or brownish gray) species.

MALE: Head, vertex gray; front flat, level with eyes, narrowly gray dorsally, dark grayish brown medially, with some gray scaling ventrolaterally; palpi dark gray, with scattered brownish black scales, first segment having some long scales ventrally; antennae with about 54 or 55 segments, with terminal 10 simple, longest pectinations twice as long as basal segment, 0.32 mm. in length. Thorax above pale to dark gray, collar without band, with moderate posterior tufts; below pale gray or whitish gray; legs pale gray, with variable number of grayish brown and brown scales, especially on forelegs and tarsi, latter with faint, pale edges at ends of segments. Abdomen above with mixed gray and brownish gray scales; below pale gray.

VENATION: Forewings with or without areole; origin of veins R_1 and R_2 variable, ranging from being widely separated to arising from common point.

UPPER SURFACE OF WINGS: All wings gray, heavily and evenly covered with dark gray, grayish brown, and black scales, producing a faintly olivaceous gray tone (fading to brown or brownish gray in old specimens); cross lines grayish black, faintly represented, in some specimens by venular dots only; t. a. line arising on costa about one-fourth of distance from base, apparently more or less evenly curved across wing; median shade band represented by costal spot only; discal dot small and round, or

FIGS. 15–19. Female genitalia of *Mericisca (Mericisca)*, showing sterigma, ductus bursae, and adjacent areas. 15, 16. *M. (M.) gracea* Hulst, Rist Canyon, Colorado, July 10, 1957 (F. and P. Rindge; AMNH). 17. *M. (M.) rufa*, new species, holotype, 1 mile south of Cedritos, Coahuila, June 22, 1957 (R. Zweifel; AMNH). 18. *M. (M.) perpictaria* (Barnes and McDunnough), Pinery Canyon, Arizona, August 9, 1964 (R. H. Leuschner; RHL). 19. *M. (M.) scobina* Rindge, Southwestern Research Station of the American Museum of Natural History, Arizona, July 23, 1958 (M. Cazier; AMNH).

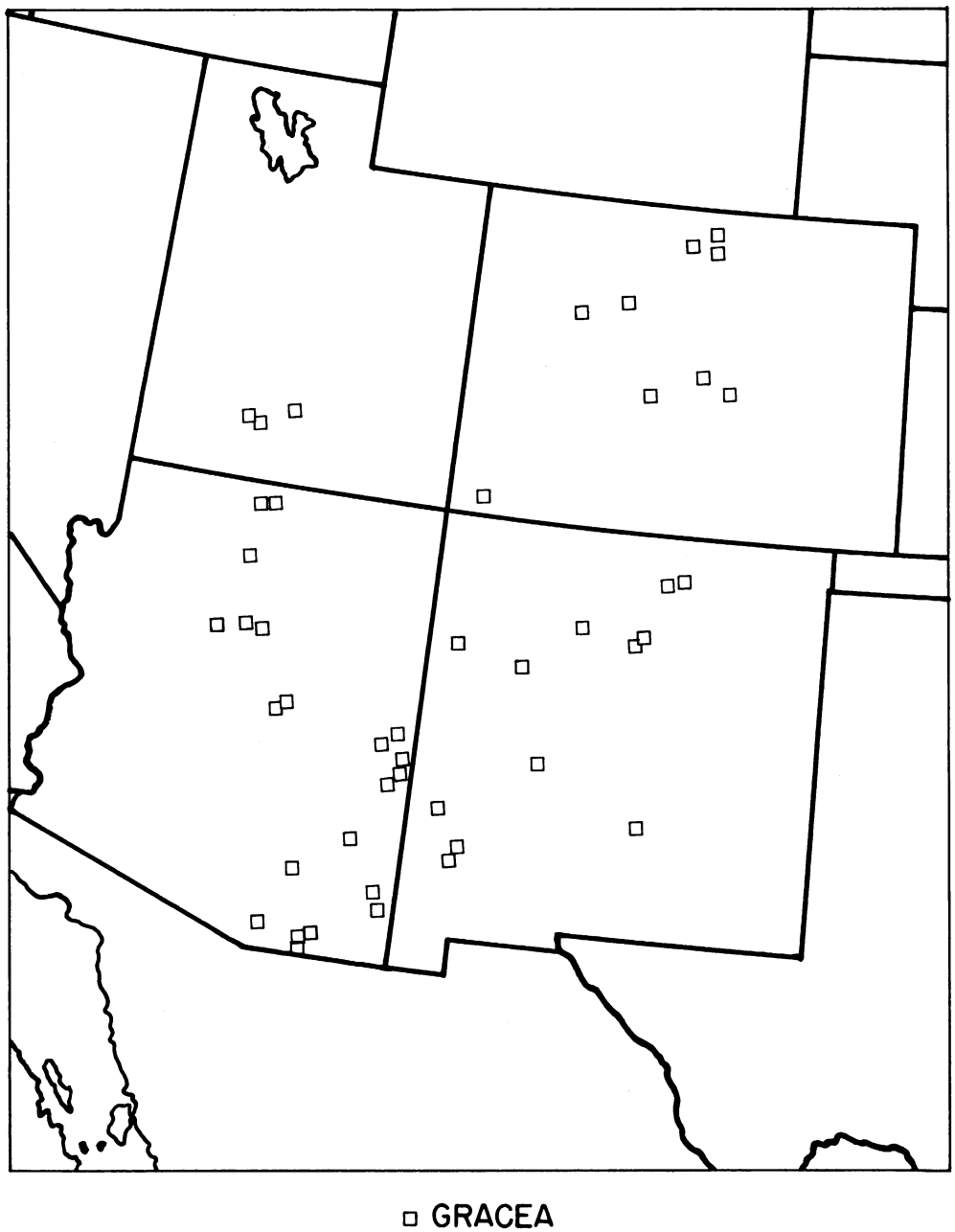


Fig. 20. The distribution of *Mericisca* (*Mericisca*) *gracea* Hulst in the United States.

obsolescent; t. p. line arising on costa about two-thirds of distance from base, paralleling outer margin to vein Cu_1 or Cu_2, then sharply concave to anal vein; subterminal area with suggestion of faint, narrow, gray shade line beyond t. p. line in some specimens, and with blackish spot opposite cell; s. t. line either weakly represented or absent; terminal line black, narrow, interrupted by veins, enlarged in cells; fringe concolorous with wing. Hind wings similar to forewings, with small discal dot, with complete to obsolescent extradiscal line, rather irregular in course, with outer portion of wing similar to forewing.

UNDER SURFACE OF WINGS: All wings even, pale brownish gray; forewing with variable amount of dark gray scaling; without maculation except for discal dots and faint trace of t. p. line anteriorly on forewings of some specimens.

LENGTH OF FOREWING: 13 to 17 mm.

FEMALE: Similar to male; upper surface of wings appearing slightly darker than male, with almost no pattern; under surface also tending to have more dark scaling.

LENGTH OF FOREWING: 17 to 19 mm.

MALE GENITALIA: Similar to those of *gracea* but differing mainly as follows: uncus with or without slight lateral swelling above base, with elongate apical region; gnathos more slender, and smaller, narrower, more apically rounded median enlargement; valves with slight median costal swelling, with median, diagonal sclerotized, and spinose valvular area much thinner, 0.34 to 0.46 mm. in length, about 0.06 mm. wide, with saccular spinose area attached distally to valvular process, 0.62 to 0.70 mm. in length; anellus in form of elongate triangle, with slender posterior extension shorter than length of basal portion of anellus.

FEMALE GENITALIA: Sterigma with wide, triangular, outwardly rugose, sclerotized lateral areas, about 0.25 mm. in length, with area posteriad of ostium having caudally rounded, median sclerotized area and more lightly sclerotized posterior pair of subrectangular areas, and ventral surface of ostium covered with elongate, elliptical pair of plates; ductus bursae widest anteriorly, 0.2 mm. in width, posteriorly sclerotized and anteriorly membranous, the two areas of about equal length; corpus bursae elongate, 4.1 to 4.6 mm. in length, with anterior end barely enlarged; signum absent. Apophyses posteriores 3.25 to 3.35 mm. in length.

TYPES: This species was described from five male specimens. The lectotype is hereby designated as the specimen labelled "Type ♂"; it was illustrated by the authors (Barnes and McDunnough, 1916, pl. 2, fig. 14). This specimen is in the collection of the National Museum of Natural History and its genitalia are mounted on slide GFGC 2103.

TYPE LOCALITY: Paradise, Cochise County, Arizona.

DISTRIBUTION: The mountains of southern Arizona (fig. 21). The species is known primarily from the Santa Rita, Huachuca, and Chiricahua Mountains; a single male has been examined from the White Mountains.

TIME OF FLIGHT: June, July, August, and September. The species is partially double brooded, as one early April record is known.

REMARKS: Forty-two specimens (37 males, five females) and seven genitalic dissections (five males, two females) have been studied, including the lectotype and its genitalia.

There is some variability in the course of the cross lines on the upper surface of the wings and in the strength of these lines.

Mericisca (Mericisca) uniformis, new species

Figures 6, 12

DIAGNOSIS: This species is larger and has the upper surface of the wings browner than does *perpictaria*. Genitalic differences are also present; see the key.

MALE: Head, vertex grayish brown, with some grayish black scaling between bases of antennae; front as in *perpictaria*; palpi similar to those of *perpictaria* but grayish black; antennae with about 52 segments, terminal nine simple, longest pectinations one and three-quarter times as long as basal segment, 0.34 mm. in length. Thorax, legs, and abdomen similar to those of *perpictaria*, but with thorax and abdomen grayish brown above and legs with more dark brown scaling.

VENATION: Forewings with or without weakly indicated areole; veins R_1 and R_2 arising well separated.

UPPER SURFACE OF WINGS: All wings with even mixture of gray, dark gray, grayish brown, and brownish black scales, producing a finely dotted, dark grayish brown tone; cross lines very weakly represented, apparently similar in course to those of *perpictaria*; discal spot and outer portion of wing similar to those of *perpictaria*. Hind wings similar to those of forewings, with maculation similar to that of *perpictaria*.

UNDER SURFACE OF WINGS: Similar to that of *perpictaria*, but tending to be slightly paler gray.

LENGTH OF FOREWING: 19 to 20 mm.; holotype, 19 mm.

FEMALE: Unknown.

MALE GENITALIA: Similar to those of *perpictaria*, differing mainly as follows: uncus with broader base, 0.5 mm. wide (0.4 mm. in *perpictaria*), with shorter apical region; gnathos with larger median enlargement having more

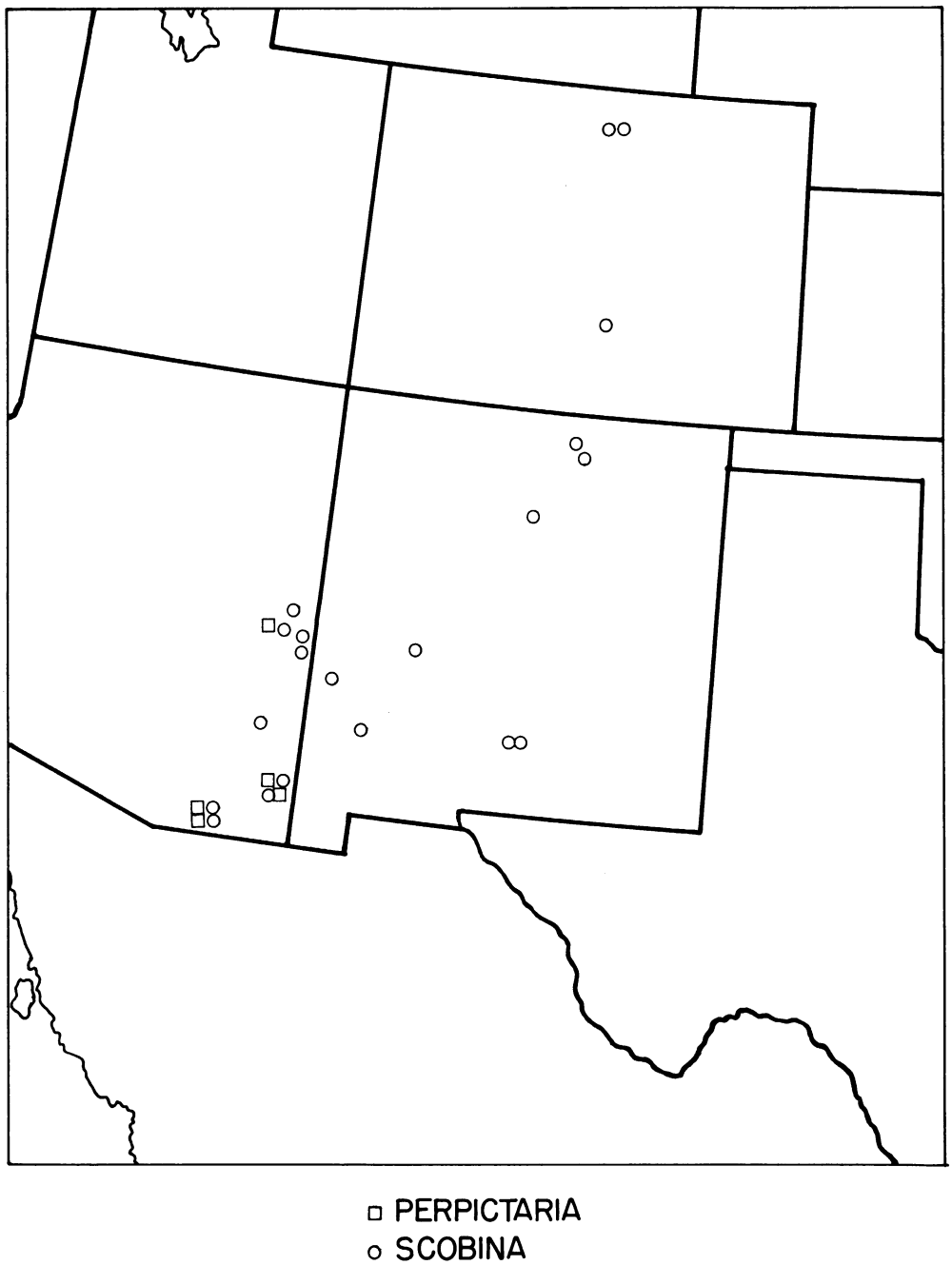


FIG. 21. The distribution of *Mericisca* (*Mericisca*) *perpictaria* (Barnes and McDunnough) and *M.* (*M.*) *scobina* Rindge.

broadly rounded apex; valve with weak costal swelling, spinose valvular area 0.36 to 0.40 mm. in length and 0.08 to 0.10 mm. in width, with saccular spinose area 0.70 mm. in length; anellus a shorter triangle anteriorly, with slender posterior extension slightly widened apically, in length equal to length of basal portion of anellus.

FEMALE GENITALIA: Unknown.

TYPES: Holotype, male, San Angel, Distrito Federal, Mexico, June 25, 1911 (C. C. Hoffmann). The genitalia of the holotype are mounted on slide FHR 10059. Paratypes: same data as holotype but June 28, 1911, one male; Quernevaca, Morelos, Mexico, August 3, 1954, elevation 3250 feet (J. G. Chillcott), one male.

The holotype is in the collection of the American Museum of Natural History; paratypes are in the collections of that institution and of the Canadian National Collection.

DISTRIBUTION: This species is known only from the Distrito Federal and the State of Morelos.

TIME OF FLIGHT: June and August.

REMARKS: Seven specimens (all males) and two genitalic dissections have been studied. Four males have been examined in the collection of Dr. Escalante but were not compared with the type series; accordingly, they have not been designated as paratypes.

ETYMOLOGY: The specific name is from the Latin *uniformis*, uniform, in reference to the color of the upper surface of the wings.

Mericisca (*Mericisca*) *scobina* Rindge

Figures 7, 13, 19, 21

Mericisca scobina RINDGE, 1958, p. 8, figs. 8 (paratype male), 16, 17 (male genitalia), 22 (female genitalia).

DIAGNOSIS: The males of *scobina* are similar in size and pattern to those of *uniformis* but have the upper surface of the wings paler; the females are practically concolorous with the males of the Mexican species. Good genitalic differences are present between these two species; see the key for details.

MALE: Head, vertex and front dark to pale gray, latter level with eyes, flat; palpi similar to those of *uniformis* but with more pale brownish gray scaling on first segment; antennae with 58 segments, terminal 10 simple, longest pectinations one and one-half times as long as basal segment, 0.30 mm. in length. Thorax, legs, and abdomen similar to those of *perpictaria*.

VENATION: Forewings with or without areole; veins R_1 and R_2 arising well separated.

UPPER SURFACE OF WINGS: All wings with even mixture of pale gray, faintly pinkish brown, grayish brown, and brownish black scales, producing a finely dotted, faintly pinkish brown to grayish brown color; pattern similar to that of *uniformis*, but discal spot tending to be larger, rounded, with pale scaling medially. Hind wings similar to those of forewings, with maculation similar to that of *uniformis*, with exception of larger discal dots.

UNDER SURFACE OF WINGS: Similar to that of *uniformis*, but with tendency for slightly more pattern and larger discal spots to be present.

LENGTH OF FOREWING: 19 to 22 mm.

FEMALE: Similar to male, but with upper surface more heavily suffused with dark brown and blackish brown scales; under surface darker gray.

LENGTH OF FOREWING: 17 to 21 mm.

MALE GENITALIA: Similar to those of *uniformis*, differing mainly as follows: uncus wider than long, with projecting points medially on each side, and with broad, apically rounded apex; gnathos with median enlargement shorter, with more tapering sides; valves with shorter, wider valvular spinose area, varying in shape from rounded to triangular, 0.30 to 0.42 mm. in length and 0.18 to 0.42 mm. in width, with saccular spinose area 0.58 to 0.68 mm. in length; anellus with anterior portion slightly larger, varying from quadrate to an elongate triangle, with posterior extension tending to be wider medially and narrowed posteriorly; vesica with thicker sclerotized bands.

FEMALE GENITALIA: Similar to those of *gracea* but differing mainly as follows: sterigma with more heavily sclerotized, transverse area posteriad of median sclerotized band; ductus bursae slightly larger; corpus bursae 4.1 to 4.5 mm. in length, with posterior portion tending to be somewhat more heavily and deeply striate. Apophyses posteriores, 3.65 to 4.10 mm. in length.

TYPES: The holotype, male, is in the collection of the American Museum of Natural History; its genitalia are mounted on slide FHR 16203. The allotype is in the collection of the Los Angeles County Museum of Natural History.

TYPE LOCALITY: Southwestern Research Station of the American Museum of Natural History, 5 miles west of Portal, Cochise County, Arizona, elevation 5400 feet.

DISTRIBUTION: The mountains of southeastern and eastern Arizona, New Mexico, extending north up the Front Range into northern

Colorado (fig. 21). The known elevations range from about 5000 to 9000 feet.

TIME OF FLIGHT: June, July, and August. This species is also partially double brooded, as there is one April record from Arizona.

REMARKS: One hundred thirty-three specimens (115 males, 18 females) and 14 genitalic dissections (10 males, four females) have been examined.

There is some variation in the color of the upper surface of the wings, depending on the amount of scaling of the various colors present. In the males there is a range of pale grayish brown, faintly pinkish brown to a darker, almost olivaceous brown. The females are rarely represented in collections; judging from the limited material available, they seem to be rather uniform in color.

Mericisca (Mericisca) macguffini, new species

Figures 8, 14

DIAGNOSIS: This species looks very much like *scobina,* but it is larger, has bigger, pale-centered discal spots on the upper surface of the forewings, and a broad, rather nebulous, dark intradiscal band on the lower portion of the hind wings. There are also differences in the genitalia.

MALE: Head similar to that of *scobina,* but lower portion of front pale gray, and antennae with fewer segments, about 51. Thorax with patagia more pinkish gray than that of *scobina.* Abdomen above with first segment pale gray and scattered dark brown scales, remainder of segments grayish brown, with scattered dark brownish gray scales, especially on second segment, forming broad, indistinct band; below pale gray.

VENATION: Forewings with areole; veins R_1 and R_2 arising together.

UPPER SURFACE OF WINGS: Color and maculation very similar to those of *scobina* but differing mainly as follows: color slightly paler and pinker, with patches of grayish brown scales along s. t. line of forewings; latter with larger, round discal spot, central area grayish white; t. p. line represented by spots or dashes on veins; hind wings with broad (2 mm. wide) nebulous, grayish brown intradiscal band in lower portion of wing; discal spot dark, pale centered, triangular; extradiscal line tending to be more weakly represented.

UNDER SURFACE OF WINGS: Similar to that of *scobina* but with larger discal dots.

LENGTH OF FOREWING: 22 mm. (holotype).

FEMALE: Unknown.

MALE GENITALIA: Similar to those of *scobina,* differing mainly as follows: uncus with apical portion slightly longer and narrower; gnathos broader laterally, with longer, more deeply formed U-shaped median enlargement; valves longer and narrower, tapering to apex, valvular spinose area tending to be more rectangular in outline, with saccular spinose area longer, 0.75 mm. in length; anellus with posterior margins more angulate, with posterior extension heavily sclerotized, bifurcate anteriorly, rodlike, slightly enlarged apically; saccus appearing broader and squarer in outline; aedeagus longer, 2.5 mm. (*scobina* with length of aedeagus 1.9 to 2.3 mm.).

FEMALE GENITALIA: Unknown.

TYPE: Holotype, male, 10 miles west of El Salto, Durango, Mexico, elevation 9000 feet, July 7, 1964 (W. C. McGuffin). The genitalia of the type are mounted on slide FHR 16344.

The holotype is in the collection of the Canadian National Collection, Ottawa.

DISTRIBUTION: This species is known only from the type locality in Durango.

TIME OF FLIGHT: July.

REMARKS: One male and one genitalic dissection have been studied.

ETYMOLOGY: It gives me great pleasure to name this species in honor of my friend, colleague, and captor of this unique specimen, Dr. W. Clayton McGuffin of the Entomological Research Institute, Ottawa. The orthography of the specific name has been altered in compliance with Appendix D, section III, paragraph 21(a) of the International Code of Zoological Nomenclature.

PUEBLA, NEW SUBGENUS

DIAGNOSIS: The antennae of the males have very short pectinations, about 0.1 mm. in length, the setae being long and conspicuous, and having from about 61 to 76 segments; the female antennae are simple. The male genitalia have either two spinose areas on the inner face of each valve, an apically curved uncus, and prominent socius, or a raised, setose, valvular process, a broad bell-like uncus, and no socius. The female genitalia (of the type species) have

the sterigma with both smoothly sclerotized lateral plates and a slender, elongate median strip; the corpus bursae is very long and corkscrew shaped.

ADULTS: Head with front level with eyes, flat, smoothly sclerotized; antennae of male with about 61 to 76 segments, terminal 10 to 22 simple, with longest pectinations about three-fourths to one and one-half as long as their basal segments, about 0.1 mm. in length, with very long and conspicuous setae; antennae of female simple. Thorax with foreleg without spinose projection; hind leg of male with both hair pencil and groove. Abdomen with row of setae in male on ventral surface of third segment. Forewings with 12 veins, with or without areole.

MACULATION: Gray and brown species with prominent, complete cross lines on upper surface, having distinct pattern; under surface with pattern more faintly reproduced, with dark area near apex of forewing.

MALE GENITALIA: Uncus with broad base, lateral margins more or less constricted medially, and either with ventrally curving, truncate to weakly bifurcate apex, or broad, bell-like, and small spinose tip; socius either in form of pair of sparsely setose, elongate, slender, digitate projections from uncus, or absent; gnathos large, heavily sclerotized; valves with apical spinose area, with either one heavily sclerotized area in middle of valvular face, strongly narrowed medially, having thick spines on both ends, and sclerotized sacculus, or raised, setose, valvular process; anellus widened posteriorly; aedeagus relatively short and broad; vesica with one side more or less sclerotized and striate, the other bulging out, having large spinulose area.

FEMALE GENITALIA (based on type species only): Very elongate; sterigma with large, semicircular, smoothly sclerotized lateral plates, and very long, slender, sclerotized median strip enlarging in width posteriorly; ductus bursae small, slender, increasing in width anteriorly; ductus seminalis from tubular enlargement arising dorsally at end of corpus bursae to right of ductus bursae; corpus bursae corkscrew shaped, posterior end somewhat enlarged, with punctate surface, anterior end swollen, dorsal surface with numerous concentric rings around large, evenly stellate signum; latter slightly wider than long, having several, small, raised spines or ridges in large median area. Apophyses posteriores extremely long, 9.6 mm. in length.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPE SPECIES: *Boarmia aztecaria* Schaus.

DISTRIBUTION: Central Mexico.

REMARKS: The type of maculation found on the moths of *Puebla* is basically similar to that of *M.* (*Mericisca*) *gracea*. The members of the present subgenus can be easily recognized by the different male antennae, and the distinctive genitalia. Based on the genitalic characters of *aztecaria* alone, *Puebla* could easily be considered a distinct genus, as these structures in both sexes are the most distinctive to be found in the genus *Mericisca*. However, when all characters are considered and evaluated, it is thought best to keep this group as a subgenus.

Whether or not *parva* should be retained in this subgenus is a problem, the answer to which probably will not be known until the female of this species becomes available for study. Both *aztecaria* and *parva* have similar types of color, pattern, and male antennae. The genitalia of the two are quite divergent, except for the vesica, and this would tend to throw doubts on keeping them in the same group. However, rather than create two monotypic subgenera, the two species are placed in *Puebla* until further information comes to hand.

ETYMOLOGY: This name is that of one of the states of Mexico. Its gender is feminine.

KEY TO SPECIES[1]

BASED ON SIZE AND MACULATION

Forewing 20 to 24 mm. in length; upper surface of forewing with definite, black median line . *aztecaria*

Forewing 14 to 15 mm. in length; upper surface of forewing without prominent median line. . *parva*

BASED ON MALE GENITALIA

Uncus with lateral margins constructed medially, apex curved ventrally; socius present, prominent . . . . . *aztecaria*

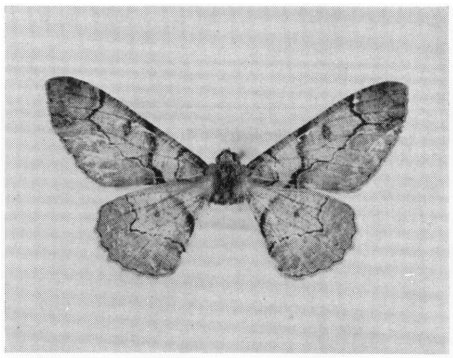
Uncus bell-like in outline, apex with short posteriorly pointed spine; socius absent . . . . . *parva*

Mericisca (*Puebla*) *aztecaria* (Schaus), new combination

Figures 22, 24, 73

Boarmia aztecaria SCHAUS, 1897, p. 165. DRUCE, 1898 (1891–1900), p. 534.

[1]The female of *parva* is unknown.



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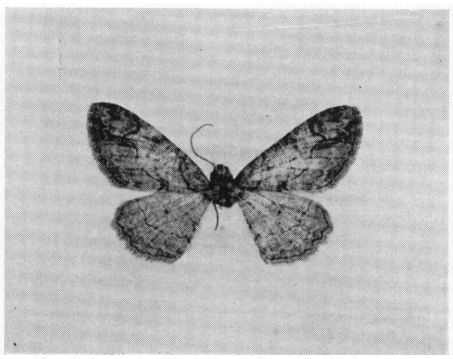

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FIGS. 22, 23. Adults of *Mericisca* (*Puebla*). 22. *M.* (*P.*) *aztecaria* (Schaus), male, near Llera, Tamaulipas, June 12, 1970 (W. H. Howe; AMNH). 23. *M.* (*P.*) *parva*, new species, holotype male, 16 kilometers southwest of Zapotitlan de las Salinas, Puebla, May 17, 1952 (Dawson; AMNH). All figures $\times 1.3$.

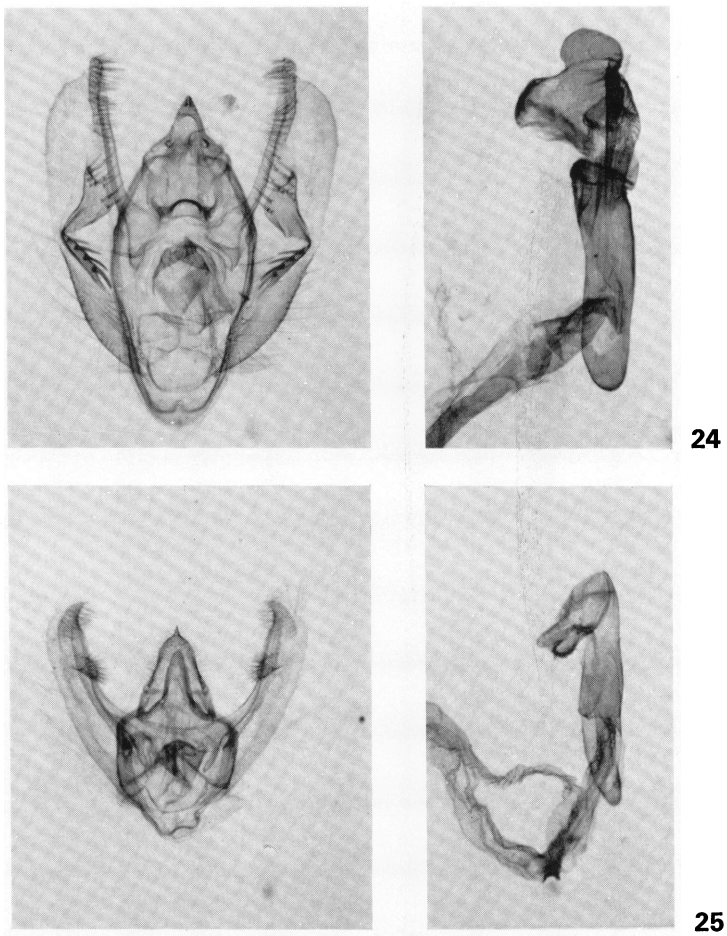
Amphidasis undulosa DRUCE, 1898 (1891–1900), p. 533; 1898 (1881–1900), pl. 98, fig. 26 (holotype male). New synonymy.

DIAGNOSIS: This large species has clearly defined maculation on the upper surface of the wings, including a broad, prominent median band. The length of the forewing ranges from 20 to 24 mm. The genitalia are very distinctive.

MALE: Head, vertex grayish white; front dark brownish black dorsally, shading to grayish white ventrally; palpi with first segment long scaled below, pale buff distally, grayish brown to dark gray basally, second segment laterally flattened, third segment very small, last two grayish brown to grayish black; antennae with about 76 segments, terminal 22 simple, longest pectinations three-fourths length of basal segment, 0.12 mm. in length. Thorax above with mixed whitish gray and pale buff scales and hairlike scales, both collar and patagia basally having whitish gray scales and distally with pale buff hairlike scales, and small, whitish gray posterior tufts; below with anterior portion of prothorax buff, having band of black scales around margin of each eye, remainder of thorax whitish; legs grayish white, having variable number of brown scales, with tarsi grayish black, narrowly pale gray at ends of segments. Abdomen above with first segment white, having anterior overlaying band of grayish black scales, longest medially, remaining segments pale gray with pale brownish gray scaling, with narrow terminal grayish black bands on segments 2 and 3; below grayish white, with posterior segments becoming pale brownish gray.

VENATION: As described for subgenus; forewing with vein R_1 separate.

UPPER SURFACE OF WINGS: Forewings pale gray, basal and outer areas brown or grayish brown, and variable number of brown and brownish black scales; cross lines complete, black, prominent; t. a. line arising on costa one-fifth of distance from base, proceeding at right angle to costa as far as cubital vein, concave to anal vein, then bent basad, meeting inner margin one-fourth of distance from base; median shade line wider than other cross lines, outer margin somewhat diffuse anteriorly, arising about one-third distance from base, shallowly concave to middle of cubital cell, touching or uniting briefly with t. p. line, then curved basad, meeting inner margin about one-fourth of distance from base; discal spot round or elliptical, medially with raised grayish white scales; t. p. line arising on costa about two-thirds of distance from base, broadly curved outwardly to vein M_2, having outward extension to s. t. line, angled inwardly and paralleling outer margin to vein Cu_1, then with large, somewhat irregular concave bend to cell Cu_2, swinging posteriorly, then outwardly to meet middle of inner margin; subterminal area with faint trace of narrow, grayish brown or reddish brown shade band distad of t. p. line, tending to be absent in center of wing; s. t. line grayish white, scalloped, weakly represented or obsolescent; terminal area concolorous with subterminal area, slightly darkened opposite extension of t. p. line on vein M_2; terminal line black or brownish black, interrupted by veins; fringe



FIGS. 24, 25. Male genitalia of *Mericisca* (*Puebla*). 24. *M.* (*P.*) *aztecaria* (Schaus), near Llera, Tamaulipas, June 12, 1970 (W. H. Howe; AMNH). 25. *M.* (*P.*) *parva*, new species, paratype, 16 kilometers southwest of Zapotitlan de las Salinas, Puebla, May 17, 1952 (Dawson; AMNH).

concolorous with wing, having narrow grayish white band basally. Hind wings concolorous with forewings, with basal area pale grayish, contrasting with brownish outer area; median shade band prominent, weakly concave; discal spot small; extradiscal line complete, with strong outward tooth in middle of cell M_1, then angled to anal margin; outer portion of wing similar to that of forewing but with complete terminal line.

UNDER SURFACE OF WINGS: All wings even, grayish white, with cross lines and dorsal spots represented from upper surface; apex of forewings pale buff, set off with diffuse grayish brown or grayish black band of varying thickness; terminal line absent.

LENGTH OF FOREWING: 19 to 22 mm.

FEMALE: Similar to male, but upper surface of wings having more grayish brown and brown scales and strigations, and less contrast between both median area of forewings and basal area of hind and adjacent wing areas. Under surface with more dark gray scaling than in male.

LENGTH OF FOREWING: 22 to 24 mm.

MALE GENITALIA: Uncus with lateral margins constricted medially, and with ventrally curving, truncate or weakly bifurcate apex; socius prominent, in form of pair of sparsely setose, elongate, slender, digitate projections from uncus; gnathos with lateral margins somewhat

S-shaped, with large, median, ventrally projecting, elliptical enlargement; valves with heavily sclerotized valvular area strongly narrowed medially, having thick spines on both ends, and sclerotized sacculus; anellus with posterior portion Y-shaped; vesica with left side more or less sclerotized and striate, right side bulging out and having large spinulose area.

FEMALE GENITALIA: As described for subgenus.

TYPES: Schaus must have had at least two specimens when he described *aztecaria* as the localities Orizaba and Oaxaca, Mexico, are given. The specimen bearing USNM type No. 12477 is a male from Orizaba; this moth is hereby designated as the lectotype. The whereabouts of the Oaxaca cotype is not known to me.

Druce described *undulosa* from a single male specimen; it is in the collection of the British Museum (Natural History).

TYPE LOCALITY: Orizaba, Veracruz, Mexico (for both *aztecaria* and *undulosa*).

DISTRIBUTION: The Mexican states of Veracruz, Puebla, Tamaulipas, and Chiapas.

TIME OF FLIGHT: April and June.

REMARKS: Six specimens (four males, two females) and four genitalic dissections (three males, one female) have been studied.

The basic pattern of maculation of *aztecaria* is quite similar to that of *gracea* Hulst. The two species are easily distinguished, not only by color and by the greater amount of maculation on the under surface of *aztecaria*, but by the subgeneric differences. The genitalia of both sexes of both species are very different.

Mericisca (Puebla) parva, new species

Figures 23, 25

DIAGNOSIS: Similar in maculation to *aztecaria*, but lacking the broad median band of that species. This species is much smaller, having the length of the forewing 14 to 15 mm., compared with 20 to 24 mm. for *aztecaria*. The male genitalia of the two species are very distinctive.

MALE: Head, vertex gray, with black band between bases of antennae; front dark gray; palpi with first segment long scaled below, pale buff distally, dark gray basally, second segment dark gray, and small third segment paler gray; antennae with about 61 segments, terminal 10 simple, longest pectinations one and one-half times as long as basal segment, 0.14 mm. in length. Thorax above dark gray, collar distally and patagia medially with grayish black bands, with grayish black around posterior tufts; below grayish white; legs grayish white, having variable number of grayish brown and grayish black scales, tending to be concentrated on fore and middle legs. Abdomen above grayish brown, with variable amount of brown scaling, tending to become darker posteriorly, first segment having anterior overlaying band of blackish brown scales, with posterior margins of all segments more or less dark; below grayish white.

VENATION: As described for subgenus; R_1 variable in origin, being separate, short- or long-stalked with R_2.

UPPER SURFACE OF WINGS: Forewings gray, having basal and outer areas heavily irrorate with grayish black and brownish scales, with median area less heavily marked; t. a. and t. p. lines black, slender, complete; t. a. line arising on costa one-third of distance from base, evenly curving to meet inner margin near base, with line having more or less prominent, broad, basal shade band; median shade line obsolescent, apparently broadly and evenly curved; discal spot weakly defined, appearing as thickening of median shade band; t. p. line arising on costa two-thirds of distance from base, inwardly oblique into cell, then swinging outwardly to make elongate point in cell M_1, then biconcave to anal vein, swinging outwardly to meet middle of inner margin; subterminal area with brown shading distad of t. p. line anteriorly and posteriorly; s. t. line grayish white, dentate, varying from complete to obsolescent; terminal area concolorous with subterminal area, or becoming darker opposite outward point of t. p. line; terminal line black, narrow; fringe dark gray basally, paler gray distally, and narrowly grayish white opposite vein endings. Hind wings concolorous with forewings, with basal area slightly paler than outer area; intradiscal line obsolescent or absent; discal dot small; extradiscal line complete, narrow, with outward band or tooth in cell M_1, then proceeding somewhat irregularly to anal margin; outer portion of wing similar to that of forewing.

UNDER SURFACE OF WINGS: All wings grayish white, or having faint buff tinge; forewings with maculation reflected from upper surface in upper and outer portions of wing; hind wings varying from immaculate to having weakly represented discal dot and extradiscal line; grayish

black terminal line present on all wings.

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

FEMALE: Unknown.

MALE GENITALIA: Uncus bell-like in outline, with apex having short, posteriorly directed spine; socius absent; gnathos very elongate, tapering to blunt point; valves with raised, sac-like, terminally setose valvular process; anellus with posterior extension T-shaped; vesica, when exserted, extending dorsally, with short, broad, anteriorly directed lobe with blunt, scobinate end, and narrow, slightly curving sclerotized ridge extending to left side.

FEMALE GENITALIA: Unknown.

TYPES: Holotype, male, 16 km. southwest of Zapotitlan de las Salinas, Puebla, Mexico, May 17, 1952 (Dawson). The genitalia of the holotype are mounted on slide FHR 10077. Paratypes, all from Mexico: same data as holotype, two males; Huajuapan, Oaxaca, May 16, 1952 (Dawson), one male.

All the type material is in the collection of the American Museum of Natural History.

DISTRIBUTION: The mountainous areas of Puebla and Oaxaca. Huajuapan (or Huajuapan de León) is at about 5500 feet in elevation.

TIME OF FLIGHT: May.

REMARKS: Four male specimens and three genitalic dissections have been studied.

ETYMOLOGY: The specific name is from the Latin *parvus*, small.

SUBGENUS *PARAPHEROMIA* McDUNNOUGH, NEW STATUS

Parapheromia McDUNNOUGH, 1920, p. 17; 1938, p. 163.

DIAGNOSIS: The antennae of the males have their longest pectinations 0.4 to 0.5 mm. in length; the female antennae are simple. The male genitalia have two large spinose areas on the inner face of the valves and lack a sclerotized gnathos. The female genitalia have the sterigma with large, smoothly sclerotized lateral plates and a sclerotized transverse band posteriad of the ostium; the corpus bursae is straight and shorter than that found in *Mericisca*.

ADULTS: Head with front varying from flat, smooth, and level with eyes to raised and swollen medially; antennae of male with from about 45 to 51 segments, terminal five to 10 simple, with longest pectinations two to three times as long as basal segments, and from 0.4 to 0.5 mm. in length; antennae of female simple. Thorax with foreleg not having spinose projection; hind leg of male with hair pencil and groove. Abdomen with row of setae in male on ventral surface of third segment. Forewings with either 12 or 11 veins, with or without areole.

MACULATION: Of two types: one with prominent, complete cross lines on upper surface of wings, and distinct pattern; the second with less discernible cross lines, tending to have even, overall pattern.

MALE GENITALIA: Uncus with broad base, sharply constricted medially, with elongate, digitate apical section curving ventrally and having rounded apex; socius absent; gnathos membranous; valves with elongate, apical setose area, with two, large, heavily sclerotized spinose areas on inner face, and with raised, sclerotized ridge along sacculus; anellus with slender, sclerotized posterior extension longer than basal, anterior area, terminally curving dorsally; aedeagus slender, longer than combined lengths of uncus, tegumen, and saccus; vesica unarmed.

FEMALE GENITALIA: Moderately elongate; sterigma with ostium completely surrounded by smoothly sclerotized areas, without sclerotized median area; ductus bursae small, slender; ductus seminalis arising ventrally as small sac, with tube leading off therefrom; corpus bursae with slender, rather long, posterior portion, with enlarged anterior bulbous area; signum small, with anterolateral margins extended. Apophyses posteriores 2.0 to 2.9 mm. in length.

EARLY STAGES: Unknown.

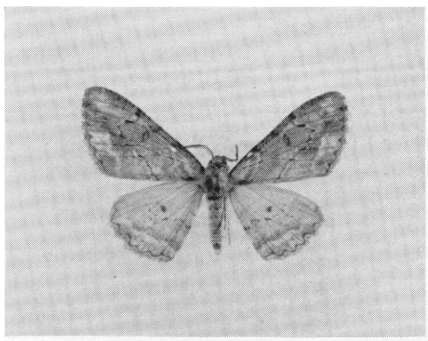
FOOD PLANTS: Unknown.

TYPE SPECIES: *Alcis lichenaria* Pearsall; by original designation.

DISTRIBUTION: The states of Colorado, Arizona, New Mexico, and western Texas in the United States, and extending southward into Mexico as far as the State of Pueblo.

REMARKS: The species of this subgenus are easily recognized by the genitalic structures of both sexes. Specific differences are usually rather small and subtle. It is interesting that the two types of pattern and maculation found in the subgenus *Mericisca* are repeated here but they are not so clearly differentiated.

Seven species are included in this subgenus. The first four (*gicaria*, *elpidata*, *cassinoi*, and *lichenaria*) tend to have less clearly defined cross lines and an even, overall pattern. The other



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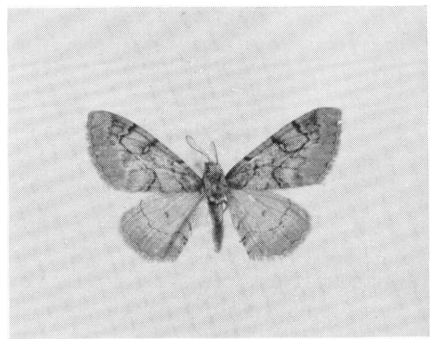

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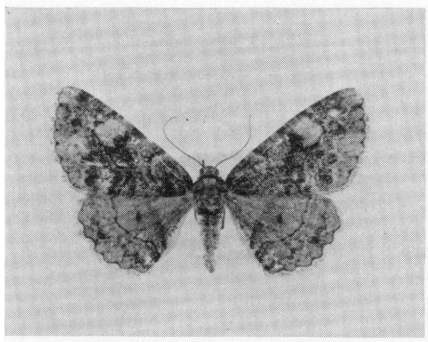

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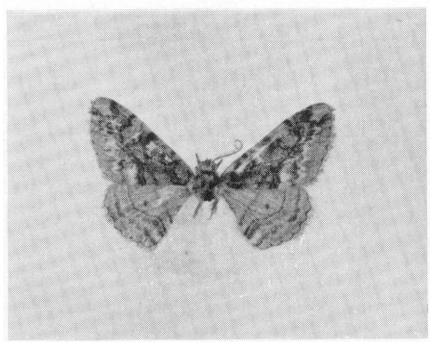

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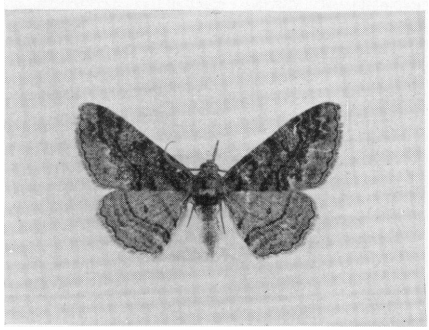

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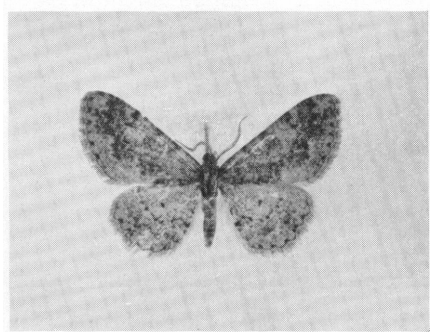

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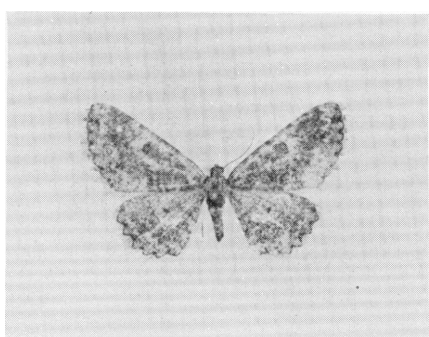

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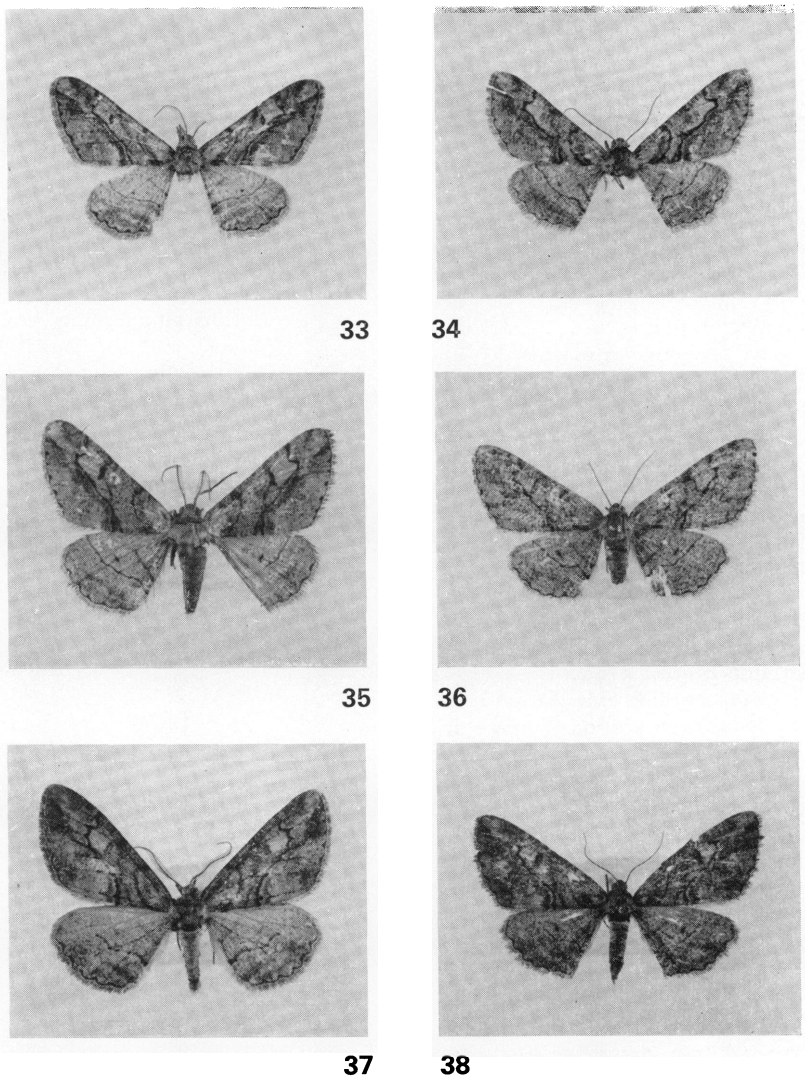


FIGS. 33–38. Adults of *Mericisca* (*Parapheromia*). 33, 34. *M.* (*P.*) *ficta*, new species. 33. Holotype male, McMillan Camp, New Mexico, July 17, 1961 (F., P., and J. Rindge; AMNH). 34. Allotype female, Sunnyside, Arizona, July 11, 1958 (L. M. Martin; LAM). 35, 36. *M.* (*P.*) *configurata* (Hulst). 35. Holotype male, Colorado (AMNH). 36. Female, Mesa del Huracan, Chihuahua, July 21–25, 1964 (J. E. H. Martin; CNC). 37, 38. *M.* (*P.*) *falsata* (McDunnough). 37. Male, south fork, Little Colorado River, Arizona, June 28, 1947 (G. H. and J. L. Sperry; AMNH). 38. Female, Hannagen Meadows, Arizona, June 21, 1967 (R. F. Sternitzky; AMNH). All figures × 1.3.

FIGS. 26–32. Adults of *Mericisca* (*Parapheromia*). 26. *M.* (*P.*) *gicaria* (Schaus), male, Tehuacan, Puebla, September 22, 1937 (C. C. Hoffmann; AMNH). 27, 28. *M.* (*P.*) *elpidata* (Dyar). 27. Male, Tehuacan, Puebla, September 23, 1937 (C. C. Hoffmann; AMNH). 28. Female, same data, September, 1937 (C. C. Hoffmann; AMNH). 29, 30. *M.* (*P.*) *cassinoi* (McDunnough). 29. Holotype male, Paradise, Arizona, August, 1925 (O. C. Duffner, CNC). 30. Paratype female, "So. Tex.," Oct. 1–15 (CNC). 31, 32. *M.* (*P.*) *lichenaria* (Pearsall). 31. Male, Bear Trap Camp, New Mexico, July 7, 1965 (F., P., and M. Rindge; AMNH). 32. Female, same data, July 19, 1964. All figures × 1.3.

three (*ficta*, *configurata*, and *falsata*) have a more distinct pattern and prominent, complete cross lines on the upper surface of the wings.

KEY TO SPECIES

Based on Maculation and Distribution

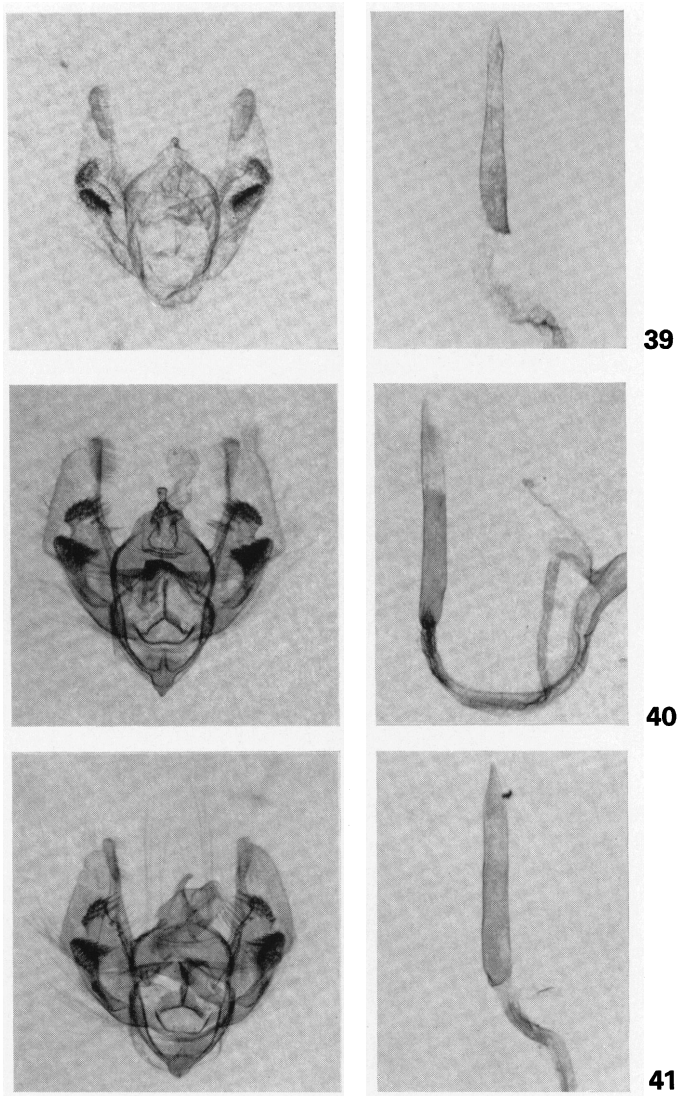
1. Upper surface of forewings mottled gray and blackish brown, usually with prominent ochraceous area between discal dot and poorly defined t. p. line . . . . *lichenaria*
   Upper surface of forewings not mottled and usually with clearly defined t. p. line . . 2
2(1). Upper surface of forewings with t. p. line having deep basal bend above inner margin . . . . . *elpidata*
   Upper surface of forewings with t. p. line slightly curved or almost straight above inner margin 3
3(2). Upper surface of forewings mainly reddish brown, with large grayish white area at about middle of outer margin . . . *gicaria*
   Upper surface of forewings darker brown, without outer whitish area 4
4(3). Forewings with t. p. line enlarged on veins, particularly in upper portion of wing . . . . . *falsata*
   Forewings with t. p. line not enlarged on veins 5
5(4). Smaller species, with length of forewing 12 to 15 mm., with upper surface of forewings mostly brownish black, tending to have maculation poorly defined; forewings usually with 11 veins . . . . . *cassinoi*
   Larger species, with length of forewing 14 to 19 mm., with paler forewings, having clearly defined maculation; forewings with 12 veins 6
6(5). Smaller species, with length of forewing 14 to 16 mm.; east and west of continental divide in Cochise County, Arizona, and New Mexico . . . . . *ficta*
   Larger species, with length of forewing 15 to 19 mm.; continental divide in Colorado, New Mexico, Arizona, and south into Chihuahua and Durango . . . . *configurata*

Based on Male Genitalia

1. Process of sacculus with apical portion triangular, with length being almost as great as width . . . . . *falsata*
   Process of sacculus with apical portion elongate, with length being at least twice as great as width 2
2(1). Aedeagus 1.6 to 1.7 mm. in length 3
   Aedeagus 1.8 to 2.0 mm. in length 6
3(2). Process of valvula with inner surface evenly covered with many short, thick spines distally and with many, longer, more slender setae posteromedially . . *lichenaria*
   Process of valvula with inner surface not as above 4
4(3). Costa with apical setose area 0.40 to 0.45 mm. in length. . . . . *gicaria*
   Costa with apical setose area 0.30 to 0.35 mm. in length. 5
5(4). Anellus tending to be quadrate, with posterior margins forming broad, obtuse angle . . . . . *cassinoi*
   Anellus tending to be slightly smaller and more triangular, with posterior margins forming slightly more than right angle . . . . . *elpidata*
6(2). Apical portion of process of sacculus tending to be larger, averaging about 0.38 mm. long by 0.19 mm. wide, and somewhat tapering distally . . . . . *configurata*
   Apical portion of process of sacculus tending to be smaller, averaging about 0.35 mm. long by 0.14 mm. wide, and to be of more or less even width . . . . . *ficta*

Based on Female Genitalia

1. Sterigma with posterior margin of sclerotized area flatly W-shaped 2
   Sterigma with posterior margin of sclerotized area smoothly rounded or straight . . . 4
2(1). Corpus bursae 3.5 mm. in length, tending to gradually increase in width anteriorly . . . . . *gicaria*
   Corpus bursae 4.1 to 4.5 mm. in length, tending to have sharply swollen anterior end 3
3(2). Sterigma with raised, shallowly V-shaped flange anteriad of ostium . . . . *elpidata*
   Sterigma without raised anterior flange . . . . . *cassinoi*
4(1). Corpus bursae 3.2 to 3.7 mm. in length . . . . . *lichenaria*
   Corpus bursae about 4.6 mm. in length . . 5
5(4). Sterigma with sclerotized lateral areas sharply concave, rugose, each almost as wide as median area and separated from latter by raised ridge . . . . . *ficta*
   Sterigma with sclerotized lateral areas barely concave or flat, smoothly sclerotized, wider in relation to median area, separated from latter by weaker, not raised, ridge . . . 6
6(5). Sterigma with narrow, weakly sclerotized band anteriad of ostium . . . *configurata*
   Sterigma with broad (about 0.2 mm.) smoothly sclerotized band anteriad of ostium . . . . . *falsata*



FIGS. 39–41. Male genitalia of *Mericisca* (*Parapheromia*). 39. *M.* (*P.*) *gicaria* (Schaus), Tehuacan, Puebla, September 14, 1925 (C. C. Hoffmann; AMNH). 40. *M.* (*P.*) *elpidata* (Dyar), Aguascalientes, Aguascalientes, August 18, 1953 (C. and P. Vaurie; AMNH). 41. *M.* (*P.*) *cassinoi* (McDunnough), Paradise, Arizona, August, 1940 (AMNH).

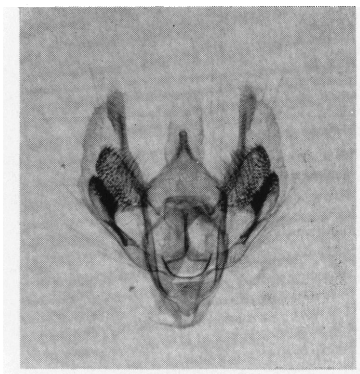
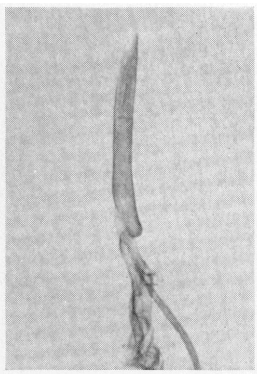
Mericisca (*Parapheromia*) *gicaria* (Schaus), emendation and new combination

Figures 26, 39, 46

Boarmia giacria SCHAUS, 1901, p. 248.

DIAGNOSIS: This species has clearly defined maculation on the upper surface of the forewings, although the cross lines are thin and not prominent; the hind wings are much paler than the primaries. The latter are reddish brown and have a large grayish white area at the middle of the outer margin.

MALE: Head, vertex gray, becoming dark grayish brown between bases of antennae; front flat, smooth, level with eyes, dark grayish brown dorsally, turning gray ventrally; palpi with first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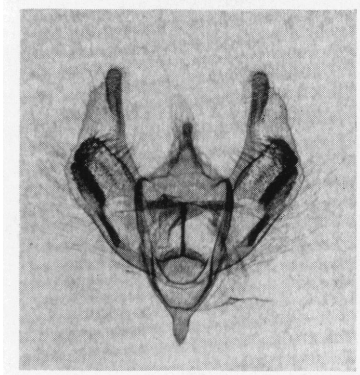
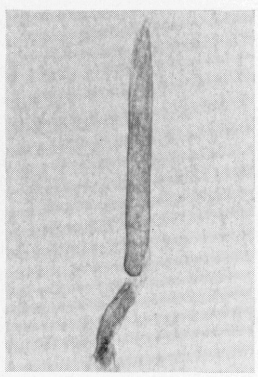
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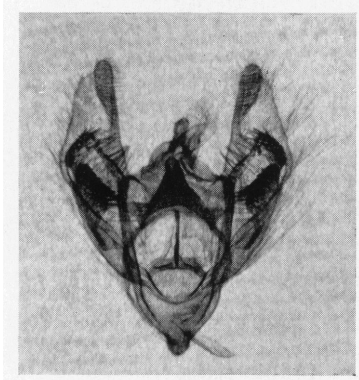
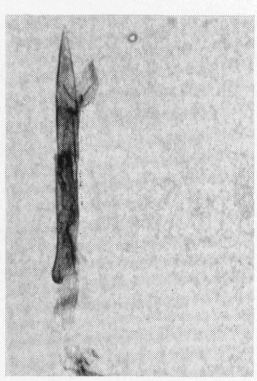
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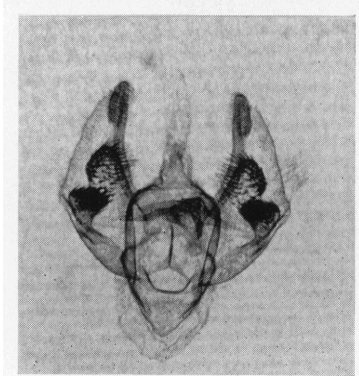
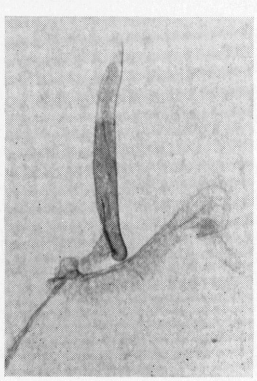
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segment long scaled below, grayish white, becoming grayish black distally, second and third segments laterally flattened, grayish black; antennae of about 50 segments, with terminal eight simple, longest pectinations two and one-half times as long as basal segment, 0.50 mm. in length. Thorax above pale gray, collar with apical one-third grayish brown, patagia with variable number of brown hairlike scales, posterior tufts dark brown; below pale grayish white, some grayish brown scaling anteriorly; legs grayish white, having variable amount of brownish black scaling on outer surface, tarsi with ends of segments pale. Abdomen above with first segment brown, having anterior overlaying band of black scales, remaining segments grayish brown or pale brownish gray, with variable number of dark gray and grayish black scales, and narrow, pale grayish white terminal bands on all segments; below grayish white.

VENATION: Forewings with 12 veins, R_{1+2} stalked at origin, with R_1 uniting briefly with Sc, then free to costa; with or without areole.

UPPER SURFACE OF WINGS: Forewings reddish brown, portions of basal and outer parts of wing grayish white, and black or brownish black scaling in middle of wing distad of t. p. line; cross lines black, slender, in some cases only one scale wide; basal area grayish white, with broad, diffuse, dark grayish brown or reddish brown band basad of t. a. line; latter arising on costa about one-third of distance from base, swinging outward across radial vein, then curving basally to meet inner margin one-fifth of distance from base; median line represented on costa by spot midway between other cross lines, then becoming obsolescent; discal spot round or elliptical, large; t. p. line arising on costa about five-eighths of distance from base, with slight basal bend to vein M_1, extending outward to vein M_2, then roughly paralleling costa, with slight to moderate points on veins, meeting inner margin at middle; subterminal area with brown shade band distad of t. p. line in lower portion of wing, and large black or brownish black patch in center of wing; t. p. line grayish white, present in lower portion of wing, joining large grayish white patch in terminal area at middle of outer margin, represented in some specimens below apex; terminal area tending to be reddish brown or dark brown opposite cell; terminal line narrow, dark, enlarged in cells; fringe checkered, with about four brownish black intravenular areas anteriorly, tending to be pale gray opposite veins particularly in lower portion of wing. Hind wings paler than forewings, light gray, with numerous brown and reddish brown scales; intradiscal line obsolescent; discal spot small, grayish black; extradiscal line absent at costal margin, roughly S-shaped to anal margin; s. t. line a rather broad, grayish white band, shaded basally by grayish black, in terminal area by reddish brown; terminal line complete, narrow; fringe concolorous with wing.

UNDER SURFACE OF WINGS: Pale gray; forewings with variable amount of gray and grayish buff scaling, costa darkened, with apical portion of wing grayish brown in some specimens; t. p. line present on forewings, with discal dots on all wings; terminal line absent.

LENGTH OF FOREWING: 14 to 16 mm.

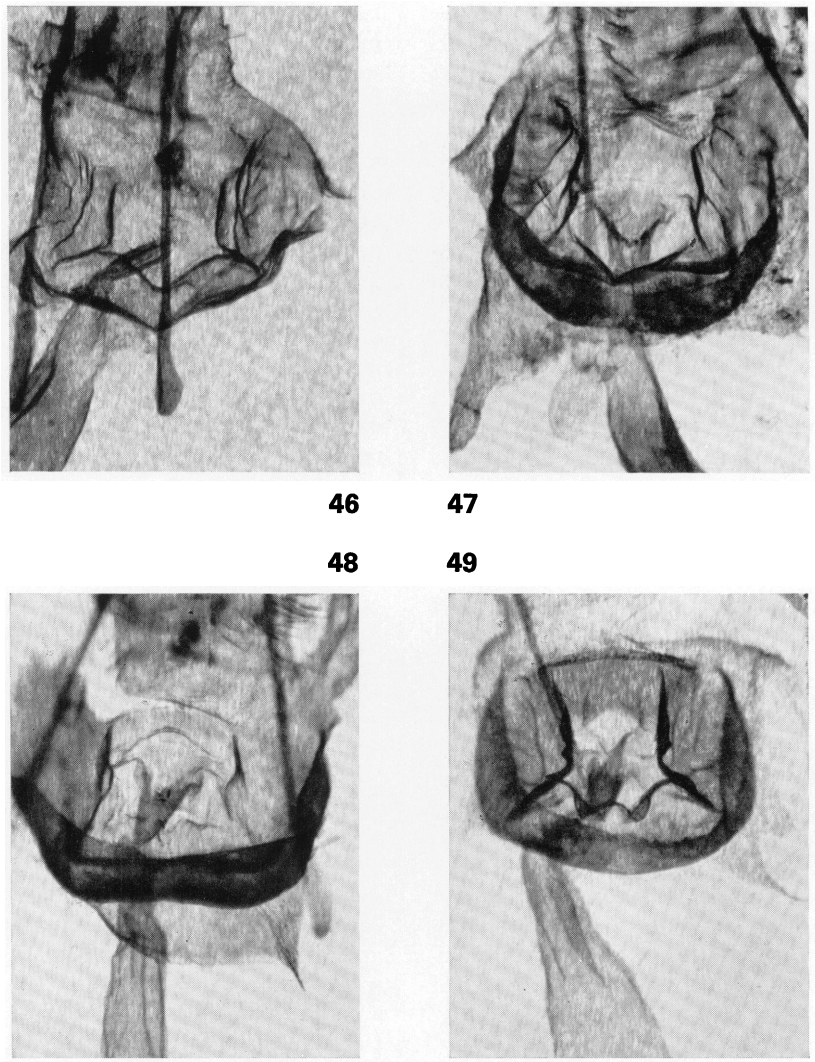
FEMALE: Similar to male (as far as can be told from single, worn specimen).

LENGTH OF FOREWING: 16 mm.

MALE GENITALIA: Uncus with triangular base about 0.35 mm. across, with digitate apical section rounded and of equal width; valve slender, apical setose area 0.42 to 0.46 mm. in length, with spinose valvular area enlarged apically, having spines along swollen dorsomedial margin, and elongate, saccular spinose area 0.3 to 0.4 mm. in length; anellus with truncate posterior margin; aedeagus tapering posteriorly, 1.6 to 1.8 mm. in length.

FEMALE GENITALIA: Sterigma with posterior margin of sclerotized area W-shaped, lateral areas large, rugose, separated by raised ridge, posterior strip smoothly sclerotized, of even width, caudally angled, anterior margin with raised ridge, curving anteriad medially; ductus bursae 0.2 mm. in length, narrow, widely sclerotized; corpus bursae 3.55 mm. in length, gradually increasing in width anteriorly; signum about 0.3 mm. wide and 0.2 mm. long. Apophy-

FIGS. 42–45. Male genitalia of *Mericisca* (*Parapheromia*). 42. *M.* (*P.*) *lichenaria* (Pearsall), Bear Trap Camp, New Mexico, July 6, 1965 (F., P., and M. Rindge; AMNH). 43. *M.* (*P.*) *ficta*, new species, holotype, McMillan Camp, New Mexico, July 17, 1961 (F., P., and J. Rindge; AMNH). 44. *M.* (*P.*) *configurata* (Hulst), Alpine Divide Camp, Arizona, July 17, 1965 (F., P., and M. Rindge; AMNH). 45. *M.* (*P.*) *falsata* (McDunnough), McMillan Camp, New Mexico, July 24, 1961 (F., P., and J. Rindge; AMNH).



FIGS. 46–49. Female genitalia of *Mericisca* (*Parapheromia*), showing sterigma, ductus bursae, and adjacent areas. 46. *M.* (*P.*) *gicaria* (Schaus), Cuernevaca, Morelos, August, 1906 (USNM). 47. *M.* (*P.*) *elpidata* (Dyar), Tehuacan, Puebla, September, 1937 (C. C. Hoffmann; AMNH). 48. *M.* (*P.*) *cassinoi* (McDunnough), 63 miles west of Santa Barbara, Chihuahua, July 20, 1947 (W. Gertsch and M. Cazier; AMNH). 49. *M.* (*P.*) *ficta*, new species, allotype, Sunnyside, Arizona, July 11, 1958 (L. M. Martin; LAM).

ses posteriores 2.7 mm. in length.

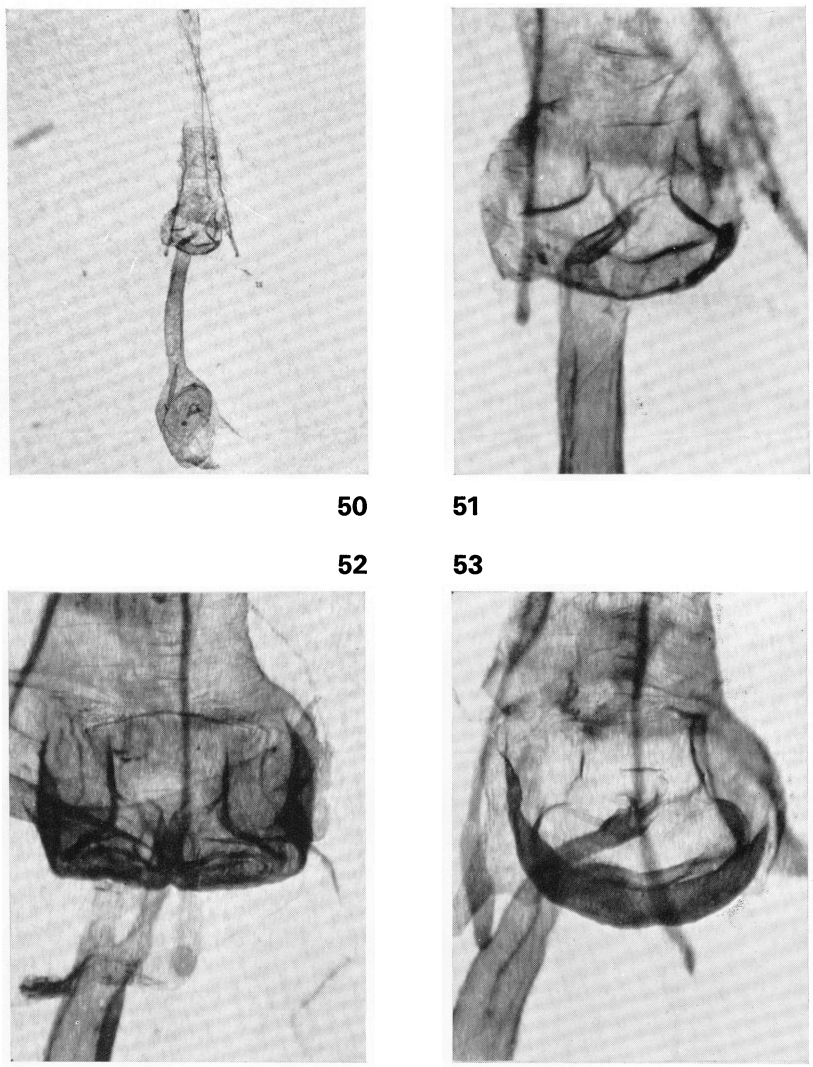
TYPE: Schaus did not state how many specimens he had when he described this species; presumably it was but one as only one measurement for wing expanse is given. The holotype is a male, USNM 14273, with its genitalia on slide DCF 1465.

TYPE LOCALITY: Guadalajara, Jalisco, Mexico.

DISTRIBUTION: The mountains of central Mexico, occurring in the states of Jalisco, Morelos, and Puebla. The moths have been captured at elevations of from about 5200 to 7400 feet.

TIME OF FLIGHT: May, July, August, and September.

REMARKS: Twelve specimens (11 males, one female) and five genitalic dissections (four



FIGS. 50–53. Female genitalia of *Mericisca* (*Parapheromia*), showing sterigma, ductus bursae, and adjacent areas. 50, 51. *M.* (*P.*) *lichenaria* (Pearsall), Hidden Springs Canyon, Arizona, July 5, 1964 (R. F. Sternitzky; AMNH). 52. *M.* (*P.*) *configurata* (Hulst), Mesa del Huracan, Chihuahua, July 21–25, 1964 (J. E. H. Martin; CNC). 53. *M.* (*P.*) *falsata* (McDunnough), Alpine Divide Camp, Arizona, July 16, 1965 (F., P., and M. Rindge; AMNH).

males, one female) have been studied, including the type and its genitalia.

I believe that the specific name was incorrectly printed in the original description. There are two reasons for this opinion. The first is that Schaus's holographic type label reads "*Boarmia gicaria* Schs. Type"; in addition, this specific name was also spelled *gicaria* on a specimen from the collection of C. C. Hoffmann, now in the American Museum of Natural History. The second reason is that Schaus used the suffix *-aria* very often. In the paper in which the original description of this species appears, Schaus named 149 new species; of these (excluding "*giacria*"), 56 of the names terminate in *-aria*. Accordingly, I have changed the spelling of the specific name to *gicaria*.

The type is the only specimen seen from

Jalisco. This specimen is somewhat faded and rubbed, so it is difficult to make meaningful comparisons. On the type, as compared with a series of five males from Puebla, the maculation is not so clearly differentiated, the discal dot of the forewing appears larger, and the t. p. line more irregular in course; the hind wing has a more strongly represented intradiscal line and more dark scaling. It is believed that these are probably individual differences, as the male genitalia of the type and of Puebla specimens match each other very well.

Mericisca (*Parapheromia*) *elpidata* (Dyar), new combination

Figures 27, 28, 40, 47

Alcis elpidata DYAR, 1912, p. 93.
Alcis interbrunnea DYAR, 1912, p. 93. New synonymy.

DIAGNOSIS: This species can be recognized by the very strongly incurved t. p. line in the lower portion of the forewing, by the large, brown, quadrate costal area between the median line-discal dot and the t. p. line, and by the brown terminal area on all wings above in the male.

MALE: Head, vertex gray or grayish brown; front flat, smooth, level with eyes, varying from pale gray to brownish gray; palpi with first segment long scaled below, grayish buff, second segment laterally flattened, grayish black, third segment grayish black or with some pale gray scaling; antennae of about 50 segments, terminal six simple, longest pectinations two and one-half times as long as basal segment, 0.42 mm. in length. Thorax above varying from pale to dark gray, both outer portions of collar and patagia with some grayish brown or brown hairlike scales, and posterior tufts brownish black; below pale grayish white, having some grayish brown scaling anteriorly; legs grayish white, with variable amount of brownish black on outer surface, fore- and mid-tarsi with ends of segments pale. Abdomen above with first segment tending to be brownish, having anterior overlaying band of black and brownish black scales, remaining segments grayish or grayish brown, with a few scattered darker scales; below grayish white.

VENATION: Forewings of most specimens with 11 veins, without areole; some specimens with 12 veins, R_{1+2} being long stalked, some with weakly defined areole.

UPPER SURFACE OF WINGS: Forewings gray, with numerous grayish black and brown scales, the latter concentrated in large, quadrate costal area between median line-discal dot, and t. p. line, and in terminal area; cross lines black, prominent; basal area brown, with broad, diffuse shade band basad of t. a. line; latter arising on costa one-fourth of distance from base, broadly outcurved in cell, then paralleling costa to meet inner margin about one-fifth of distance from base; median area tending to be somewhat paler gray than remainder of wing; median line arising at middle of costa, running outward to elongate, pale centered, elliptical discal spot and into t. p. line, reappearing as spot on cubital vein and proceeding to about middle of inner margin; t. p. line arising on costa two-thirds of distance from base, outwardly curved around cell, outlining large, brown costal area, then swinging sharply basad to cell Cu_2, then curving outward to meet inner margin about three-fourths distance from base; subterminal area grayish black, divided medially by pale gray, at least in lower part of wing, thus forming dark shade bands along t. p. and s. t. lines; latter grayish white, more or less complete, somewhat irregular in course; terminal area brown, broad; terminal line varying from obsolescent to complete, slender, with small intravenular enlargements; fringe concolorous with wings, some specimens with a few gray scales at ends of veins. Hind wings paler than forewings, light gray, with variable number of grayish black and brown scales, with terminal area brown; intradiscal line either obsolescent or weakly represented, straight; discal spot small, black; extradiscal line narrow, complete, curving or angled across wing; s. t. line obsolescent, represented by change in color from grayish black subterminal area to brown terminal area; terminal line slightly more strongly represented than on forewings; fringe concolorous with wing.

UNDER SURFACE OF WINGS: Grayish white; forewings with apical area broadly but variably marked with grayish black and brown scales, and with t. p. line present in upper portion of wing; discal spots present on all wings, that on forewing larger and more prominent than one on hind wing; terminal line absent.

LENGTH OF FOREWING: 14 to 16 mm.

FEMALE: Similar to male but with both upper and lower surfaces of wings more heavily suffused with black and grayish black scales, tending to obscure most of maculation; large

quadrate costal spot of forewings present but grayish brown; outer margins of all wings grayish black, rarely partially brown, with grayish area in middle of outer margin of forewings.

LENGTH OF FOREWING: 16 to 18 mm.

MALE GENITALIA: Similar to those of *gicaria*, differing mainly as follows: uncus with wider base, 0.38 to 0.43 mm. across, due in part to more sloping posterior margins of tegumen, and with digitate apical section very slightly enlarged and flattened apically; valve broader, apical setose area shorter, 0.28 to 0.34 mm. in length, with spinose valvular area with concave outer margin anteriad of apex, and having fewer spines along straighter dorsomedial margin, and with elongate, saccular spinose area tending to have slightly longer spines anteriorly; anellus more or less triangular, with posterior margins forming from 110 to 130 degree angle; aedeagus 1.6 to 1.8 mm. in length.

FEMALE GENITALIA: Sterigma with sclerotized area surrounding ostium, laterally broad and either with several rugae or smoothly sclerotized, anteriorly with raised, shallowly V-shaped ridge, and posteriorly smoothly sclerotized and convex; ductus bursae very short, scarcely differentiated from corpus bursae; ductus seminalis arising from rather large rounded sac; corpus bursae about 4.3 mm. in length, posterior portion elongate, slender, distal end with a few longitudinal striations, and with swollen anterior end; signum about 0.3 mm. wide and 0.1 mm. long. Apophyses posteriores 2.4 to 2.5 mm. in length.

TYPES: Dyar described *elpidata* from a single female; it is USNM 14230, and its genitalia are mounted on slide DCF 1469.

In describing *interbrunnea*, Dyar had 34 male cotype specimens. The lectotype is hereby designated as the specimen bearing Dyar's handwritten type label; it is USNM 14231, and its genitalia are mounted on slide DCF 1466.

TYPE LOCALITY: Tehuacan, Puebla, Mexico (for both *elpidata* and *interbrunnea*).

DISTRIBUTION: The foothills and mountains of Mexico, being known from the states of Puebla, Guerrero, Guanajuato, Aguascalientes, Durango, and Coahuila. The moths have been collected at elevations of from 2400 to 7000 feet.

TIME OF FLIGHT: May, June, August, and September.

REMARKS: Fifty-eight specimens (52 males, six females) and 10 genitalic dissections (seven males, three females) have been examined, including both primary types and their genitalia.

Mericisca (Parapheromia) cassinoi (McDunnough), new combination

Figures 29, 30, 41, 48, 54

Parapheromia cassinoi MCDUNNOUGH, 1927, p. 277; 1938, p. 163.

DIAGNOSIS: This species has the upper surface of the forewings darker brown than does *elpidata*, it lacks the very deep basal bend in the lower portion of the t. p. line of the preceding species and has more white scaling in the tornal area.

MALE: Head, vertex dark gray or grayish black, some scales pale gray distally; front flat, smooth, level with eyes, grayish black, tending to become grayish ventrally; palpi with first segment moderately long scaled below, with mixed grayish buff and grayish black scales, second segment grayish black, third segment gray; antennae of about 46 segments, terminal 10 simple, longest pectinations three times as long as basal segment, 0.45 mm. in length. Thorax above varying from gray to grayish black, posterior tufts black; below white or grayish white, having some grayish brown scaling anteriorly; legs grayish white, with variable amount of brownish black scaling on outer surface, tarsi having ends of segments broadly paler. Abdomen above grayish brown, with first segment having anterior overlaying band of black scales; below grayish white.

VENATION: Forewings usually with 11 veins and without areole; rarely with 12 veins, R_{1+2} being long stalked, with R_1 weakly represented.

UPPER SURFACE OF WINGS: Forewings brown or grayish brown, with numerous black scales obscuring cross lines, having variable amount of white scaling in subterminal area above inner margin, terminal area brown; cross lines black, not prominent, course as in *elpidata* but with much less of basal bend in t. p. line in lower part of wing; large, quadrate costal area present basad of t. p. line, concolorous with median area in most specimens, in some slightly browner; discal spot elliptical, with a few raised grayish white scales in middle; subterminal area mostly concolorous with basal portion of wing, but with variable number of white scales posteriorly in row perpendicular to inner margin; s. t. line

white, present in at least lower part of wing; terminal area brown, variable, suffused with black scales; terminal line black, complete, with small intravenular enlargements; fringe concolorous with wing, tending to be slightly paler basally and opposite vein endings. Hind wings paler than forewings, gray, becoming more heavily suffused with black and brown scales distally; intradiscal line extending straight across wing; discal spot small, black; extradiscal line complete, subparalleling outer margin, with basal bend near anal margin; subterminal area grayish black, with incomplete grayish white band down center; s. t. line grayish white, varying from being straight to crenulate; terminal area narrow, brown; terminal line and fringe similar to those of forewings.

UNDER SURFACE OF WINGS: Grayish white; forewings with variable amount of grayish brown scaling in apical area, apex grayish buff; cross lines and discal spots represented on all wings.

LENGTH OF FOREWING: 13 to 15 mm.

FEMALE: Similar to male but with both upper and under surfaces of wings more heavily suffused with black scales, tending to obscure nearly all maculation; s. t. line partially represented on upper surface of all wings in some specimens.

LENGTH OF FOREWING: 13 to 16 mm.

MALE GENITALIA: Very similar to those of *elpidata*, differing mainly as follows: slightly smaller; anellus quadrate, with posterior margins forming angle of from 150 to 180 degrees.

FEMALE GENITALIA: Very similar to those of *elpidata*, differing mainly as follows: sterigma with lateral areas smoothly sclerotized and with anterior, raised, shallowly V-shaped ridge reduced or absent, with larger lightly sclerotized area anteriad of ostium with lateral margins tending to be acutely pointed; ductus bursae more clearly differentiated, tapering anteriorly; corpus bursae 4.1 to 4.5 mm. in length; signum varying in size from 0.24 to 0.32 mm. in width, and 0.14 to 0.22 mm. in length. Apophyses posteriores 2.3 to 2.7 mm. in length.

TYPES: McDunnough described *cassinoi* from a holotype male, an allotype female, and 16 male and six female paratypes. The holotype is CNC 2598; its genitalia are mounted on slide FHR 16306. The allotype is in the Museum of Comparative Zoology, Harvard University. The paratypes represent three species in two genera, with all the incorrectly determined ones originating in the Cassino collection. The following paratypes have been examined and determined by me as follows: *Parapheromia cassinoi* McDunnough; Jemez Springs, New Mexico, one male (MCZ); McNary, Arizona, three males (MCZ, CNC); Paradise, Arizona, one male (CNC); "S. Texas," one male, one female (CNC). *Stenoporpia vernata vernata* (Barnes and McDunnough): Jemez Springs, New Mexico, one male and three females (MCZ; see Rindge, 1968, p. 106), one male and one female (USNM). *Stenoporpia anastomosaria* (Grossbeck): Alpine, Texas, one male (MCZ).

TYPE LOCALITY: Paradise, Chiricahua Mountains, Cochise County, Arizona.

DISTRIBUTION: Southern and eastern Arizona and western Texas in the United States (fig. 54); southern Chihuahua in Mexico, at an elevation of 5500 feet in the Sierra Madre de Occidental. There are two males in the MCZ labeled "Laguna Beach, Calif., Nov. 1-15"; these specimens are incorrectly labeled.

TIME OF FLIGHT: From late June until early October.

REMARKS: Forty-six specimens (32 males, 14 females) and 17 genitalic dissections (12 males, five females) have been studied, including both the holotype (and its genitalia) and allotype.

Mericisca (*Parapheromia*) *lichenaria* (Pearsall), new combination

Figures 31, 32, 42, 50, 51, 54

Alcio [*sic*] *lichenaria* PEARSALL, 1906, p. 215.

Cleora lichenaria: BARNES AND MCDUNNOUGH, 1917, p. 118.

Parapheromia lichenaria: MCDUNNOUGH, 1920, p. 18, pl. 2, fig. 8 (male genitalia), pl. 7, fig. 3 (male), pl. 9, fig. 3 (male antenna), pl. 11, fig. 2 (venation); 1938, p. 163.

DIAGNOSIS: This species can be separated from *cassinoi* by the fact that the upper surface of the forewings is mostly brown to grayish black, obscuring the cross lines. Good genitalic differences are present between these two species; see keys for details.

MALE: Head, vertex dark gray; front flat, smooth, level with eyes, dark gray; palpi with first segment long scaled below, with mixed buff and gray scales, terminal two segments tending to be gray; antennae of about 48 segments, with terminal five to eight simple, longest pectinations two and one-half times as long as basal

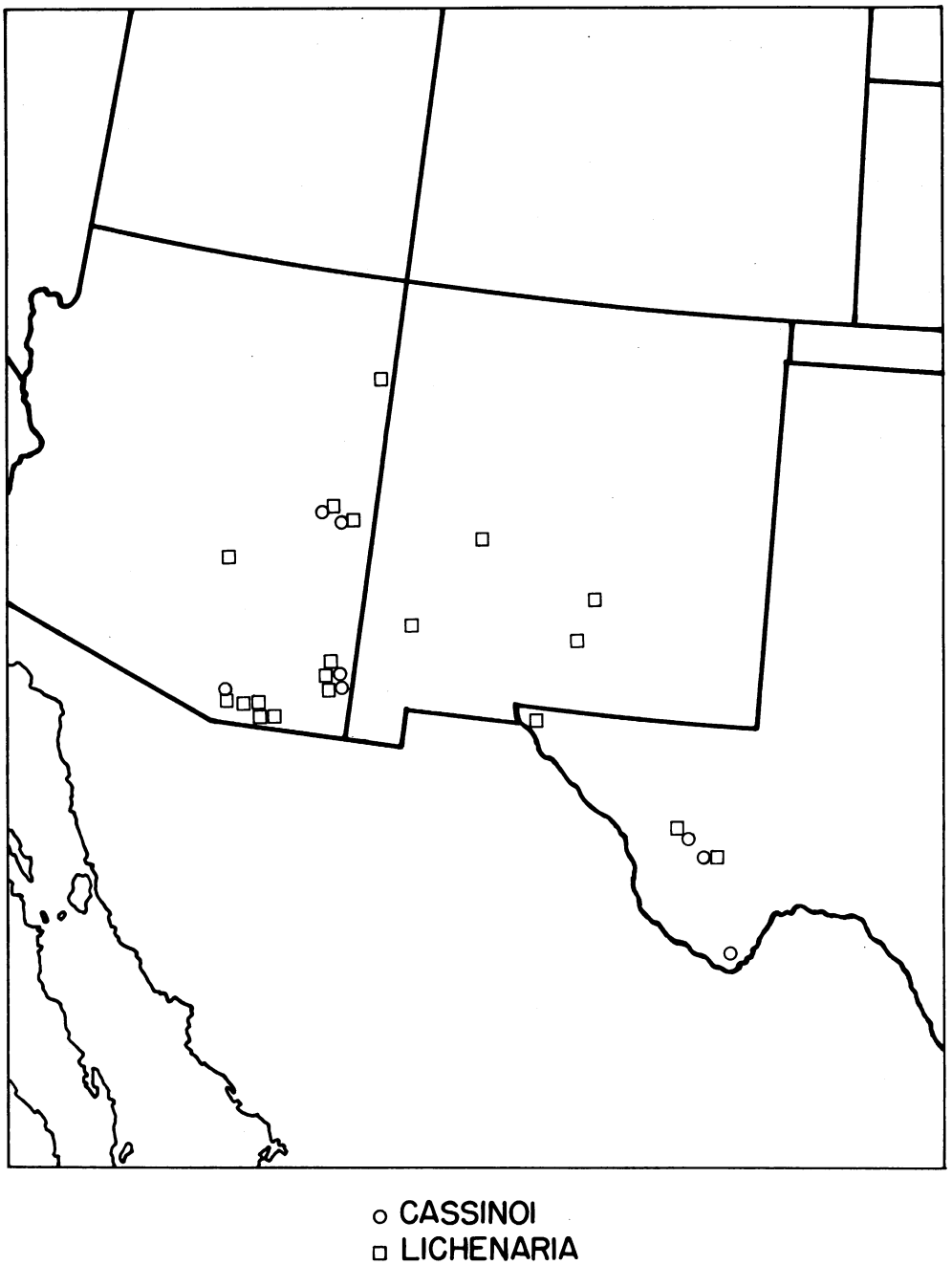


FIG. 54. The distribution of *Mericisca* (*Parapheromia*) *cassinoi* (McDunnough) and *M.* (*P.*) *ichenaria* (Pearsall) in the United States.

segment, 0.50 mm. in length. Thorax above gray to dark gray, patagia with transverse black band, posterior tufts small, gray; below white or grayish white, with gray scaling anteriorly; legs grayish white, having variable amount of dark gray scaling, fore- and mid-tarsi grayish black, with ends of segments pale. Abdomen above grayish or grayish brown, with

scattered brown scales, posterior ends of segments narrowly pale gray; below grayish white.

VENATION: Forewings with 11 veins; most specimens without areole, others with veins R_{1+2} and R_3 adjacent or shortly united.

UPPER SURFACE OF WINGS: Forewings grayish brown to pale pinkish brown, with numerous grayish black and black scales covering most of wing, with exception of quadrate costal patch, terminal area, and subterminal area along inner margin; cross lines black, mostly obscured, course as in *cassinoi* as far as can be told, with enlargements on veins in t. p. line; discal spot large, at edge of median shade, marking basal portion of pale quadrate costal patch; s. t. line showing mainly as dividing line between mostly dark subterminal area and pinkish brown terminal area; terminal line black, narrow, interrupted by veins, with large, black intravenular spots; fringe concolorous with wing, tending to be paler opposite vein endings. Hind wings concolorous with forewings, but with fewer grayish black and black scales basally; pattern as in *cassinoi* but with extradiscal line situated slightly more basad, swollen on veins, and more curved; s. t. line indicated mainly by grayish black scaling along inner side; terminal line less strongly represented than on forewings; fringe concolorous with wing.

UNDER SURFACE OF WINGS: Grayish white; forewings with variable amount of grayish black scaling, with some buff scales along costa and veins; cross lines and discal dots usually represented on all wings.

LENGTH OF FOREWINGS: 12 to 16 mm.

FEMALE: Similar to male, but with both upper and under surfaces of wings more heavily suffused with brownish black and black scales, tending to obscure almost all maculation; s. t. line grayish white, partially represented on upper surface of lower half of wings in some specimens.

LENGTH OF FOREWING: 14 to 17 mm.

MALE GENITALIA: Similar to those of *cassinoi*, differing mainly as follows: uncus with basal portion of posterior extension slightly swollen laterally; valves with sclerotized valvular process having inner face heavily and evenly covered with spines, latter short and thick distally, becoming more elongate and more slender posteromedially.

FEMALE GENITALIA: Similar to those of *cassinoi*, differing mainly as follows: sterigma with lateral areas more smoothly sclerotized, having definite anterior ridge, with shallowly V-shaped anterior margin to ostial area; broad, lightly sclerotized area anteriad of ostium about 2.5 times wider than ostial area; corpus bursae tending to be slightly shorter, 3.2 to 3.7 mm. in length. Apophyses posteriores 2.2 to 2.5 mm. in length.

TYPES: Pearsall described *lichenaria* from one male and one female; both specimens are in the collection of the National Museum of Natural History. The lectotype is hereby designated as the male, USNM 34258; its genitalia are mounted on slide HWC 211.

TYPE LOCALITY: Palmerlee, Huachuca Mountains, Cochise County, Arizona.

DISTRIBUTION: Eastern and southeastern Arizona, southern and central New Mexico, and western Texas (fig. 54). One specimen has been examined from northwestern Chihuahua, where it was taken at an altitude of 7400 feet.

TIME OF FLIGHT: From April (one record from southeastern Arizona) into September, with most records being July and August.

REMARKS: Four hundred four specimens (361 males, 43 females) and 26 genitalic dissections (19 males, seven females) have been studied, including the lectotype and its genitalia.

Mericisca (Parapheromia) ficta, new species

Figures, 33, 34, 43, 49, 55

DIAGNOSIS: This species can be separated from all the preceding ones by the course of the t. p. line on the upper surface of the forewings. In the present species this prominent line is outwardly angled opposite the cell, then goes with a slight concave bend to the inner margin. In addition, when compared with *lichenaria*, *ficta* is paler, has more contrasting maculation, and 12 veins in the forewings.

MALE: Head, vertex gray; front slightly raised, with broad, low, vertical median ridge, grayish black, tending to become grayish ventrally; palpi with first segment moderately long scaled below, grayish buff, second and third segments gray with variable number of grayish black scales; antennae of about 50 or 51 segments, with terminal nine simple, longest pectinations slightly more than two times as long as basal segment, 0.39 mm. in length. Thorax above gray, with variable number of grayish black scales, outer portion of collar grayish

black, posterior tufts gray; below pale grayish white, having some grayish brown scaling anteriorly; legs pale grayish white, with variable amount of brown and grayish brown scaling with tarsi having ends of segments paler. Abdomen above brown or brownish gray basally, becoming dark gray posteriorly, with first segment having narrow anterior overlaying band of black scales; below grayish white.

VENATION: Forewings with 12 veins, R_{1+2} stalked; without areole, although R_2 and R_3 may become adjacent for short distance.

UPPER SURFACE OF WINGS: Forewings grayish buff or grayish brown, with grayish black scaling, particularly as band distad of t. p. line and in upper portion of outer area; cross lines black, prominent; t. a. line as in *elpidata*, having more or less prominent basal grayish black shade band; median area tending to be slightly paler than rest of wing; median shade line nebulous, straight or slightly bowed, approaching t. p. line in lower portion of wing; discal dash elongate, marking inner portion of more or less quadrate, buff, gray or faintly grayish brown costal patch; t. p. line arising on costa seven-tenths to three-fourths of distance from base, basally V-shaped opposite cell, paralleling outer margin for short distance, then angled basad, varying from almost straight to concave, meeting inner margin at middle; subterminal area with prominent, somewhat diffuse grayish black shade band distad of t. p. line, with area of variable size and color, gray or grayish white, along inner margin; s. t. line absent or obsolescent; terminal area with dark scaling opposite outward bend in t. p. line, with pale area in some specimens in middle of wing; terminal line black, complete or reduced at vein endings, enlarged in cells; fringe concolorous with wings. Hind wings paler than forewings, gray, becoming more heavily suffused with grayish black and brown scales distally; intradiscal line either obsolescent or weakly represented and extending straight across wing; discal dot very small; extradiscal line black, complete, paralleling outer margin except for slight basal bend near anal margin; subterminal area dark gray or grayish brown, with incomplete, nebulous grayish white band down center; s. t. line grayish white, poorly defined; terminal area concolorous with subterminal area; terminal line and fringe similar to those of forewings.

UNDER SURFACE OF WINGS: Grayish white; forewings with variable amount of grayish brown scaling in apical area, with apex pale grayish buff; cross lines and discal dots represented on all wings.

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

FEMALE: Similar to male, with more grayish black scaling on upper surface of wings.

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

MALE GENITALIA: Similar to those of *cassinoi*, differing mainly as follows: more elongate, with tegumen being angulate (instead of rounded) and with longer, more attenuate saccus having longer anterior projection; valve with larger spinose valvular area extending almost to outer edge of valve and tending to have apical region more or less quadrate, and more elongate spinose saccular area; aedeagus longer, 1.8 to 2.0 mm. in length.

FEMALE GENITALIA: Sterigma with posterior margin rounded, lateral areas rugose and deeply concave, separated medially and anterolaterally by raised ridge, with posterior area broad, raised medially, anterior margin having sinuous raised ridge, with two U-shaped bends; ductus bursae 0.2 mm. in length, tapering anteriorly; corpus bursae 4.6 mm. in length, narrow, with ridges posteriorly, anterior end swollen; signum approximately 0.3 mm. wide by 0.3 mm. long. Apophyses posteriores 2.45 mm. in length.

TYPES: Holotype, male, McMillan Camp, 13 miles north of Silver City, Grant County, New Mexico, elevation 6800 feet, July 17, 1961 (F., P., and J. Rindge); allotype, female, Sunnyside, west side of Huachuca Mountains, Cochise County, Arizona, July 11, 1958 (L. M. Martin). The genitalia of the holotype are mounted on slide FHR 16237, and of the allotype on 16501. Paratypes: *New Mexico*: Cedar Creek Camp, 2 miles north of Ruidoso, Lincoln County, elevation 7000 feet, June 30, July 2, 4, 5, 1961 (F., P., and J. Rindge), five males; Pine Camp, 2 miles northeast of Cloudcroft, Otero County, elevation 8600 feet, July 1, 1964 (F., P., and M. Rindge), one male. *Arizona*: Carr Canyon, Huachuca Mountains, Cochise County, August, 1905 (H. Skinner), one male; Ramsey Canyon, Huachuca Mountains, Cochise County, June 26, 27, July 2, 1967, September 10, 1968 (R. F. Sternitzky; from the collection of the author), five males; Sunnyside, west side of Huachuca Mountains, Cochise County, various dates

between July 6 and 17, 1958 (L. M. Martin), 26 males and two females.

The holotype is in the collection of the American Museum of Natural History; the allotype is in the collection of the Los Angeles County Museum of Natural History. Paratypes are in the collections of these two institutions, and of C. W. Kirkwood.

DISTRIBUTION: Southeastern Arizona (Huachuca Mountains of Cochise County) and New Mexico (fig. 55). This species occurs from about 5000 feet elevation in the Huachuca Mountains up to 8600 feet in New Mexico.

TIME OF FLIGHT: From late June until the middle of September.

REMARKS: Forty-two specimens (39 males, three females) and seven genitalic dissections (five males, two females) have been studied.

It is interesting to note that both *cassinoi* and *ficta* occur in Cochise County, Arizona, with the former only being known from the Chiricahua Mountains and the latter from the Huachuca Mountains.

The specimens from New Mexico tend to be slightly larger and to have a more grayish upper surface of the wings than do the moths from the Huachuca Mountains.

ETYMOLOGY: The specific name is from the Latin *fictus*, false.

Mericisca (*Parapheromia*) *configurata* (Hulst), new combination

Figures 35, 36, 44, 52, 55

Selidosema configurata HULST, 1898, p. 195. RINDGE, 1955, p. 139.

Cleora configurata: DYAR, "1902" [1903], p. 326. SMITH, 1903, p. 77. BARNES AND MCDUNNOUGH, 1917, p. 117.

Parapheromia configurata: MCDUNNOUGH, 1920, p. 17, pl. 2, fig. 5 (male genitalia), pl. 7, fig. 19 (male), pl. 11, fig. 1 (venation); 1938, p. 163.

DIAGNOSIS: This species tends to be larger than *ficta*, and it is slightly more evenly and less contrastingly colored on the upper surface of the wings. The male antennae of *configurata* tend to have fewer segments than do those of *ficta*; the longest pectinations in the present species are about two and one-half times as long as the basal segment, or 0.45 mm. in length, compared with twice as long, or 0.39 mm. in length, for *ficta*.

MALE: Head similar to that of *ficta*; antennae of about 45 to 48 segments, terminal 10 simple, longest pectinations two and one-half times as long as basal segment, 0.45 mm. in length. Thorax and abdomen similar to those of *ficta*.

VENATION: Forewings with 12 veins, R_{1+2} stalked, varying from quite short to very long; without areole, although veins R_2 and R_3 may become adjacent for short distance.

UPPER SURFACE OF WINGS: Forewings varying from dark gray to brownish and having numerous gray and grayish black scales; cross lines black, with pattern as in *ficta*; discal spot present, in some specimens with row of pale scales medially; median area tending to be less contrastingly colored than in *ficta*. Hind wings similar to those of *ficta*, tending to be slightly grayer, having fewer brown scales.

UNDER SURFACE OF WINGS: Grayish white; similar to those of *ficta*, with forewings tending to have fewer grayish brown scales in apical area.

LENGTH OF FOREWING: 15 to 19 mm.

FEMALE: Similar to male, but with both upper and under surfaces of wings more heavily suffused with grayish black and black scales.

LENGTH OF FOREWING: 15 to 16 mm.

MALE GENITALIA: Very similar to those of *ficta*, differing mainly as follows: slightly larger; valves with apical portion of process of sacculus tending to be larger, averaging about 0.38 mm. long by 0.19 mm. wide (compared with 0.35 mm. long and 0.14 mm. wide in *ficta*), and somewhat tapered distally.

FEMALE GENITALIA: Similar to those of *ficta*, differing mainly as follows: sterigma with lateral areas smoothly sclerotized, weakly concave, having less prominent ridge delimiting lateral areas, with posterior area flatter, and anterior area not having raised, sinuous lip; signum slightly smaller, 0.3 mm. wide by 0.2 mm. in length. Apophyses posteriores 2.6 mm. in length.

TYPE: Hulst did not specify either the number or the sex of his type material; apparently he described *configurata* from a single specimen. This is a male, and it is in the collection of the American Museum of Natural History (Rindge, 1955, p. 139). There is a specimen in the collection of the National Museum of Natural History from Glenwood Springs, Colorado, August, 1892 (W. Barnes) that is also labeled "type"; this moth is *Stenoporpia vernata vernata* (Barnes and McDunnough).

TYPE LOCALITY: "Colorado; from Dr. Gillette."

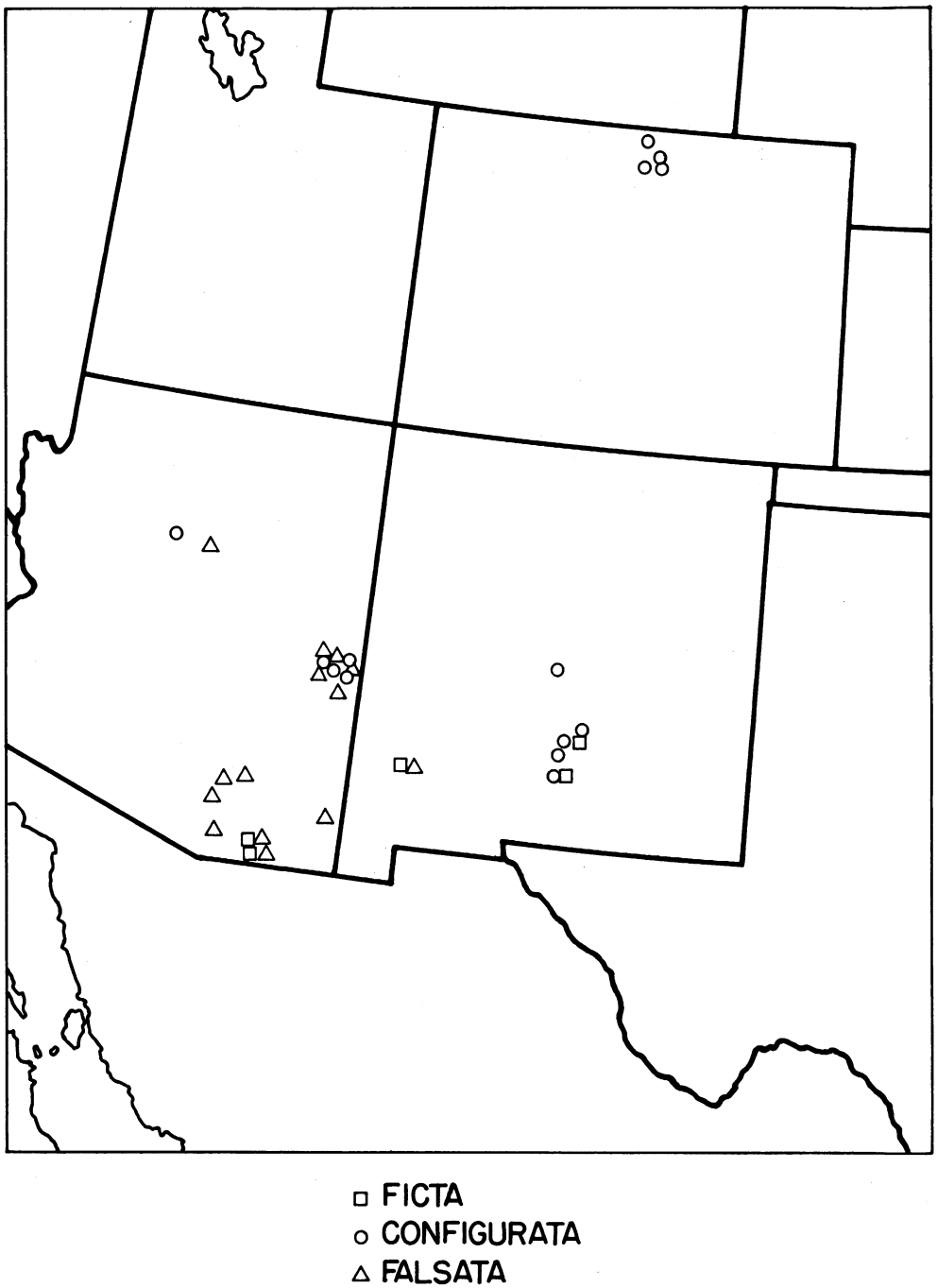


FIG. 55. The distribution of *Mericisca* (*Parapheromia*) *ficta*, new species, *M.* (*P.*) *configurata* (Hulst), and *M.* (*P.*) *falsata* (McDunnough) in the United States.

DISTRIBUTION: The states of Colorado (in the Front Range in Larimer County), New Mexico, and Arizona (fig. 55). In Chihuahua and Durango *configurata* occurs in the Sierra Madre Occidental. The known elevations range from 6500 to 10,000 feet.

TIME OF FLIGHT: Late June, July, and early August.

REMARKS: Thirty-one specimens (27 males, four females) and 10 genitalic dissections (nine males, one female) have been studied, including the type.

It is assumed that the three females that have been described above are *configurata*. They are the only specimens that have been seen from Chihuahua; it would have been helpful to have additional material that could be unquestionably associated with known males.

The Colorado specimens, at the northern end of the range, tend to be slightly larger and grayer than do the moths from the White Mountains of Arizona. The single male from Durango, at the southern end of the range, has more brown scaling on the upper surface of the wings than do the other examples.

Mericisca (*Parapheromia*) *falsata* (McDunnough), new status and new combination

Figures 37, 38, 45, 53, 55

Parapheromia configurata falsata McDUNNOUGH, 1920, p. 18, pl. 2, fig. 6 (male genitalia), pl. 7, fig. 9 (paratype male); 1938, p. 163.

DIAGNOSIS: This species is similar to *configurata*, but the upper surface of the wings is browner in color, the t. p. line is outwardly pointed on many of the veins, and the forewings have 11 veins.

MALE: Head similar to that of *configurata* but having front more raised and having central swelling, and with vertex and front tending to be slightly browner; antennae of about 50 segments, with terminal 10 simple, longest pectinations two and two-thirds times as long as basal segment, 0.52 mm. in length. Thorax and abdomen similar to those of *configurata* but with mixture of more contrastingly colored scales; abdomen above with narrow dark bands on posterior portion of anterior segments, and more broadly on anterior portion of last segment.

VENATION: Forewings with 11 veins; with or without areole.

UPPER SURFACE OF WINGS: Forewings with mixture of gray, grayish brown, grayish black, and black scales, producing a somewhat variegated brownish color; cross lines black, with pattern as in *configurata*, except t. p. line tending to be less acutely angled opposite cell and to be outwardly pointed on veins; discal spot large, center tending to be paler; quadrate costal patch, between discal spot and t. p. line, grayish white to gray, usually prominent and contrasting in color with remainder of wing; subterminal and terminal areas browner than in *configurata*. Hind wings similar to those of *configurata* but tending to have more brown scaling; extradiscal line more S-shaped.

UNDER SURFACE OF WINGS: Grayish buff; with more dull grayish black scaling, and more pattern represented on all wings, than in *configurata*.

LENGTH OF FOREWING: 16 to 18 mm.

FEMALE: Similar to male, but upper surface evenly and heavily covered with grayish black and black scales, mostly obscuring maculation; some specimens with brown area from t. p. line to tornus along inner margin. Under surface also with more dark scaling than in male.

LENGTH OF FOREWING: 15 to 17 mm.

MALE GENITALIA: Very similar to those of *configurata*, differing mainly as follows: slightly smaller; valves with apical setose area smaller, with sclerotized valvular area shorter, with more spines evenly distributed over inner face, and apex of saccular area much shorter and wider, triangular in outline; aedeagus 1.7 to 1.8 mm. in length.

FEMALE GENITALIA: Similar to those of *configurata*, differing mainly as follows: sterigma with smaller, flatter lateral areas, with lower ridges, having broader posterior area, and wider anterior portion, set off laterally by rounded ridges (in *configurata* they are acutely pointed). Apophyses posteriores 2.9 mm. in length.

TYPE: The holotype, male, is in the collection of the National Museum of Natural History.

TYPE LOCALITY: Palmerlee, Huachuca Mountains, Cochise County, Arizona.

DISTRIBUTION: Arizona and southwestern New Mexico (fig. 55). The species is also known from the Sierra Madre Occidental in the State of Chihuahua. This species apparently flies at elevations from about 5000 up to 8500 feet.

TIME OF FLIGHT: June, July, and early August.

REMARKS: Seventy-four specimens (52 males, 22 females) and 11 genitalic dissections (eight

males, three females) have been studied, including the type.

The majority of the specimens examined were taken in the White Mountains of eastern Arizona. Both *configurata* and *falsata* fly together in this area, the latter being taken in larger numbers than the former.

SUBGENUS *MERISMA* McDUNNOUGH, NEW STATUS

Merisma McDUNNOUGH, 1920, p. 18; 1938, p. 163.

DIAGNOSIS: The antennae of the males have their longest pectinations 0.1 to 0.4 mm. in length; the female antennae are simple or weakly serrate. The male genitalia have the inner surface of the valves either unornamented or with a small setose costal patch; a well-sclerotized, attenuate gnathos is present. The female genitalia have the sterigma represented by a sclerotized, rounded median area; the corpus bursae is twisted medially.

ADULTS: Head with front slightly raised above level of eyes, weakly punctate; antennae of male with from about 58 to 63 segments, terminal 12 to 22 simple, with longest pectinations varying from two-thirds to about two and one-half times as long as basal segments, and being from 0.1 to 0.4 mm. in length; antennae of female either simple or weakly serrate. Thorax with foreleg not having spinose projection; hind leg of male with hair pencil and groove. Abdomen with row of setae on ventral surface of third segment. Forewings with either 11 or 12 veins, with or without areole.

MACULATION: Of two types: one with prominent, complete cross lines on upper surface of forewings, having distinct pattern, and hind wings paler with reduced maculation; the second with reduced cross lines and even, overall pattern on both fore and hind wings. The first is associated with very short antennal pectinations in the male, whereas the second group has noticeably longer pectinations.

MALE GENITALIA: Uncus elongate, sides more or less concave, apex rounded; socius absent; gnathos heavily sclerotized, sides of even width, with long, attenuate median enlargement; valves with apical setose area, inner face with or without medial protuberance from costa, and weakly sclerotized, scarcely differentiated sacculus; anellus with posterior extension enlarged distally; aedeagus with vesica having either single short spine or one longer spine, paralleled by longer, very slender, membranous sac, and slightly anterior, paired, lateral, spinose areas.

FEMALE GENITALIA: Sterigma with round or elliptical sclerotized median area; ductus bursae sclerotized, short; ductus seminalis arising posteroventrally as small sac, with tube leading off therefrom; corpus bursae with posterior portion smoothly sclerotized, twisted medially, and enlarged anteriorly; signum relatively large, with numerous rays. Apophyses posteriores 2.2 to 5.8 mm. in length.

EARLY STAGES: Unknown.

FOOD PLANTS: Unknown.

TYPE SPECIES: *Alcis spododea* Hulst; by original designation.

DISTRIBUTION: From Wyoming and the southern Rocky Mountain states and western Texas in the United States, south to the State of Puebla, Mexico.

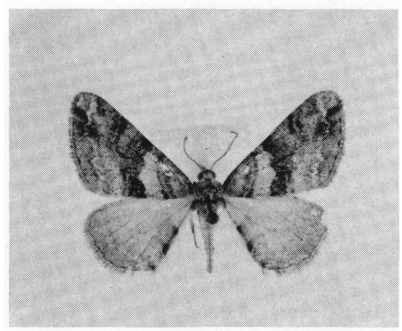
REMARKS: Once again the two different types of maculation are present, being similar to those found in *Mericisca* and *Parapheromia*.

Seven species are included in this subgenus. Three (*spododea*, *cryptapheles*, and *clandestina*) have prominent, complete cross lines on the upper surface of the forewings, and the hind wings with greatly reduced maculation. Four species (*ceraea*, *cretafunda*, *localis*, and *summa*) have reduced cross lines and an even, overall pattern on the upper surface of all wings.

KEY TO SPECIES

BASED ON MACULATION AND DISTRIBUTION

1. Hind wings with upper surface white or pale gray, having little or no maculation, contrasting in color with forewings; males with very short antennal pectinations, less than 0.2 mm. in length 2
   Hind wings with upper surface heavily and evenly mottled, concolorous with forewings; males with longer antennal pectinations, 0.3 to 0.4 mm. in length. 4
2(1). Forewings with t. p. line gently curved . . . . . *spododea*
   Forewings with t. p. line outwardly angled below costa 3
3(2). Forewings with apex pointed, with maculation usually clearly defined; palpi rising to middle of eye . . . . . *cryptapheles*
   Forewings with apex more rounded, and rather indistinct maculation; palpi rising to top of eye . . . . . *clandestina*
4(1). Upper surface of wings gray 5
   Upper surface of wings brown. 6
5(4). Upper surface of wings pale gray to grayish



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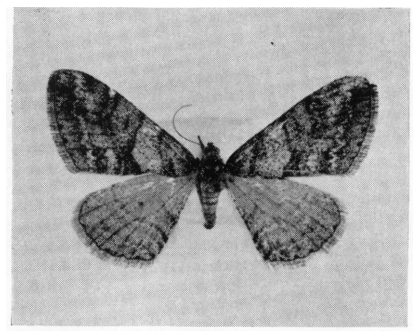

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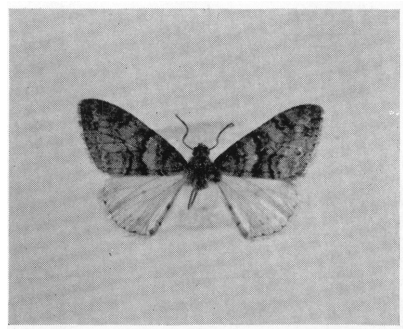

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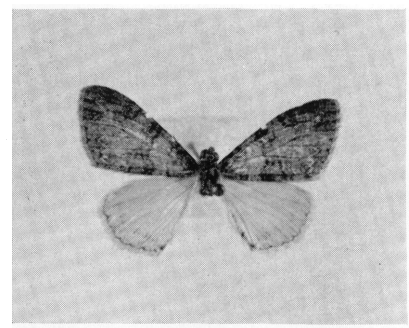


FIGS. 56–59. Adults of *Mericisca* (*Merisma*). 56, 57. *M.* (*M.*) *spododea* (Hulst). 56. Male, Estes Park, Colorado (Wiest; AMNH). 57. Female, Estes Park, Colorado, July 25, 1968 (A. and M. E. Blanchard; AMNH). 58. *M.* (*M.*) *cryptapheles* (Dyar), male, Tehuacan, Puebla, September, 1937 (C. C. Hoffmann; AMNH). 59. *M.* (*M.*) *clandestina*, new species, holotype male, Tehuacan, Puebla, September 20, 1937 (C. C. Hoffmann; AMNH). All figures × 1.3.

white; Durango and Veracruz . . . . . *cretafunda*

Upper surface of wings darker gray; Arizona . . . . . *ceraea*

6(4). Upper surface of wings with t. p. and extradiscal lines tending to be strongly dentate; in State of Mexico . . . . . *localis*

Upper surface of wings with t. p. and extradiscal lines tending to be thickened and outwardly projecting on veins; higher elevations in Hidalgo . . . . . *summa*

BASED ON MALE GENITALIA

1. Vesica with small spine only 2

Vesica with terminal spine and pair of lateral, apically dentate sclerotized areas 4

2(1). Valve with setose costal patch medially . . . . . *clandestina*

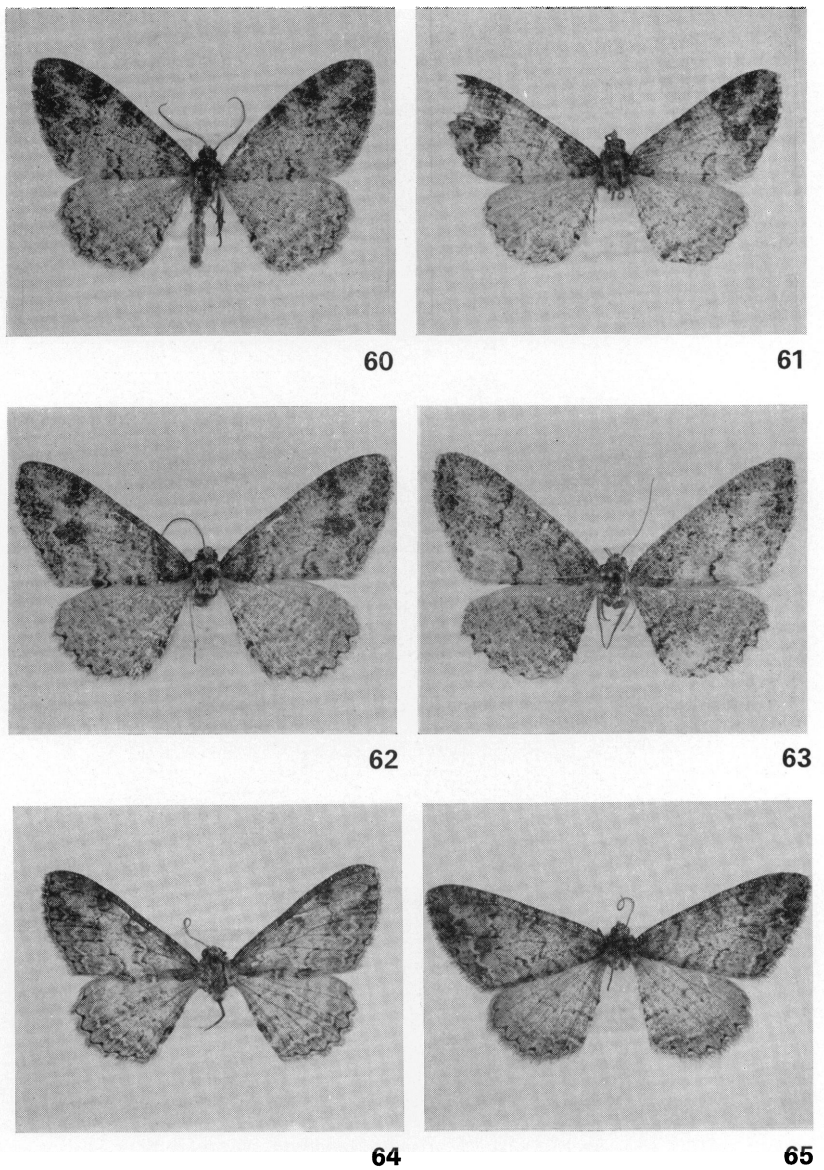
Valve simple, without setose costal patch . 3

3(2). Gnathos much widened laterally, with median portion long and slender . . *spododea*

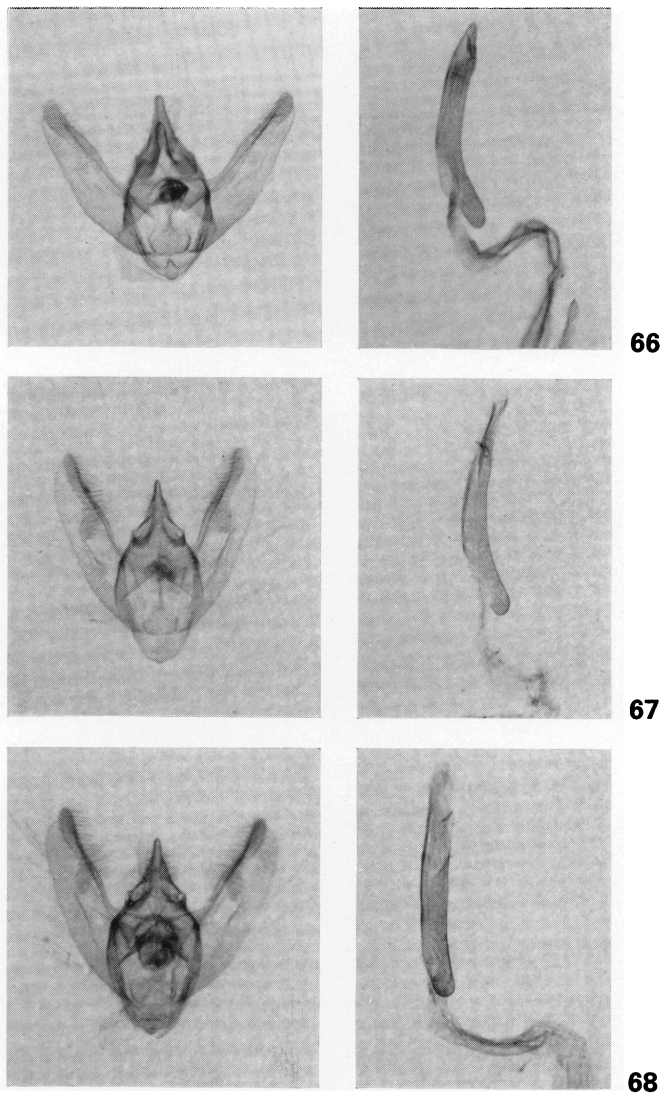
Gnathos only slightly wider laterally, with median portion broadly triangular . . . . . *cryptapheles*

4(1). Anellus with elongate posterior portion gradually increasing in width terminally . . 5

Anellus with elongate posterior portion



FIGS. 60–65. Adults of *Mericisca* (*Merisma*). 60. *M.* (*M.*) *ceraea* (Rindge), paratype male, Pine Crest, Arizona, June 29, 1959 (W. Rees; AMNH). 61–63. *M.* (*M.*) *cretafunda* (Dyar). 61. Holotype male, Misantla, Mexico, June, 1910 (R. Muller; USNM). 62. Male, 10 miles west of El Salto, Durango, June 18, 1964 (J. E. H. Martin; CNC). 63. Female, same data, July 8, 1964 (W. C. McGuffin; CNC). 64. *M.* (*M.*) *localis*, new species, holotype male, Zacualpan, Mexico, July, 1914 (C. C. Hoffmann; AMNH). 65. *M.* (*M.*) *summa*, new species, holotype male, Guerrero Mill, Hidalgo (Mann and Skewes; AMNH). All figures × 1.3.



FIGS. 66–68. Male genitalia of *Mericisca* (*Merisma*). 66. *M.* (*M.*) *spododea* (Hulst), Basin, Big Bend National Park, Texas, September 4, 1964 (A. and M. E. Blanchard; AMNH). 67. *M.* (*M.*) *cryptapheles* (Dyar), Tehuacan, Puebla, September 13, 1925 (C. C. Hoffmann; AMNH). 68. *M.* (*M.*) *clandestina*, new species, holotype, Tehuacan, Puebla, September 20, 1937 (C. C. Hoffmann; AMNH).

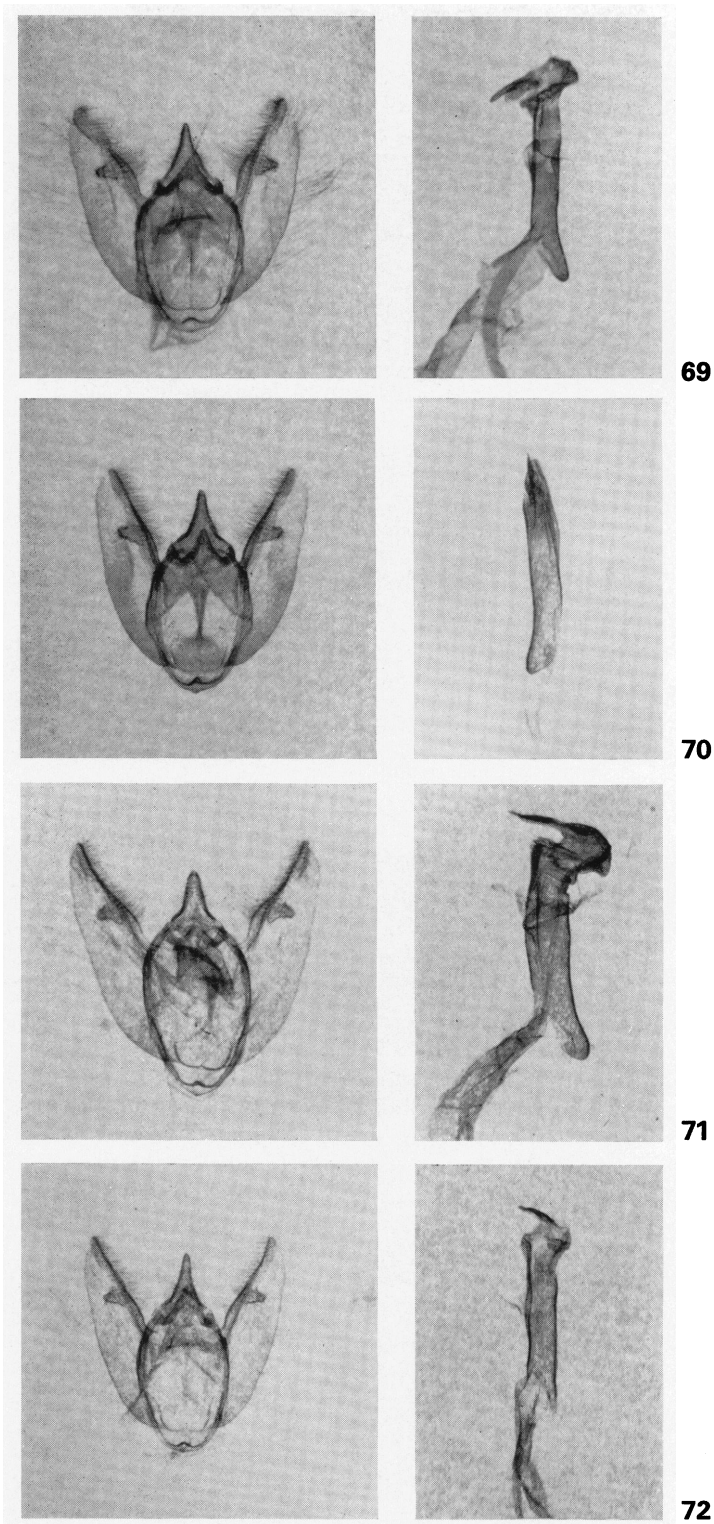
abruptly widened terminally, T-shaped. . . . . *localis*

5(4). Valves tapering to slender apex . . . *summa*
Valves broader, with wedge-shaped apex . 6

6(5). Uncus with lateral margins evenly curved . . . . . *ceraea*
Uncus with noticeable angle between basal portion and posterior part . . *cretafunda*

BASED ON FEMALE GENITALIA[1]

1. Area between sclerotized ductus bursae and sclerotized posterior end of corpus bursae membranous, projecting laterally on both sides . . . . . *spododea*
Without membranous area between ductus bursae and corpus bursae 2



FIGS. 69–72. Male genitalia of *Mericisca* (*Merisma*). 69. *M.* (*M.*) *ceraea* (Rindge), Ramsey Canyon, Arizona, July 11, 1967 (R. F. Sternitzky; AMNH). 70. *M.* (*M.*) *cretafunda* (Dyar), holotype, Misantla, Veracruz, June, 1910 (R. Muller; USNM). 71. *M.* (*M.*) *localis*, new species, holotype, Zacualpan, Mexico, July, 1914 (C. C. Hoffmann; AMNH). 72. *M.* (*M.*) *summa*, new species, holotype, Guerrero Mill, Hidalgo (Mann and Skewes; AMNH).

2(1). Corpus bursae with tubular portion posteriad of loop sclerotized for almost entire length 3
Corpus bursae with tubular portion posteriad of loop sclerotized for distal half only . . . . . *cryptapheles*

3(2). Corpus bursae with tubular portion posteriad of loop about 1.25 mm. in length . . . 4
Corpus bursae with tubular portion posteriad of loop about 1.80 mm. in length . . *localis*

4(3). Sterigma with sclerotized area widest anteriorly and having rounded corners; apophyses posteriores 2.6 to 2.8 mm. in length . . . . . *ceraea*
Sterigma with sclerotized area widest just posteriad of middle and having angulate corners; apophyses posteriores 2.3 mm. in length . . . . . *cretafunda*

Mericisca (*Merisma*) *spododea* (Hulst), new combination

Figures 56, 57, 66, 74, 75, 80

Alcis spododea HULST, 1896, p. 345. DYAR, "1902" [1903], p. 321; 1903, p. 226. SMITH, 1903, p. 76.
Alcis spododia [*sic*]: RINDGE, 1955, p. 154.
Cleora spododea: BARNES AND MCDUNNOUGH, 1917, p. 118.
Merisma spododea: MCDUNNOUGH, 1920, p. 18, pl. 2, fig. 7 (male genitalia), pl. 7, fig. 5 (male), pl. 9, fig. 2 (male antenna), p. 11, fig. 3 (venation of forewing); 1938, p. 163.

DIAGNOSIS: This species can be recognized by the upper surface of the forewings being gray, and having a broad, straight black median shade line about 1 mm. in width; the hind wings are grayish white with greatly reduced maculation.

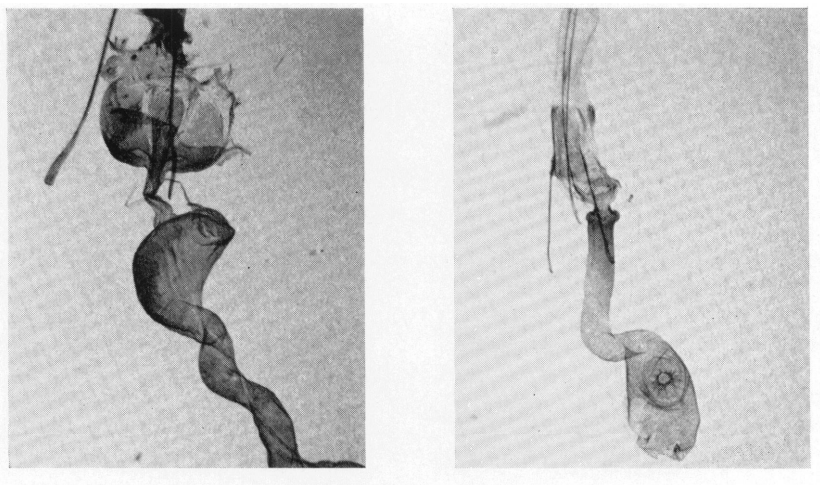
MALE: Head, vertex having mixture of pale and dark gray scales, and with black band between bases of antennae; front broadly black across central region, gray dorsally and ventrally; palpi with first segment long scaled below, white, second segment grayish black, and third segment with mixed grayish black and white scales; antennae of about 58 segments, with terminal 13 simple, longest pectinations three-fourths as long as basal segment, 0.15 mm. in length. Thorax above with mixture of pale gray, grayish black, and grayish brown scales, collar and patagia having dark band of varying width in most specimens, and with small posterior tufts concolorous with remainder of thorax; below white or pale grayish white; legs pale grayish white, having variable number of grayish black and brownish black scales, fore- and mid-tarsi dark, with ends of segments pale. Abdomen above pale gray, having variable number of grayish brown and brownish black scales, with posterior margins of segments black or brownish black, in many cases decreasing in strength posteriorly; below pale grayish white.

VENATION: Forewings with 11 veins, R_{1+2} short stalked or arising at common point, then R_1 splitting off and uniting with Sc; areole present in most specimens, absent in some.

UPPER SURFACE OF WINGS: Forewings pale gray, with variable number of dark gray, grayish brown, and black scales, producing a more or less grayish color, with exception of basal part of pale gray median area; cross lines black, complete, with very prominent and wide median line; t. a. line arising on costa one-fourth of distance from base, crossing costa at right angle then going straight to inner margin at three-tenths distance from base, and having broad grayish black shade band basally; median line very broad, about 1.0 mm. in width, arising on costa about middle, proceeding straight or with gentle curve to inner margin; discal dot either absent or obsolescent; t. p. line arising on costa three-fourths of distance from base, weakly S-shaped, and having grayish black or grayish brown shade band distally; subterminal area with somewhat nebulous pale gray band medially, of varying thickness; s. t. line grayish white, complete in most specimens, outwardly bowed in cells; terminal area with grayish black scaling below apex; terminal line black, narrow, with intravenular spots; fringe concolorous with wing. Hind wings pale gray, with increasing number of dark gray scales distally; intradiscal line represented in lower portion of wing only; discal dot present in most specimens, small; extradiscal line complete but rather faintly represented, subparalleling outer margin; s. t. line variably represented, present in lower portion of wing only in most specimens; terminal line black, without intravenular spots; fringe concolorous with wing.

UNDER SURFACE OF WINGS: Whitish gray; forewings with variable amount of gray scaling, reflecting pattern of upper surface; hind wings immaculate or with incomplete trace of cross lines; terminal line varying from dark gray on

[1]The females of *clandestina* and *summa* are unknown.



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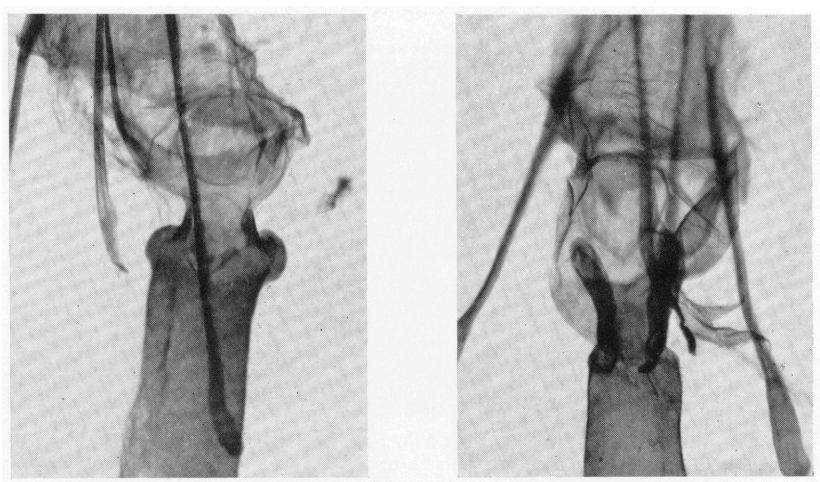

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FIGS. 73–76. Female genitalia of *Mericisca*, showing sterigma, ductus bursae, and adjacent areas. 73. *Mericisca* (*Puebla*) *aztecaria* (Schaus), Puebla, Puebla, June 13, 1918 (C. C. Hoffmann; AMNH). 74, 75. *Mericisca* (*Merisma*) *spododea* (Hulst), Estes Park, Colorado, July 27, 1968 (A. and M. E. Blanchard; AMNH). 76. *Mericisca* (*Merisma*) *cryptapheles* (Dyar), Tehuacan, Puebla, September 14, 1937 (C. C. Hoffmann; AMNH).

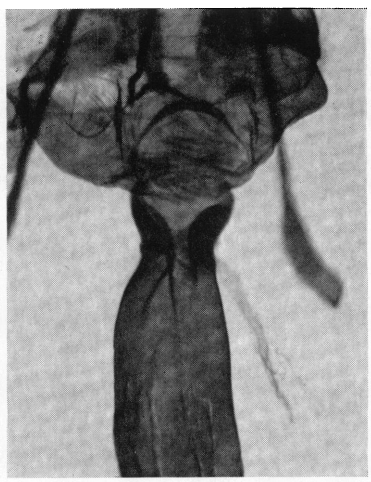
all wings to being absent; fringes concolorous with wings.

LENGTH OF FOREWING: 13 to 17 mm.

FEMALE: Similar to male, tending to have slightly more dark gray and grayish black scaling on both upper and under surfaces of wings, thus tending somewhat to obscure maculation; antennae simple.

LENGTH OF FOREWING: 13 to 16 mm.

MALE GENITALIA: Uncus longer than width



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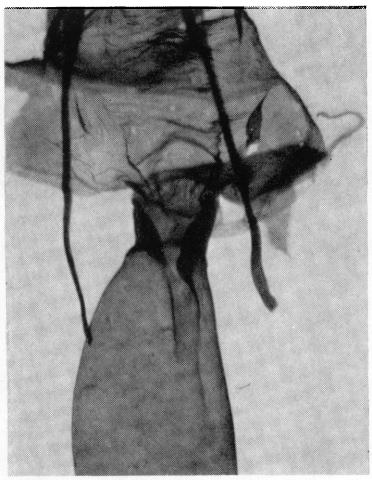

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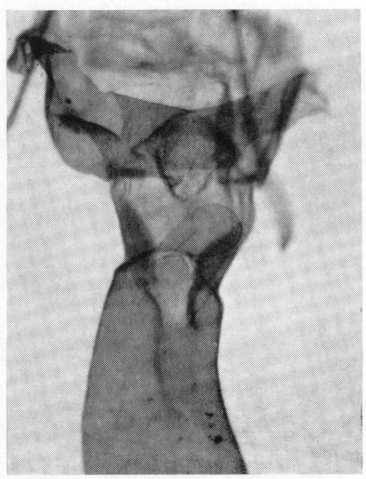

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FIGS. 77–79. Female genitalia of *Mericisca* (*Merisma*), showing sterigma, ductus bursae, and adjacent areas. 77. *M.* (*M.*) *ceraea* (Rindge), Carr Canyon, Arizona, August 2, 1965 (R. F. Sternitzky; AMNH). 78. *M.* (*M.*) *cretafunda* (Dyar), 10 miles west of El Salto, Durango, July 8, 1964 (W. C. McGuffin; CNC). 79. *M.* (*M.*) *localis*, new species, allotype, Zacualpan, Mexico, July, 1914 (C. C. Hoffmann; AMNH).

of its base; gnathos with wide lateral margins, and distance from anterior margin of sides to apex subequal to length of uncus; valve with weakly sclerotized areas on inner face, scarcely differentiated, with weakly setose area near middle of costa; anellus slightly wider than long, with weak median anterior incision, and posterior extension longer than basal portion; aedeagus 1.6 mm. in length, slightly curved, and with pointed, weakly sclerotized posterior end; vesica armed with single short spine.

FEMALE GENITALIA: Sterigma with elliptical or rounded sclerotized median area, 0.3 to 0.4 mm. in width; ductus bursae with sclerotized area about twice as wide as long, with swollen, bulbous membranous area between ductus bursae and corpus bursae; ductus seminalis arising ventrally from bulbous area; corpus

bursae with posterior portion tubelike, of equal width, caudal half sclerotized, then median section making sharp turn to right then another turn anteriorly, forming swollen portion of corpus bursae; signum stellate, 0.5 mm. in width. Apophyses posteriores 4.4 to 5.8 mm. in length.

TYPES: Hulst did not specify either the number or sex of the specimens he had when describing *spododea*. There had to be at least two, as two wing measurements were given; they were undoubtedly males as he mentioned the very short and distinct pectinations of the antennae. The following specimens labeled "type" have been located: a male, without locality data, in the collection of the American Museum of Natural History (Rindge, 1955, p. 154); two females in the National Museum of Natural History labeled "Col.," one ex-Brooklyn Museum Collection, the other bearing their type No. 3896. As these last two are females it appears that they cannot be the original types; consequently I hereby designate the above-mentioned male as the lectotype.

TYPE LOCALITY: Colorado.

DISTRIBUTION: This species is widespread in Colorado and New Mexico. It extends to the north into Grand Teton National Park, Wyoming; it occurs in central and southeastern Utah, in Arizona, and in western Texas (fig. 80). In Mexico it is known from Chihuahua, Coahuila, and Durango. The moth has been captured at elevations from about 4300 feet up to 9000 feet. There are two specimens in the collection of the Los Angeles County Museum that are labeled "Mt. Lowe, Cal., July 8, 1923"; these are believed to bear incorrect data.

TIME OF FLIGHT: June, July, August, and September.

REMARKS: Six hundred ninety-nine specimens (507 males, 192 females) and 20 genitalic dissections (12 males, eight females) have been studied.

In general, the moths from Colorado, Utah, and the White Mountains of eastern Arizona tend to be slightly larger and to have a darker gray upper surface to the wings than specimens from the remainder of the range of the species.

Mericisca (*Merisma*) *cryptapheles* (Dyar), new combination

Figures 58, 67, 76

Phigalia cryptapheles DYAR, 1913, p. 314.

DIAGNOSIS: This species can be separated from *spododea* by the upper surface of the hind wings being white and almost without maculation; on the forewings, the median shade line is much narrower and more curved.

MALE: Head, vertex, front, and palpi similar to those of *spododea*, but tending to be more unicolorous dark gray; antennae of about 63 segments, with up to 22 terminal segments simple, longest pectinations two-thirds as long as basal segment, 0.10 mm. in length. Thorax above more unicolorous dark gray than that of *spododea*, and collar and patagia lacking dark cross bands; below white; fore- and mid-legs having numerous black and grayish black scales on tibia and tarsus, latter with ends of segments pale. Abdomen above similar to that of *spododea*, having fewer dark scales and without posterior banding on segments; below white.

VENATION: Similar to that of *spododea*.

UPPER SURFACE OF WINGS: Forewings relatively narrow and with pointed apex; varying in color from pale to dark gray, due to variable number of grayish black and black scales; cross lines black, varying from complete to having interrupted t. p. line; t. a. line geminate, with grayish black shade band tending to be of equal width and color as line itself, arising about one-fifth of distance from base, evenly curving across wing; median area with basal portion either concolorous with rest of wing, or paler gray; median line narrower than in *spododea*, varying from 0.2 to 0.6 mm. in width, with paler distal shade band, arising on costa about two-fifths of distance from base, curving across wing, with basal bends of varying strength on veins; discal dot absent; t. p. line arising on costa about three-fifths of distance from base, crossing costa, angled outward opposite cell, then noticeably concave to inner margin, with line becoming reduced or obsolescent in middle of wing in some specimens; subterminal area having incomplete shade line distad of t. p. line, grayish black, becoming brown above inner margin in some specimens; s. t. line grayish white, becoming obsolescent in middle of wing, narrow, outwardly bowed in cells; terminal area with two or three dark intravenular lines between s. t. and terminal lines in upper part of wing; terminal line weakly represented except for intravenular spots; fringe concolorous with wing, paler opposite vein endings. Hind wings shining white, with numerous white hairlike scales; without maculation except for a few

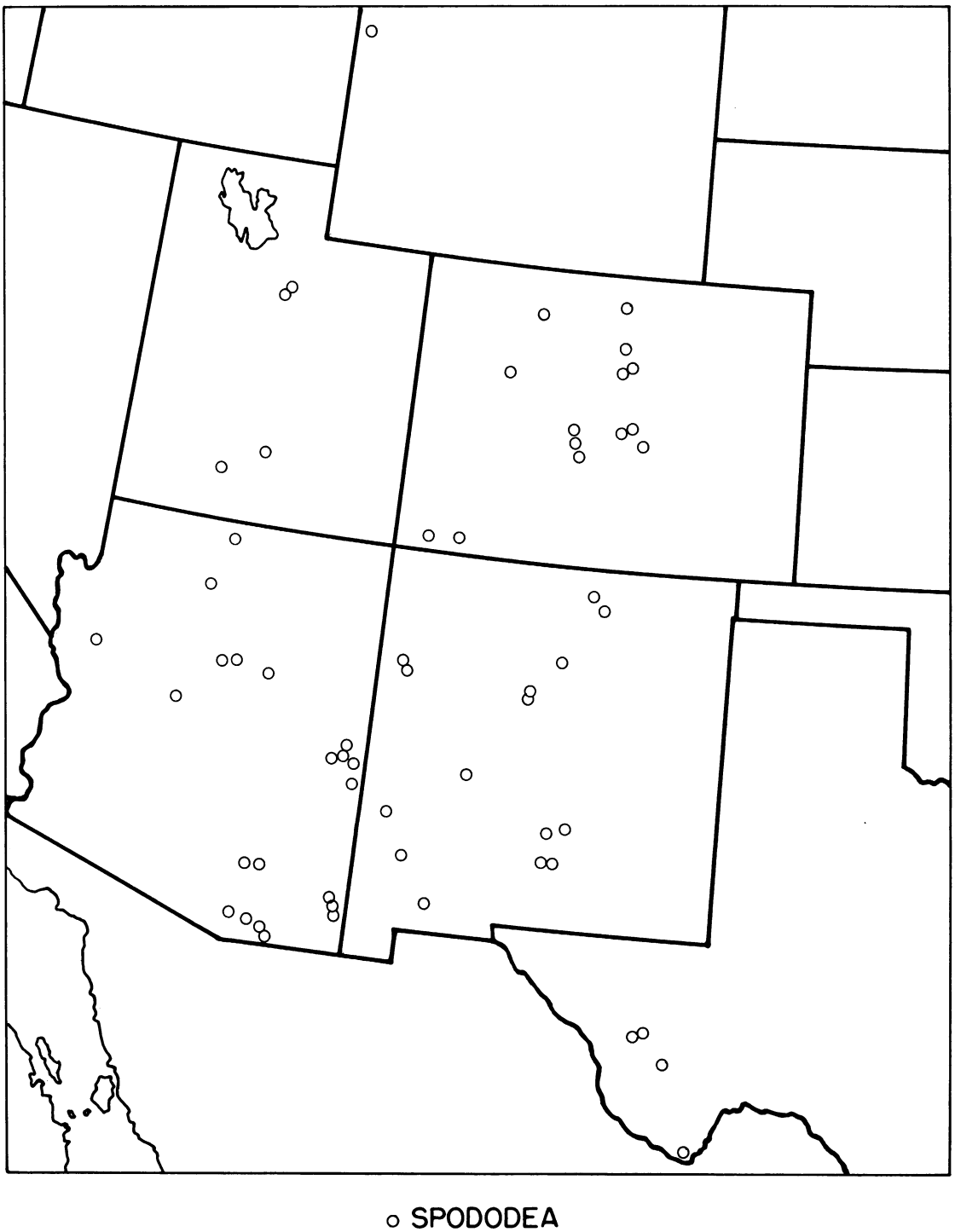


FIG. 80. The distribution of *Mericisca* (*Merisma*) *spododea* (Hulst) in the United States.

black scales along anal margin, and for some dark gray scales in terminal area; terminal line black; fringe white.

UNDER SURFACE OF WINGS: Forewings grayish white, having faint traces of maculation from upper surface visible; hind wings shiny white, without maculation; all wings with narrow, brownish black terminal line, and white fringes.

LENGTH OF FOREWING: 12 to 15 mm.

FEMALE: Similar to male, but with more dark gray scaling on upper surface of forewings, obscuring almost all maculation; hind wings with complete gray subterminal band; antennae simple.

LENGTH OF FOREWING: 15 mm.

MALE GENITALIA: Similar to those of *spododea*, differing mainly as follows: gnathos with more slender lateral margins, and with distance from anterior margin of sides to apex shorter than length of uncus; valve with larger setose area near middle of costa, and low, raised, longitudinal valvular ridge; aedeagus 1.6 to 1.9 mm. in length.

FEMALE GENITALIA: Similar to those of *spododea*, differing mainly as follows: sterigma with elliptical sclerotized median area, longer than wide, having pointed anterior end; ductus bursae longer than wide, lateral margins sclerotized, slightly tapering anteriorly and becoming narrower than posterior end of corpus bursae; latter with tubelike posterior portion shorter, swinging to right and curving ventrally into swollen portion of corpus bursae; signum stellate, 0.6 mm. in width. Apophyses posteriores 5.3 mm. in length.

TYPES: Dyar described *cryptapheles* from two male cotypes, USNM 14548. The lectotype is hereby designated as the specimen with Dyar's holographic type label.

TYPE LOCALITY: Zacualpan, Mexico, Mexico.

DISTRIBUTION: The Mexican states of Mexico and Puebla. The species has been captured at elevations of from about 5500 to 8000 feet.

TIME OF FLIGHT: May, September, and October.

REMARKS: Thirteen specimens (11 males, two females) and four genitalic dissections (three males, one female) have been studied.

The maculation of the upper surface of the forewings is rather variable. At one extreme the wings are a relatively pale gray with prominent maculation; at the other the wings are a much darker gray with a poorly defined pattern.

Mericisca (Merisma) clandestina, new species

Figures 59, 68

DIAGNOSIS: This species looks very similar to dark specimens of *cryptapheles* but may be distinguished from that species by the broader forewings having a more rounded apex, by the longer pectinations of the male antennae, by the longer palpi, and by the genitalia.

MALE: Head similar to that of *cryptapheles*, but with longer palpi, reaching almost to top of eye; antennae of about 59 segments, with terminal 12 segments simple, longest pectinations equal to length of basal segment, 0.18 mm. long. Thorax similar to that of *cryptapheles*.

VENATION: Similar to that of *spododea*.

UPPER SURFACE OF WINGS: Forewings broader than those of *cryptapheles*, with more rounded apical portion of wing; dark gray, with paler gray basal portion of median area; maculation similar to that of *cryptapheles*, with t. p. line tending to be less clearly represented, becoming mostly obsolescent, lacking distal shade band, and s. t. line absent from central portion of wing; terminal line obsolescent except for intravenular spots; fringe as in *cryptapheles*. Hind wings similar to those of *cryptapheles*.

UNDER SURFACE OF WINGS: Similar to that of *cryptapheles*.

LENGTH OF FOREWING: 15 mm. (holotype).

FEMALE: Unknown.

MALE GENITALIA: Similar to those of *cryptapheles*, differing mainly as follows: gnathos slightly shorter, broader, and having apex more rounded; valve with middle of costal margin more swollen, with well-defined, sclerotized setose area near middle of costa.

FEMALE GENITALIA: Unknown.

TYPE: Holotype, male, Tehuacan, Puebla, Mexico, elevation 5500 feet, September 20, 1937 (C. C. Hoffmann). The genitalia of the type are mounted on slide FHR 16243.

The unique type is in the collection of the American Museum of Natural History.

DISTRIBUTION: This species is known only from the State of Puebla.

TIME OF FLIGHT: September.

REMARKS: One specimen and one genitalic dissection have been studied.

ETYMOLOGY: The specific name is from the Latin *clandestinus*, hidden or concealed.

Mericisca (*Merisma*) *ceraea* (Rindge), new combination

Figures 60, 69, 77, 81

Merisma ceraea RINDGE, 1958, p. 11, figs. 5 (paratype male), 12, 13 (male genitalia), 23 (female genitalia).

DIAGNOSIS: This species can be separated from all of the preceding ones by its different type of maculation, as *ceraea* has the upper surface of the wings with reduced cross lines and an even, overall pattern on both the fore and hind wings. In addition, the males of the present species have noticeably longer antennal pectinations than do any of the preceding moths.

This species was recently named; therefore the description is not repeated. The male antennae have about 60 segments, with the terminal 16 simple; the pectinations are twice as long as the basal segments, being 0.38 mm. in length. The antennae of the female have fewer segments than do those of the male, and they are weakly serrate. There are 12 veins in the forewings, with R_{1+2} being short stalked, and R_1 then uniting with Sc for a distance, then becoming free. The areole may or may not be present; in most specimens it is represented.

The upper surface of the wings is pale gray, mottled and irrorate with grayish black scaling, the latter being particularly heavy in the apical region of the forewings. The cross lines are obsolescent, although the t. p. and s. t. lines may be variably represented. The maculation and color of the males and females are alike. The length of the forewings of the males varies from 11 to 20 mm., of the females from 17 to 20 mm.

The male genitalia can be separated from those of the preceding species by the nature of the armature of the vesica, as in the present species there is a long smooth spine, paralleled by a longer, very slender membranous sac, and a pair, one on each side, of lateral, spinose areas slightly anteriad of the first spine. The uncus is evenly tapering. The valves have the costa more swollen than in the preceding species, and there is a well-defined mid-costal spinose patch.

The female genitalia have the sclerotized area of the sterigma widest anteriorly, where it has rounded corners. The ductus bursae is wider than long, tapering anteriorly, and with sclerotized lateral margins. The corpus bursae is similar to that of *cryptapheles* but tends to be slightly wider and to have a weaker curved section medially. The apophyses posteriores are much shorter than those of the preceding species; in *ceraea*, they range from 2.6 to 2.8 mm. in length.

TYPES: The holotype, male, and allotype, female, are in the collection of the Los Angeles County Museum of Natural History.

TYPE LOCALITY: Pine Crest, Mt. Graham, Pinaleno Mountains, Graham County, Arizona, elevation 7300 feet.

DISTRIBUTION: Southeastern Arizona (fig. 81). The species has been taken in the Pinaleno Mountains in Graham County, and the Huachuca Mountains of Cochise County, at elevations of from about 5000 to 7300 feet.

TIME OF FLIGHT: February, April, and from June into September. Most specimens have been caught in July and August, with some late June and early September records. The species must be partially double brooded, as the moths also fly in early spring when conditions are favorable.

REMARKS: Forty-three specimens (33 males, 10 females) and eight genitalic dissections (six males, two females) have been studied.

Mericisca (*Merisma*) *cretafunda* (Dyar), new combination

FIGURES 61, 62, 63, 70, 78

Alcis cretafunda DYAR, 1912, p. 92.

DIAGNOSIS: This species is quite similar to *ceraea* but may be recognized by the paler gray color of the upper surface of the wings, the more contrastingly colored wings of the males but the females having almost no contrast, and by the longer pectinations of the male antennae. The two species can be recognized by a study of their genitalia. The preceding species occurs in Arizona, whereas the present one is known only from Mexico.

MALE: Head, thorax, and abdomen similar to those of *ceraea*, but with antennae of 58 or 59 segments, with terminal 14 or 15 simple, longest pectinations 2.3 to 2.5 times as long as basal segments, being 0.45 mm. in length.

UPPER SURFACE OF WINGS: Very similar to those of *ceraea*, tending to be slightly paler gray, with fewer scattered dark brown and black scales and strigations; forewing apparently with slightly stronger and browner shading in basal area, and again distad of t. p. line below costa and as large spot in middle of wing, these last

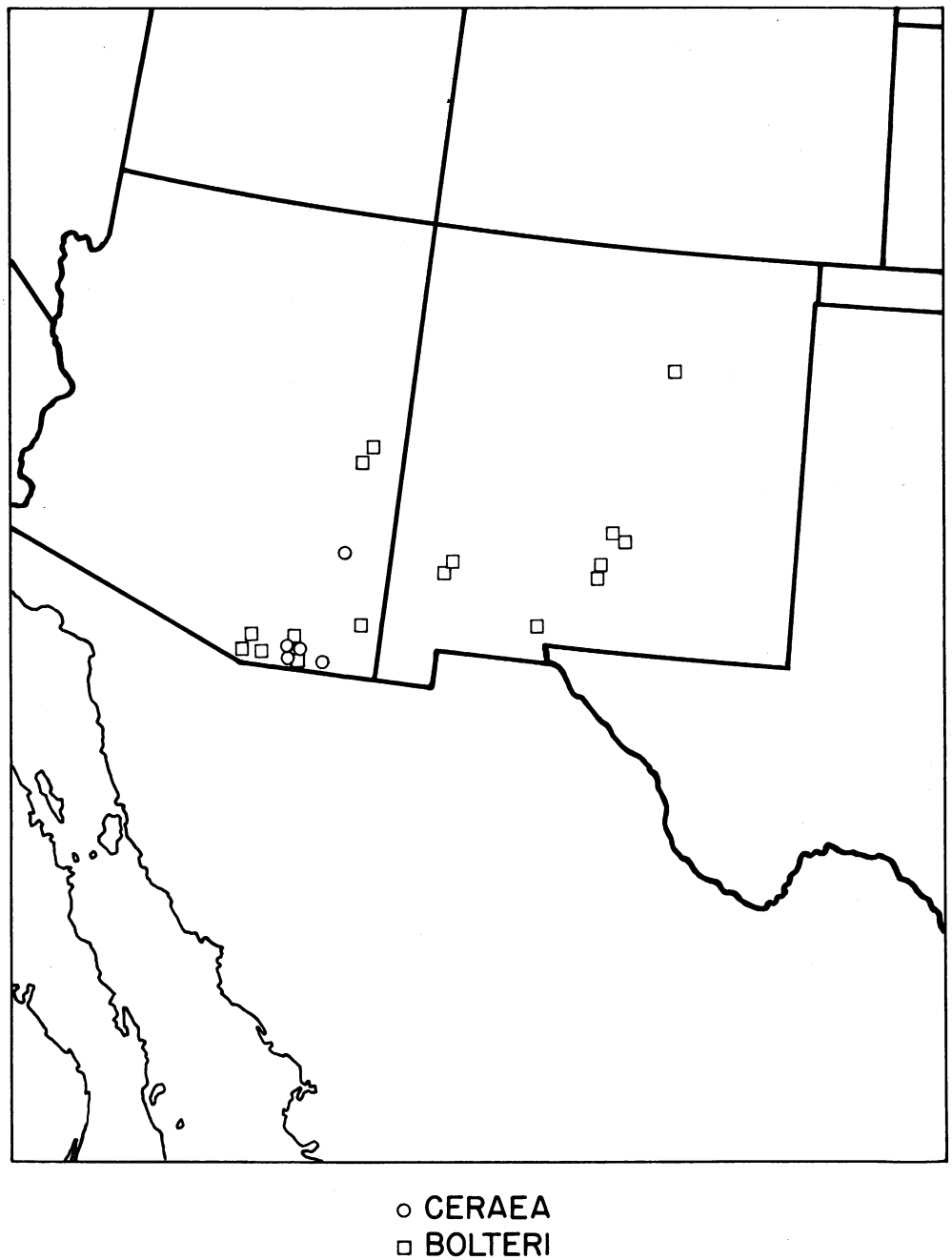


FIG. 81. The distribution of *Mericisca* (*Merisma*) *ceraea* (Rindge) and *Mericisca* (*Tracheops*) *bolteri* (Hulst) in the United States.

two tending to have more black and less brown scales than in *ceraea*, with t. p. line running through costal spot; hind wings with strigations and scaling mainly paler brown than that of *ceraea*, with extradiscal line tending to be more in center of wing and to meet costal margin nearer middle.

UNDER SURFACE OF WINGS: Similar to that of

ceraea but having less yellowish scaling.

LENGTH OF FOREWING: 17 to 20 mm.

FEMALE: Similar to male, but upper surface of wings without any contrasting dark scaling, thus appearing much paler and more evenly colored than *ceraea*. Under surface paler than that of *ceraea*.

LENGTH OF FOREWING: 20 mm.

MALE GENITALIA: Very similar to those of *ceraea*, differing mainly as follows: uncus with base having lateral areas narrower and wider (0.45 mm. broad; 0.37 mm. wide in *ceraea*), with posterior portion attenuate, having marked angle between both areas; gnathos tending to be slightly broader laterally, more curved posteriorly, with a slightly more attenuate median area; valve with mid-costal spinose patch tending to be narrower basally; vesica with slightly shorter and narrower terminal spine and smaller, less sclerotized pair of spinose areas.

FEMALE GENITALIA: Very similar to those of *ceraea*, differing mainly as follows: sterigma with sclerotized area widest just posteriad of middle, and having angulate corners; ductus bursae slightly narrower and less flaired posteriorly; corpus bursae with posterior sclerotized section slightly wider, being more swollen on left side; apophyses posteriores 2.3 mm. in length.

TYPE: The holotype, male, is USNM 14229, and the genitalia are mounted on slide DCF 1467.

TYPE LOCALITY: Misantla, Veracruz, Mexico.

DISTRIBUTION: The Mexican states of Veracruz and Durango. The type locality is at an elevation of approximately 1350 feet; the Durango location is at 9000 feet.

TIME OF FLIGHT: June and July.

REMARKS: Three specimens (two males, one female) and three genitalic dissections have been studied including the holotype and its genitalia.

The type, with the exception of the apical area of the left forewing, is in good condition, although it may be a bit faded in color from age. The fresh male from Durango (caught in 1964; the type was taken in 1910) is grayer and less contrastingly marked than is the type, thus looks more like *ceraea*. The antennae and male genitalia of the Veracruz and Durango specimens are very similar, and so they are believed to be conspecific, although very closely related to *ceraea* from Arizona.

Mericisca (Merisma) localis, new species

Figures 64, 71, 79

DIAGNOSIS: This species is similar to the two preceding species, but the upper surface of the wings has more clearly defined cross lines, the color brownish rather than the gray or grayish black as in *ceraea* and *cretafunda*.

MALE: Head, thorax, and abdomen similar to those of *ceraea*, but being basically brownish gray; antennae with about 59 segments, terminal 18 simple, longest pectinations one and one-half times as long as basal segment, being 0.32 mm. in length.

VENATION: Similar to that of *ceraea*.

UPPER SURFACE OF WINGS: Forewings pale gray, mottled and irrorate with brown, grayish brown, and blackish brown scales, especially in basal and outer portions of wing; cross lines blackish brown, complete; t. a. line arising on costa about one-fourth of distance from base, crossing costa at right angle, then angled and going with weak curve to meet inner margin one-fifth of distance from base, and having broad, grayish brown basal shade band; median line arising on costa about two-fifths of distance from base, having strong outward angles in discal and cubital cells being concave between, running down middle of median area, having dark, distal shade band; discal dot either absent or appearing as faint thickening of distal shade band; t. p. line arising on costa about two-thirds distance from base, angled inward to below vein R_5, then somewhat S-shaped to anal vein, meeting inner margin with basal slant, with line tending to be thickened and outwardly projecting on veins; subterminal area having incomplete, dark shade band to t. p. line, absent in center of wing, with grayish black patch in lower half of cell M_2 and in all of cell M_3; s. t. line grayish white, usually complete, outwardly curved in cells; terminal area with grayish black scaling in cells R_5, M_1, and M_2; terminal line brownish black, with small intravenular dots; fringe concolorous with wing, slightly paler opposite vein endings. Hind wings similar to forewings but more evenly colored; intradiscal line weakly represented, proceeding more or less straight across wing, and followed distally by more or less complete shade line; discal dot small; extradiscal line complete, dentate, outwardly pointed on veins, having quadrate brownish black patch on anal margin, and line

having very nebulous brown or grayish brown distal shade band; subterminal area with pale gray median band, varying from complete to obsolescent, becoming dark gray basad of complete, pale gray s. t. line; terminal line and fringe similar to those of forewing.

UNDER SURFACE OF WINGS: Pale grayish brown; forewings with dark gray and grayish brown scaling reflecting maculation of upper surface; hind wings more immaculate, varying from having no maculation to small discal dot and faint traces of cross lines.

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

FEMALE: Similar to male, but more evenly irrorate with dark scales on upper surface of wings; antennae with central portion weakly serrate.

LENGTH OF FOREWING: 18 (allotype) to 19 mm.

MALE GENITALIA: Very similar to those of *ceraea*, differing mainly as follows: uncus smaller, with posterior extension broader, apex bluntly pointed; gnathos with median area narrower, more pointed; anellus with posterior extension more narrowed medially, then sharply widened apically; aedeagus thicker and slightly longer; spines of vesica slightly larger.

FEMALE GENITALIA: Very similar to those of *ceraea*, differing as follows: sterigma with smaller elliptical sclerotized area, 0.25 mm. wide, with V-shaped area posteriorly; ductus bursae with posterior end twice as wide as elliptical area; corpus bursae with posterior sclerotized area longer and slightly wider, with stronger median loop; signum wider than long. Apophyses posteriores 2.2 mm. in length.

TYPES: Holotype, male, and allotype, female, Zacualpan, Mexico, Mexico, July, 1914 (C. C. Hoffmann). The genitalia of the holotype are mounted on slide FHR 16251, that of the allotype on slide 16232. Paratypes, all from Mexico: same data as types, July, 1914, August, 1914, September (C. C. Hoffmann), three males and one female; same locality as types, May, 1913 (R. Muller), "7/7," three males.

The holotype and allotype are in the collection of the American Museum of Natural History; paratypes are in the collections of that institution and of the National Museum of Natural History.

DISTRIBUTION: This species is known only from its type locality in the State of Mexico; this town is near the border of Guerrero, at an elevation of approximately 8000 feet.

TIME OF FLIGHT: May, July, August, and September.

REMARKS: Nine specimens (seven males, two females) and four genitalic dissections (three males, one female) have been examined.

ETYMOLOGY: The specific name is from the Latin *localis*, local, in reference to this species being known only from a single locality.

Mericisca (Merisma) summa, new species

Figures 65, 72

DIAGNOSIS: This species is very similar to *localis* but can be recognized by the longer pectinations in the antennae of the male and the less dentate nature of the t. p. and extradiscal lines on the upper surface of the wings.

MALE: Head, thorax, and abdomen similar to those of *localis*; antennae with about 60 segments, terminal 12 simple, longest pectinations twice as long as basal segment, being 0.38 mm. in length.

VENATION: Similar to that of *ceraea*.

UPPER SURFACE OF WINGS: Forewings similar to those of *localis*, differing mainly in cross lines; median line more deeply angulate, with distal shade band tending to be absent in middle of wing; t. p. line more evenly curved, thickened on veins, not dentate as in *localis*; s. t. line complete, tending to be more clearly represented; terminal area with more dark scaling. Hind wings similar to forewings but more evenly colored; very similar to those of *localis*, but intradiscal line without shade band; extradiscal line weakly curved, slightly thickened, outwardly projecting on veins, not dentate, and without quadrate patch on anal margin; subterminal area without pale median band.

UNDER SURFACE OF WINGS: Similar to those of *localis*, but with nebulous, dark, subterminal band on hind wings.

LENGTH OF FOREWING: 19 mm. (holotype).

FEMALE: Unknown.

MALE GENITALIA: Very similar to those of *ceraea*, differing mainly as follows: valve with broader apex; vesica with more slender, apically pointed terminal spine, with lateral paired spined areas less heavily sclerotized.

FEMALE GENITALIA: Unknown.

TYPE: Holotype, male, Guerrero Mill, Hidalgo, Mexico, elevation 9000 feet (Mann and

Skewes). The genitalia are mounted on slide FHR 16253.

The unique type is in the collection of the American Museum of Natural History.

DISTRIBUTION: The high mountains of the State of Hidalgo.

TIME OF FLIGHT: Unknown.

REMARKS: One specimen and one genitalic dissection have been studied.

ETYMOLOGY: The specific name is from the Latin *summus*, highest, in reference to the elevation at which the type was captured.

SUBGENUS *TRACHEOPS* HULST, NEW STATUS

Tracheops HULST, 1896, p. 365. DYAR, "1902" [1903], p. 331. SMITH, 1903, p. 78. BARNES AND MCDUNNOUGH, 1917, p. 119. MCDUNNOUGH, 1938, p. 166.

DIAGNOSIS: The single included member of this subgenus can be recognized by the presence of the spinose projection from the posterior end of the fore tibia; it is strongly developed in the adults of both sexes.

ADULTS: Head with front slightly raised above level of eyes, swollen medially, weakly punctate; antennae of male with about 58 segments, terminal 12 simple, longest pectinations one and one-fourth times longer than basal segments, and 0.2 mm. in length; antennae of female moderately serrate in central portion of shaft. Thorax with foreleg having elongate spinose projection at distal end, well developed, of about equal length in both sexes; hind leg of male without hair pencil or groove. Abdomen without row of setae on ventral surface of third segment. Forewings with both 12 veins and areole; R_{1+2} short stalked, with R_1 branching almost immediately to unite with Sc for short distance before becoming free.

MACULATION: Well represented on upper surface of forewings, olivaceous green, with definite cross lines; hind wings much paler, with reduced maculation.

MALE GENITALIA: Uncus broad, having slight constriction above base, weakly tapering, with wide, scarcely rounded apex; socius absent; gnathos heavily sclerotized, sides of even width, and elongate, pointed median enlargement; valves having apical setose area, with setae continued basally along costa, inner face otherwise unornamented, with weakly sclerotized, scarcely differentiated sacculus; anellus with wide posterior extension; aedeagus shorter than combined lengths of uncus, tegumen, and saccus; vesica with terminal spine (when exserted) and with small, anterior, paired, lateral spinose areas.

FEMALE GENITALIA: Sterigma with ovate, sclerotized, median area; ductus bursae short, scarcely differentiated from corpus bursae; ductus seminalis arising posteroventrally; corpus bursae with narrowed posterior portion partially sclerotized, and with large, globular, membranous anterior portion; signum ventral, relatively large, and having few rays. Apophyses posteriores 1.9 to 2.3 mm. in length.

EARLY STAGES: Unknown.

FOOD PLANTS: Unknown.

TYPE SPECIES: *Tracheops bolteri* Hulst; by original designation.

DISTRIBUTION: From southern Arizona and New Mexico in the United States, south to the State of Puebla in Mexico.

REMARKS: This is the first placement of *Tracheops* in the Cleorini; in fact, it is the first time it has been placed in a tribe.

Mericisca (*Tracheops*) *bolteri* (Hulst), new combination

Figures 81, 82, 83, 84, 85, 86

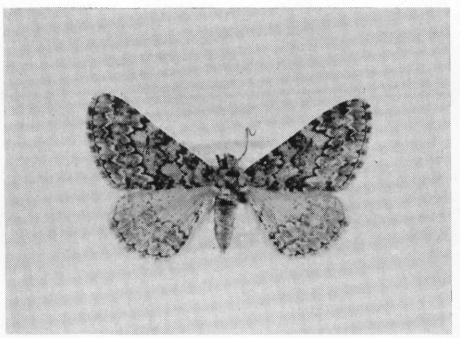
Tracheops bolteri HULST, 1896, p. 366. DYAR, "1902" [1903], p. 331; 1904, p. 106. SMITH, 1903, p. 78. BARNES AND MCDUNNOUGH, 1917, p. 119. MCDUNNOUGH, 1938, p. 166. RINDGE, 1955, p. 138.

DIAGNOSIS: The subgeneric diagnosis will serve to distinguish this species.

MALE: Head, vertex white, faintly greenish between antennal bases; front white, with small amount of greenish, dark gray, or black scaling distally, second segment black, third segment white. Thorax above with white and faintly greenish white scaling, having black scales at end of collar, across patagia and thorax, with two small pairs of spots around posterior tufts; below white or grayish white; legs white, with variable amounts of grayish brown or black scales on outer surfaces, all tarsi dark and white in approximately equal amounts. Abdomen above and below pale grayish brown or grayish white, with a few scattered darker scales.

VENATION: See subgeneric description.

UPPER SURFACE OF WINGS: Forewings olivaceous green, with white and black scaling;



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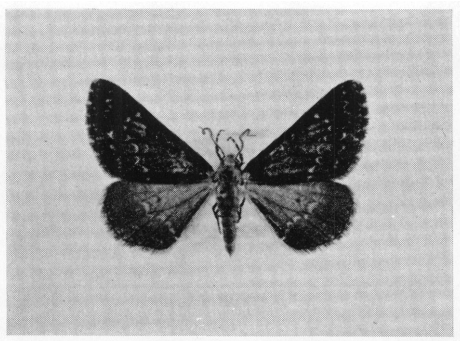


FIGS. 82, 83. Adults of *Mericisca* (*Tracheops*) *bolteri* (Hulst). 82. Normal male, Madera Canyon, Arizona, July 21, 1947 (J. A. Comstock and L. M. Martin; AMNH). 83. Melanistic male, Sunnyside, Arizona, July 7–17, 1958 (W. Davies; LAM). All figures × 1.3.

cross lines black, complete, definite; basal line present; t. a. line arising as spot on costa one-fourth of distance from base, crossing radial vein at right angle, outwardly bicurved, with sharp basal bend in cubital cell, having basal, greenish black shade band extending from black spot on costa; median line arising as spot on costa just basad of middle, in course basically similar to that of t. a. line, and usually having broad, rather diffuse, grayish green posterior shade band; discal dash present, in some specimens at edge of median shade band; t. p. line arising on costa two-thirds of distance from base, outwardly curved then subparalleling outer margin, strongly dentate and prominent; subterminal area with narrow white band and broad olivaceous green band distad of t. p. line, having some white or pale grayish white scaling anteriorly; s. t. line white, dentate, tending to be somewhat obsolescent in middle of wing, more or less narrowly bordered by black scaling; terminal area olivaceous green, with grayish green scaling, some specimens having grayish white area near middle of outer margin; terminal line black, having large intravenular spots, with line interrupted by veins in some specimens; fringe checkered grayish black and white. Hind wings white, with scattered black or grayish black scales, becoming very pale olivaceous green distally; intradiscal line either absent or represented on anal margin by a few black scales; discal dot small; extradiscal line weakly represented, varying from dots on veins to being complete, having nebulous, incomplete distal shade band; subterminal line white, incomplete, represented mainly by darker scaling on both sides; terminal line and fringe similar to those of forewings.

UNDER SURFACE OF WINGS: White; forewings with considerable grayish black scaling, reflecting pattern from upper surface; hind wings with discal spot and extradiscal line; all wings with terminal line present, interrupted by veins, with checkered fringe.

LENGTH OF FOREWING: 13 to 17 mm.

FEMALE: Similar to male, but with more dark scaling and maculation on upper side of hind wings; under surface with more dark scaling.

LENGTH OF FOREWING: 12 to 17 mm.

MALE GENITALIA: As described for the subgenus.

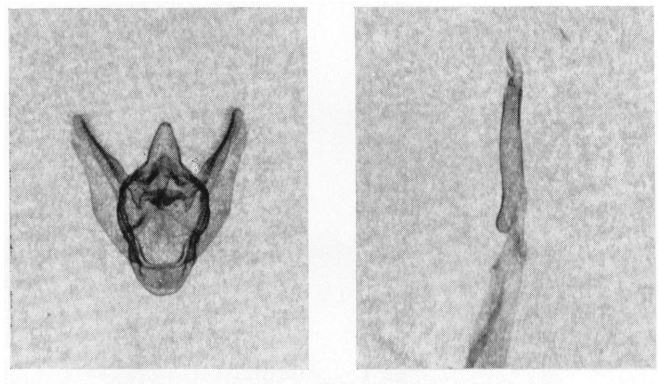
FEMALE GENITALIA: As described for the subgenus.

TYPE: Hulst apparently described *bolteri* from a single male specimen, although he did not definitely state this. The type is in the collection of the American Museum of Natural History (Rindge, 1955, p. 138).

TYPE LOCALITY: Las Vegas, San Miguel County, New Mexico.

DISTRIBUTION: Southeastern Arizona and New Mexico (fig. 81), south on the Sierra Madre Occidental range in Mexico, being known from Chihuahua, Durango, Jalisco, Distrito Federal, Mexico, Morelos, and Puebla. Apparently this species flies at moderate elevations, from below 5000 to about 6500 feet, except at the southern end of its range, where it has been taken at about 8000 feet.

TIME OF FLIGHT: April through October. Most specimens examined have been dated from



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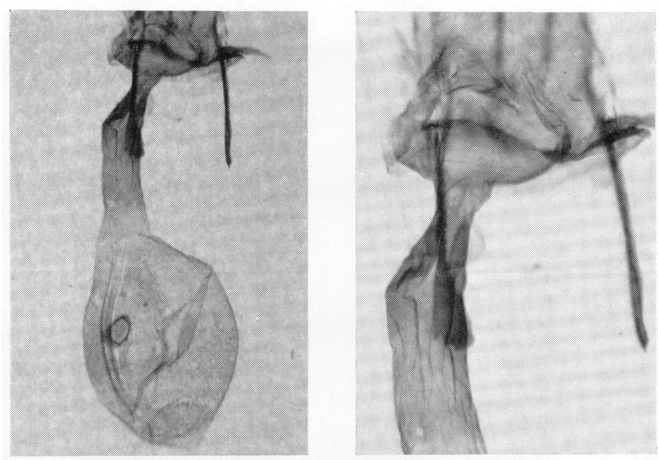

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FIGS. 84–86. Genitalia of *Mericisca* (*Tracheops*) *bolteri* (Hulst). 84. Male, Ramsey Canyon, Arizona, May 26, 1969 (R. F. Sternitzky; AMNH). 85, 86. Female, Santa Barbara, Chihuahua, July 18, 1947 (W. Gertsch and M. Cazier; AMNH).

late June to early September. The relatively few records from April and May would indicate that the species is at least partially double brooded under optimum conditions.

REMARKS: Three hundred ten specimens (196 males, 114 females) and 20 genitalic dissections (13 males, seven females) have been studied.

There is some variation in the color of the upper surface of the forewings. The green does not usually fade when moistened; however, it is a somewhat fugitive color as it does tend to become paler in old specimens.

One melanistic specimen has been studied (fig. 83); it is the only melanic individual known for the entire genus. This male is from Sunnyside, west side of Huachuca Mountains, Cochise County, Arizona, July 7–17, 1958 (T. W. Davies; in LAM). The upper surface of the forewings are an even black, with white scales marking the weak t. a., the stronger t. p. and s. t. lines; the fringes are black, checkered with white opposite the vein endings. The hind wings are grayish black, darkening distally, with a black discal dot, complete extradiscal and partial s. t. lines. The under surface of all wings is grayish black to black, with traces of the maculation of the upper surface showing through.

LIST OF SPECIES WITH THEIR KNOWN DISTRIBUTION

SUBGENUS *Mericisca* HULST, 1896

1.	*gracea* Hulst, 1896	Colorado, Utah, Arizona, New Mexico; Durango
2.	*rufa*, new species	Coahuila
3.	*munda*, new species	Chihuahua
4.	*perpictaria* (Barnes and McDunnough), 1916	Arizona
5.	*uniformis*, new species	Distrito Federal, Morelos
6.	*scobina* Rindge, 1958	Colorado, Arizona, New Mexico
7.	*macguffini*, new species	Durango

Puebla, NEW SUBGENUS

8.	*aztecaria* (Schaus), 1897 *undulosa* (Druce), 1898	Veracruz, Puebla, Tamaulipas, Chiapas
9.	*parva*, new species	Puebla, Oaxaca

SUBGENUS *Parapheromia* McDUNNOUGH, 1920

10.	*gicaria* (Schaus), 1901 *giacria* (Schaus), 1901 (*lapsus calami*)	Jalisco, Morelos, Puebla
11.	*elpidata* (Dyar), 1912 *interbrunnea* (Dyar), 1912	Coahuila, Durango, Aguascalientes, Guanajuato, Puebla, Guerrero
12.	*cassinoi* (McDunnough), 1927	Arizona, western Texas; Chihuahua
13.	*lichenaria* (Pearsall), 1906	Arizona, New Mexico, western Texas; Chihuahua
14.	*ficta*, new species	Arizona, New Mexico
15.	*configurata* (Hulst), 1898	Colorado, Arizona, New Mexico; Chihuahua, Durango
16.	*falsata* (McDunnough), 1920	Arizona, New Mexico; Chihuahua

SUBGENUS *Merisma* McDUNNOUGH, 1920

17.	*spododea* (Hulst), 1896	Wyoming, Colorado, Utah, Arizona, New Mexico, western Texas; Chihuahua, Coahuila, Durango
18.	*cryptapheles* (Dyar), 1913	Pueblo, Mexico
19.	*clandestina*, new species	Puebla
20.	*ceraea* (Rindge), 1958	Arizona
21.	*cretafunda* (Dyar), 1912	Veracruz, Durango
22.	*localis*, new species	Mexico
23.	*summa*, new species	Hidalgo

SUBGENUS *Tracheops* HULST, 1896

24.	*bolteri* (Hulst), 1896	Arizona, New Mexico; Chihuahua, Durango, Jalisco, Distrito Federal, Mexico, Morelos, Puebla

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