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A STUDY OF THE SPECIES OF THE GENUS *STETCHIA* (LEPIDOPTERA, PHALAENIDAE, HADENINAE)

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In the 1938 "Check list of North American Lepidoptera" five species and one subspecies were included in the genus *Stretchia*. Of these, *behrensiana* Grote was only doubtfully placed under this generic heading, owing to a certain similarity caused by the confluent nature of the orbicular and reniform spots. The species is entirely unknown to the author apart from Hampson's illustration of the type female (1905, Catalogue of the Lepidoptera Phalaenae in the British Museum, vol. 5, p. 390, pl. 89, fig. 10); if, however, Smith's identification should prove correct (1891, Trans. Amer. Ent. Soc., vol. 18, p. 120) then his figure of the male genitalic clasper (*ibid.*, pl. 2, fig. 9) would indicate that the placement in *Stretchia* is erroneous. In the present paper therefore *behrensiana* is omitted from consideration.

Considerable difficulty has been experienced in the past in securing adequate determinations of the remaining and strictly congeneric species, viz., *plusiiformis* H. Edwards, the genotype, with its so-called variety *coloradicola* Strand, *prima* Smith, *inferior* Smith, and *muricina* Grote. Since the unique specimens on which four of these names were based are all contained in the collection of the American Museum of Natural History, the occasion seemed opportune to initiate a study of these types and their genitalia with a view to clarifying the situation and securing definite identifications. As, apart from the types, the American

¹ This study was accomplished under the sponsorship and through the generosity of Mr. Cyril F. dos Passos, Research Associate in the Department of Insects and Spiders of the American Museum of Natural History.

Museum material was very inadequate for such a project, recourse was had to other institutions and collectors, and through the generous response of the curators of the United States National Museum, the Canadian National Collection, and the Los Angeles County Museum, as well as of Messrs. J. Sperry, W. Bauer, O. Buchholz, and others, a considerable number of specimens was brought together. Unfortunately what, at the outset, appeared to be a fairly simple procedure proved to be beset with many difficulties when it came to matching specimens with the types. In the first place all four types are in poor condition, being old, worn, and undoubtedly faded; in consequence accurate comparisons in respect to the coloration and maculation of the primaries were almost impossible without leaving a certain existing element of doubt. To further complicate the matter, it was found, when it came to making slides of the genitalia of these types, that in three instances, where the names were based on male specimens (*prima* was based on a female), J. B. Smith, following his usual custom, had broken off the right claspers in order to present figures of these portions of the organs in his *Perigrapha* revision (1889, Proc. U. S. Natl. Mus., vol. 12, pl. 22, figs. 2-4). As a consequence of this procedure the remainder of the genital organs had been either partially damaged or almost completely ruined and even when carefully mounted in Canada balsam, as has now been done, could not be compared with other undamaged mounts with any degree of certainty that the comparisons were correct. The similarity of maculation in all of the species together with a marked variation in the depth of the ground coloration of the primaries in series from certain localities was a further stumbling block. In only one instance, *inferior* Smith, did the male genitalia prove to be entirely satisfactory as a means of specific separation, and the differences between such female organs as could be examined were so slight as almost to prohibit their usage in this connection at the present time until more material could be procured for study.

The best means of separating the four described species has been found to exist in the structure of the female antennae, and using such a character it has been possible to fix fairly accurately the typical forms represented by the names involved. A certain element of doubt still exists as to whether each name represents a distinct specific entity or whether we are not dealing with a single species which is subject to considerable structural and color variation according to the localities in which the forms occur. This

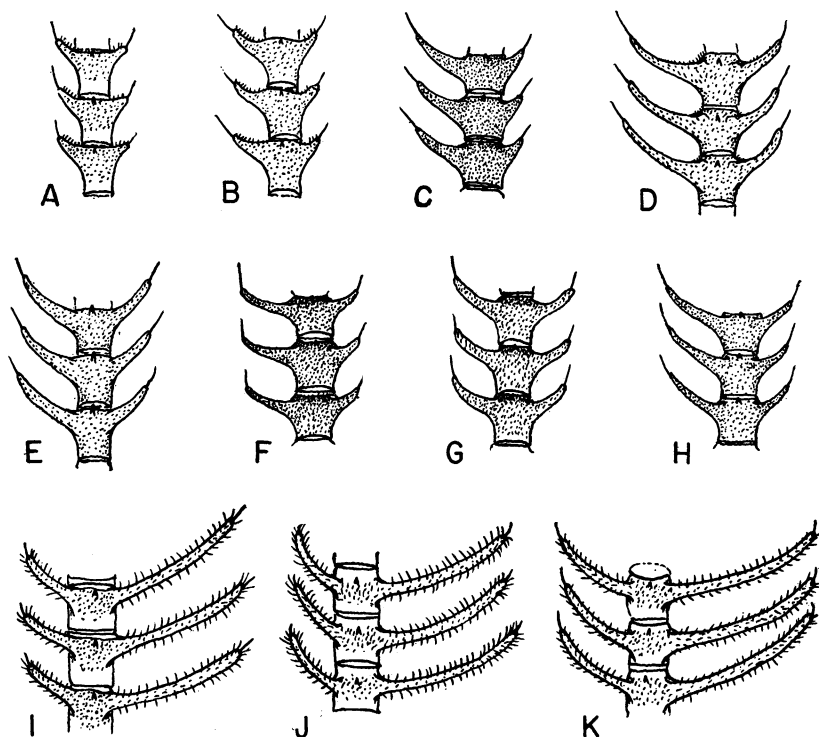


FIG. 1. Female antennal segments: A. *Stretchia prima*, holotype. B. *S. plusiiformis* (Dividend, Utah). C. *S. pictipennis*, allotype. D. *S. inferior* (Los Angeles, California). E. *S. muricina* (Vancouver Island). F. Variety of *S. muricina* (Medicine Hat, Alberta). G. Variety of *S. muricina* (Moscow, Idaho). H. *S. pacifica*, allotype. Male antennal segments: I. *S. plusiiformis*, holotype. J. *S. inferior*, holotype. K. *S. muricina*, holotype.

problem can be solved satisfactorily only by much more intensive breeding than has so far been done; for the present each name is considered as applied to a specific entity. The species separate into two groups: In one, comprising *plusiiformis* and *prima*, the female antennal segments appear trigonate when viewed ventrally and show only slight lateral projections; they may be classified as strongly serrate or denticulate. In the second group, including *muricina* and *inferior*, the antennae are definitely bipectinate, the pectinations considerably shorter than in the male sex but still falling obviously into this category. The illustrations emphasize these points, and further details may be found in the discussion of the individual species.

The distributional areas of the various species are still only incompletely defined. In a rough way it may be said that we have a Great Basin species, *plusiiformis*, fairly typical in Nevada (type locality) and Utah. In Colorado a somewhat darker color-form occurs to which the name *coloradicola* Strand is being applied in a rather doubtful racial sense; this extends up the Rockies into Idaho, eastern Washington, and adjacent sections of British Columbia. In the foothills of western Alberta specimens occur showing a range of color variation which covers both forms, and the species extends eastward in modified forms through southern Saskatchewan into sections of northern Ontario. Through the higher altitudes of the Sierras *prima* is found to occur, and what is apparently a slight variant of this species has been collected in the adjacent Charleston Mountains of southern Nevada. *Inferior* is known so far only from southern California (Kern and Los Angeles counties); in structural characters it is the most distinctive of the group, although superficially it bears a marked resemblance to *prima*. The larva recorded by Comstock and Dammers (1939, Bull. Southern California Acad. Sci., vol. 38, pp. 183-184) from Holy Jim Canyon, Orange County, California, under the name *plusiaeformis* might easily be properly referred to *inferior*, but no adults of this brood have been available for examination. The fourth species, *muricina*, is a Pacific coast form, occurring typically from northern Oregon (The Dalles, type locality) to southern Vancouver Island, British Columbia, most of the material available having been collected in this latter locality. It would appear to range into the south central section of the province, but the eastward distribution through Canada and the northern United States has proved one of the most puzzling problems of the whole study. Paucity of material, especially of females, is partly responsible for this, but then, too, an apparent deepening of the color of the primaries, especially in the typically pale terminal areas, simulates so closely the appearance of the darker forms of *plusiiformis* as to render a placement on color characters alone almost impossible. Such females as could be examined showed antennal structural differences, not only among themselves but also as compared with *muricina* and *plusiiformis*, and these differences are illustrated and discussed later at greater length. Obviously two courses are open for a reviser to follow: either to consider such variations as merely local changes, in which case the forms could at best be given only racial classifica-

tion, or to regard them as of specific value which would necessitate creation of several new names. Until adequate material is at hand for study it seems wisest to the author to leave matters standing *in statu quo* rather than complicate things by the addition of inadequately based names.

Two new specific names are proposed, based on more adequate Californian material. One of the new species falls close to *muricina*, of which it might be considered a race, and the other one belongs in the *plusiiformis* group. A more detailed treatment of the individual species follows.

***Stretchia plusiiformis plusiiformis* Henry Edwards**

Stretchia plusiiformis HENRY EDWARDS, 1874, Proc. California Acad. Sci., ser. 1, vol. 5, p. 267; 1874, Pacific Coast Lepidoptera, no. 4, p. 4. SMITH, 1893, Bull. U. S. Natl. Mus., no. 44, p. 208.

Perigrapha plusiiformis, GROTE, 1882, New check list, p. 31; 1883, Proc. Amer. Phil. Soc., vol. 21, pp. 149-171. SMITH, 1889, Proc. U. S. Natl. Mus., vol. 12, pp. 491-492, pl. 22, fig. 3 (genitalia).

Stretchia plusiaeformis, HAMPSON, 1905, Catalogue of the Lepidoptera Phalaenae in the British Museum, vol. 5, p. 364, fig. 97. DRAUDT, in Seitz, 1924, Macrolepidoptera of the world, vol. 7, p. 154, pl. 23b (poor figure). BARNES AND BENJAMIN, 1929, Bull. Brooklyn Ent. Soc., vol. 24, p. 180.

This species was described from a single male specimen stated to have been captured by W. S. Edwards at White Pine, Nevada, in August. The date of capture is open to question, as all members of the genus are known to fly in the early spring months. The locality is in Storey County, in the vicinity of Virginia City, and consequently on the western edge of the Great Basin area. The holotype (and genotype as well) bears, besides the name label, a written label "2920, Nevada." The specimen is in very worn condition, possibly owing to the late date of capture, and fringes are entirely lacking. Only the right antenna remains, and the genitalia show a certain amount of damage, done by J. B. Smith when the right clasper was removed for purposes of illustration.

No topotypical specimens have been available for examination, but Hampson's text figure of a Nevada male would appear to be fairly accurate. A series of males and females received from the United States National Museum and the Los Angeles County Museum, and collected at Stockton and Dividend, Utah, in late April and early May by T. Spalding, seems, as far as could be ascertained by a careful comparison, to match the type very

closely, and it is proposed to consider these specimens as typical of the species. Four males and one female from Pullman, Washington, kindly sent for study by Professor M. T. James of the State College of Washington, also run fairly close to Utah specimens although somewhat brighter in coloration; in one of these males the stigmata are separated. In a fifth male from the same locality the primaries are much deeper in coloration and the stigmata are barely contiguous; this specimen apparently is transitional to *coloradicola*.

In such specimens as those above mentioned the vestiture of the head and thorax is, in general, a deep smoky gray; the basal portion of the collar is tinged with light brown, at times obscured by the rough squamation, and there is the usual apical black band preceded by a fine dark hair line. The patagia are paler than the balance of the thorax, showing considerable whitish suffusion and a black posterior banding. The thoracic and abdominal tufts of segment I are mixed black and white. The abdomen is light brownish. In the male the ground color of the primaries is a rather even deep smoky gray, tending to become somewhat paler in the subterminal area. The confluent orbicular and reniform form together a broadly open U, more so, in general, than in *muricina*. Their color is somewhat paler than the ground color but not prominently so as in *muricina*, the filling being a dull grayish white. The interior margin of the spots shows the customary white border line edged outwardly with black, and there is a trace of brownish shading in the reniform which frequently shows a small dark spot in its lower outer corner. Occasional specimens occur in which the stigmata are contiguous but not confluent; this character has apparently little specific value, contrary to the opinion held by J. B. Smith. Dull brownish but rather obscure shading occurs in the central area of the wing below the spots and gradually merges into the ground color; in some male specimens this darker shading is entirely lacking, the coloration in consequence being an even deep gray. The balance of the maculation is improminent with the exception of a black basal dash ending before reaching the t.a. line, a dark oblique costal streak before apex of wing and a more upright one before the tornus; these, in well marked specimens, may be more or less connected by a fine brown s.t. line. The costal half of the wing at the base shows white shading and is crossed by a single, irregular, basal half line; the t.a. line can be frequently traced in the

costal half of wing and bulges outwardly crossing the cell; the fine, single t.p. line is less evident, running parallel to outer margin and forming outward teeth on the veins which are tinged with blackish in the subterminal area, broken by minute pale spots; there is a fine, black, crenulate, terminal line and the fringes are more or less concolorous with a median pale line and the outer half checkered with blackish intravenular spotting. The secondaries are evenly deep smoky with dull ochreous fringes. Beneath light smoky, the primaries more or less even in color with slightly paler terminal area, the costa narrowly brownish with three small white ante-apical spots. The secondaries paler, heavily sprinkled with smoky dots, with a prominent dark discal spot and a more or less evident postmedian line, parallel to outer margin.

In the females the maculation is much more intense, as seems usual in this sex. The brownish shading on the primaries around and below the confluent spots is deeper, and in consequence the spots themselves stand out more sharply; the subterminal area is definitely paler. The secondaries and the under side show no differences.

ANTENNAE: The greater portion of the right antenna of the holotype was intact with only the apical segments missing. A slide has been made of this, and the drawing illustrates the under side of three segments, nos. 21-23, from the middle section.

In the male antenna the basal six to eight segments are simple; short pectinations begin to appear on the following segments, and these quickly increase in length, the full size being attained at approximately segment 15; towards the apex there is a gradual tapering off in the length until in the apical fifth the pectinations disappear, the segments being narrow and bead-like with a short terminal bristle. For the greater part of their length, therefore, the antennae may be classified as strongly bipectinate, the inner branch long and slender, the outer one scarcely half the length of the inner one. Both are moderately setose and terminate in a short bristle; the insertion on the main stalk is at the distal margin, and a small spine occurs in the median area between the two bases.

As compared with the male antennae of the allied species, the differences are very slight and are hard to evaluate in dried specimens. From a study of slide material it would seem as if the outer pectination in *plusiiformis* is somewhat shorter than the corre-

sponding one in the other species, but this character may not have a great deal of value and can be used only with caution.

The female antennae offer a much better specific character than do those of the males. Unfortunately material in this sex has been very limited, and the antennae, in such specimens as were available, were frequently broken off, making it impossible to check the range of variation as fully as should have been done.

From a female of the Dividend, Utah, series a slide of the left antennae has been prepared and an illustration of the under side of segments 25 to 27 given. The basal and terminal segments are simple, as in the male, but to a somewhat greater extent. In the median area the structure might be more accurately defined as strongly dentate or serrate rather than bipectinate. Each segment has, when viewed ventrally, a broad trigonate appearance; on the outer side there is a slight apical projection with a longer one on the corresponding inner side which might almost be termed a short pectination; towards the distal end of the antenna these projections tend to become subequal, owing to a shortening of the inner branch; a distinct terminal bristle is present on each side, and the whole segment is thickly covered with extremely short, fine setae. In structure the antennae differ markedly from those of *muricina* and *inferior* which are distinctly bipectinate. They are, however, very close to those of *prima*, as typified by the female holotype, in which each antennal segment is even more definitely trigonate with scarcely any distad projection on the outer side.

MALE GENITALIA: As noted in the introduction the right clasper had been broken off by J. B. Smith. The balance of the organ was found to be fairly intact, and it has been possible therefore to give an illustration of the left clasper with the exception of the proximal portion which had been damaged; a complete drawing of the organ, based on a Utah specimen, is also presented. The uncus is broadly spatulate, short, with a truncate distal margin; it is strongly setose; individual specimens show variation in width and length. The tegumen is moderately broad, conical, with a small peniculus. The cephalic end is extended into a long, bluntly pointed saccus or vinculum. The claspers show a slight asymmetry; a fairly well chitinized sacculus bulges in a rounded, feebly spiculate projection over the costal edge of each clasper at base (the "obtuse lappet" of Smith). The cucullus has a rather broad neck and is variable in shape, being at times rounded

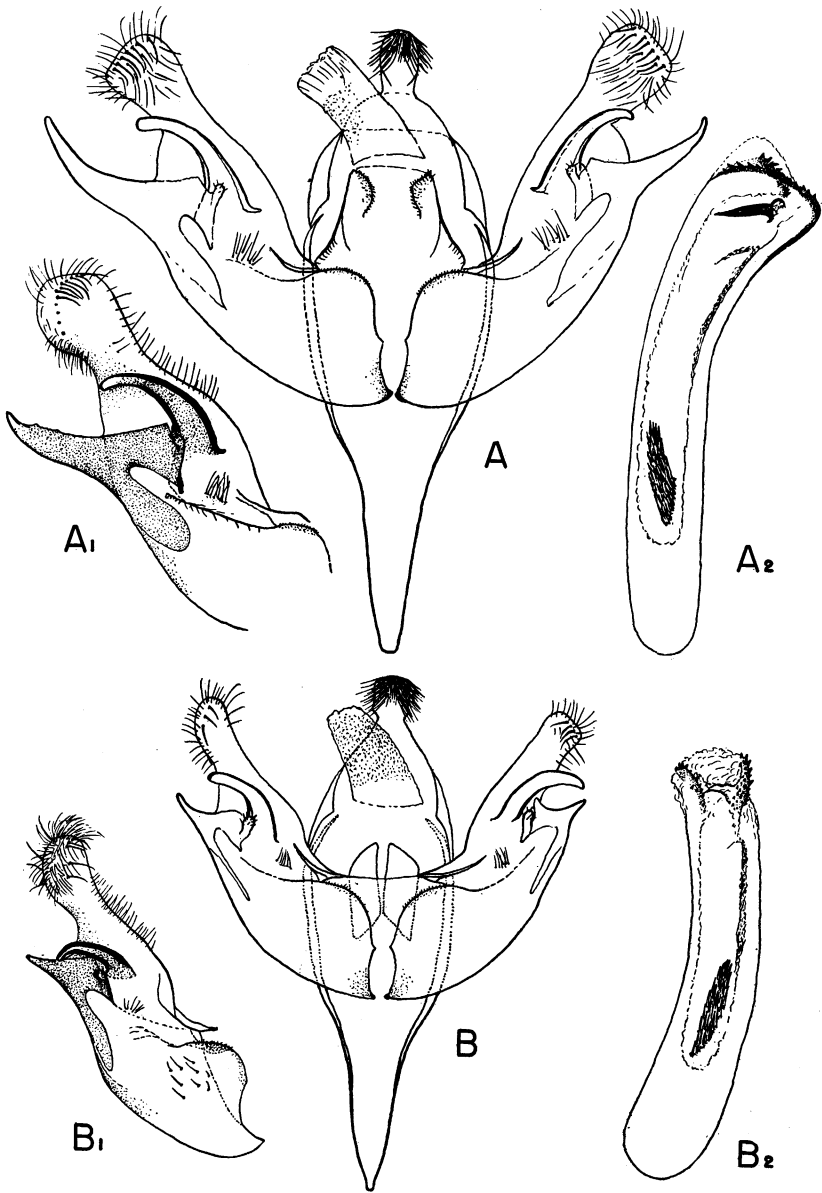


FIG. 2. A. Male genitalia of *Stretchia plusiiformis* Edwards (Dividend, Utah). A1. Left clasper of holotype of same species. A2. Aedeagus of Utah specimen. B. Male genitalia of *Stretchia inferior* (Smith) (Los Angeles, California). B1. Left clasper of holotype of same species. B2. Aedeagus of same.

apically, in other cases more truncate in appearance; it shows a weak corona, also variable, besides a sparse covering of long hairs. The interior armature of the clasper is somewhat similar to the structure found in the genus *Euxoa*. It consists of two projections; the inferior one, which is really an apical extension of the sacculus, projects obliquely over the ventral margin as a long, up-curved hook; the dorsal one, the harpe proper, arises from the central area and is strongly chitinized and bent downward apically, attaining to, or projecting slightly over, the ventral margin of the clasper; at its base is a small, raised tubercle which shows a few apical setae. The juxta is weakly chitinized and broadly rectangular. The anellus lobes are well chitinized laterally and finely spiculate. The aedeagus is somewhat curved dorsoventrally and moderately broad; apically there is present on one lobe a curved chitinous band, armed with short teeth, opposite which, on the other lobe, is a smaller dentate patch. A strong short spine with broader base is generally present in the apical region of the vesica but at times (for instance in the type slide) is missing, having been doubtless injected into the female bursa during copulation; in the proximal portion is a closely appressed, spindle-shaped bundle of cornuti.

FEMALE GENITALIA: In a slide of a Dividend, Utah, female no differences could be detected that might be used to separate the species from *prima* (*vide* illustration).

REMARKS: Typical *plusiiformis* is here considered as being a species of the Great Basin area, occurring in Nevada, Utah, and eastern Washington. West of the continental divide in Colorado the species assumes a somewhat darker coloration as exemplified by long series in the United States National Museum and other collections from Glenwood Springs, mostly collected by Barnes. Such specimens seem to be transitional to a still darker form found east of the divide in the foothill country and to which the name *coloradicola* Strand is being applied rather doubtfully in a racial sense.

TYPE: Holotype, male, White Pine, Storey County, Nevada, in the collection of the American Museum of Natural History.

***Stretchia plusiiformis coloradicola* Strand**

Stretchia plusiiformis, DYAR, 1902, Proc. U. S. Natl. Mus., vol. 25, p. 377.
HOERNER, 1937, Jour. Econ. Ent., vol. 30(6), p. 900 (biology).

Stretchia plusiaeformis subsp. 1 HAMPSON, 1905, Catalogue of the Lepidoptera Phalaenae in the British Museum, vol. 5, p. 365.

Stretchia plusiaeformis var. *coloradicola* STRAND, 1916, Arch. Naturgesch., div. A, vol. 82, no. 2, p. 30.

The name *coloradicola* was proposed for Hampson's subspecies no. 1 of *plusiiformis*, based on a single male labeled "Colorado (Bruce)." The diagnosis by Hampson is as follows: "Much darker; fore wing rather broader; stigmata not conjoined, the orbicular oblique elliptical, the reniform oblique oblong, the area around them slightly darker; postmedial line closely approximated to reniform and straight from below costa to vein 4."

It is impossible to fix the type locality exactly, as Bruce was known to have collected in various sections of the state. Until the type in the British Museum can be carefully studied, it is also rather futile to try to match the type specimen with other material, using Hampson's brief and rather vague description as a basis. However, among the material collected and bred by Dyar in the vicinity of Denver, consisting of 11 males and four females, all of which are before the writer, three male specimens are present in which the orbicular and reniform are not confluent although quite normally conjoined in the balance of the material. As the deeper coloration also appears to fit in quite well with the original diagnosis, these three specimens are considered, for the purposes of the present article, as being topotypical. Hoerner (*ibid.*, fig. 2) figures two specimens of the same race, bred from larvae found destructive to gooseberries at Manzanola, Colorado, and a long series of rather undersized specimens from this source has been placed in the United States National Museum. Considerable variation in depth of coloration is evident in this material. Two males and a female in the United States National Museum from "Clear Creek, Jeff. Co. Colo. 6-7000 ft." show a deeper and brighter coloration than any of the aforementioned specimens. The stigmata are whiter and, in the males, merely contiguous. It is possible that these are more representative of the name *coloradicola* than the Denver specimens already mentioned.

The name *coloradicola* as here employed in a rather broader sense designates the very variable form occurring in the Rocky Mountain area and extending northward through Idaho into southern British Columbia and the western section of the province of Alberta. Numerous specimens collected at Wallace, Idaho, in April and May by O. Huellemann show considerable variation,

in both coloration and intensity of maculation. While a fair proportion of the material bears a close resemblance to that from Colorado, other specimens, notably females, are brighter in coloration with greater contrast between the brown median areas and the paler, deep bluish gray, terminal portions of the primaries. In such specimens the maculation is more clearly defined, the black basal dash is generally quite prominent, and the stigmata are normally joined. Some male specimens in the United States National Museum from Pullman, Washington, show a trend in this direction, although most of the specimens studied seem better placed in the topotypical race. A single male from Rossland, British Columbia, matches the Idaho material quite well. Dyar records the species from Kaslo, British Columbia (1904, Proc. U. S. Natl. Mus., vol. 27, p. 869), based on a single specimen in the Cockle collection, the date "September 27" being obviously a mistaken interpretation of the label "27.IV." as "27.IX." Material in the Canadian National Collection from Alberta (Calgary, Lethbridge) is less typical and tends in its paler coloration to approach closer to *plusiiformis*. On the other hand, two males in the same collection from Swift Current, Saskatchewan, are very similar to Colorado specimens. Much farther east a small series of six males was collected in early May by G. S. Walley at Smoky Falls, north of Kapuskasing in northern Ontario, this material being also deposited in the Canadian National Collection. With the exception of a single very light-colored specimen all specimens show a very deep purple brown ground color, the whole median area being suffused with a brighter brown color, especially below the stigmata, and the maculation being well defined. The male antennae appear to show slightly shorter pectinations than the Rocky Mountain form, but otherwise no structural differences could be detected. This Ontario series is matched by three specimens (two males, one female) in the United States National Museum, *ex* Barnes collection, from Hymers in the Thunder Bay District of northern Ontario; the female is dated "June 16-23" but the males, probably mistakenly, bear the label "Sept. 16-23."

STRUCTURAL DETAILS: No differences of any consequence could be noted in either antennal structure or genitalia from those of the nimotypical form. A tendency was shown in some females for the lateral serrations of the antennae to be slightly longer, but this did not appear to be constant in the small series of this sex avail-

able for examination. The male genitalia match on the whole very well those of a Utah specimen given in the figure, but it should be noted that in some of the bred *Manzanola* series the length of the inferior projection of the harpe appeared to be shortened and somewhat aborted.

TYPE: Holotype, male, Colorado (?Denver region), in British Museum (Natural History).

***Stretchia prima* (Smith)**

Perigrapha prima SMITH, 1891, Trans. Amer. Ent. Soc., vol. 18, p. 119; 1893, Bull. U. S. Natl. Mus., no. 44, p. 209. HOLLAND, 1903, Moth book, p. 205, text fig. 116 (type). HAMPSON, 1905, Catalogue of the Lepidoptera Phalaenae in the British Museum, vol. 5, p. 404. DRAUDT, in Seitz, 1924, Macrolepidoptera of the world, vol. 7, p. 157.

Stretchia prima, BARNES AND BENJAMIN, 1929, Bull. Brooklyn Ent. Soc., vol. 24, p. 180.

The name *prima* was based on a single female in the Henry Edwards' collection. This specimen, considerably worn and lacking fringes, bears the label "Sier. Nev. Cal.," and no further information as to the exact locality is available from the Edwards' catalogue. In general, specimens bearing such a label are supposed to have been collected in the Donner Pass region between Summit and Truckee, but there is no possibility of verifying this in the present instance. Holland's figure of the type is fairly accurate, apart from being too dark. The primaries, basad of the subterminal area, show a coloration of a deep smoky purplish gray deeper than in *inferior* and without any trace of brownish shading over the central area of the wing. Under a lens they appear rather heavily sprinkled with white, and the cross lines are more evident than in allied species. The orbicular and reniform are outlined in white and show a whitish gray filling; they are not confluent, as in other species, but are barely contiguous at their bases. It is very doubtful, however, whether this character has the value assigned to it by Smith as a means of specific separation. Specimens, especially females, of *muricina* and *coloradicola* have been met with that show the same feature. It would appear to be merely a rather rare, individual variation, possibly more prevalent in *prima* than in the other species. The subterminal area of the primaries is contrastingly pale, forming a grayish white band across the wing. The terminal area is darker again but less dark than the basal two-thirds. The secondaries

and under side are much as in the other species. The larger portion of the left antenna was present in the type, and from a slide made of this it is evident that *prima* must be closely allied to *plusiiformis*, the trigonate segments being even less dentate than in this species with practically no projection on the outer side, as may be noted from the illustration given.

While it has been impossible to match the type exactly with any of the material available, a female specimen has been found in the American Museum collection bearing the same vague locality and collection labels. This specimen, also much worn, differs in that the orbicular and reniform are confluent and less conspicuous, and the subterminal area is less markedly pale. On the other hand, the general wing coloration matches well, the antennal structure is similar, and the genitalia (to be dealt with later) show no obvious differences. This would appear to strengthen the opinion that the type of *prima* is a rather aberrant specimen, but the puzzle can be definitely solved only when more material is available and when the type can be more closely matched than is now possible. A worn male with the same indefinite locality label, originally from the Smith collection, is in the United States National Museum, and a genitalic slide (not examined) has been made by F. H. Benjamin.

If it is assumed for the present that the second Sierra Nevada specimen is correctly identified as *prima*, two well-matching males in the Los Angeles Museum material, collected at Huntington Lake, Fresno County, altitude 6900 feet, on June 26, could be referred to this name. These specimens, while lacking the pale subterminal areas, possess contiguous rather than confluent spots and fairly well-marked cross lines. A single male from the Mt. Shasta region and a series of specimens from the Charleston Mountains, Nevada, collected in May, 1934, by Messrs. Comstock and Sperry would also appear to belong here. They show the same deep smoky gray color of the primaries, varying considerably in depth and intensity. In only one instance is there an indication of a pale subterminal band. On the other hand, the rather improminent spots in several specimens are merely contiguous, whereas in others they are confluent. Unfortunately in the single female in the series the antennae are entirely lacking so that this important character cannot be checked, but the genitalia match those of the type very closely. Benjamin appears to have reached the same conclusion regarding the identity of the Charles-

ton Mountains series, as one of the specimens examined bears his label "*Stretchia muricina prima* Sm." The reference of *prima* as a race of *muricina* is, of course, untenable. Besides a single Charleston Mountains male, the United States National Museum collection contains a male from Truckee, Nevada County, California, which matches the Huntington Lake material, and a female, simply labeled "Cal.," from the Graef collection, which shows the same antennal structure as the type. This specimen is, however, lighter in general coloration although possessing the separated stigmata and the pale terminal area.

ANTENNAE: There is nothing tangible in the structure of the male antennae whereby the species may be separated from *plusiiformis*. In the female, of which segments 25 to 27 of the holotype are illustrated, the only noticeable difference is that the short distal projection (tooth) on the outer side is still further reduced as compared with the corresponding part in *plusiiformis*. Whether such a character is constant or not can be determined only when further material is available for study.

MALE GENITALIA: Similar to those of *plusiiformis*. In four genitalic preparations examined (Huntington Lake, one; Charleston Mountains, three) no essential differences could be observed. Slight variation in the length of the inferior branch of the harpe is present in the individual specimens, and two of these show the apical spine of the vesica whereas in two others from the Charleston Mountains series it is absent.

FEMALE GENITALIA: A figure of the female organ from the holotype is given. Preparations from the second Sierra Nevada specimen, mentioned above, and from the single Charleston Mountains female agree completely. The ostium is broad and membranous, very finely spiculate. The ductus bursae is a broad, feebly spiculate, chitinous tube, slightly less than half the length of the bursa proper and strengthened laterally by chitinous rods; it narrows slightly in its distal half and enters the bursa at its proximal end on the dorsal side. The bursa copulatrix is a long membranous sac, the distal half of which is broadened into globular form and is provided with four long, narrow, equidistant, finely spiculate bands. At the proximal end, immediately ventrad of the entrance of the ductus bursae, a large secondary sac arises, extending down the right side of the bursa for half its length; at the junction of the two sacs there is a lightly chitinized, rather crenulate area. The ductus seminalis arises as a fine

membranous tube from the proximal section of this secondary sac, immediately ventrad of the termination of the ductus bursae.

REMARKS: *Prima* is being treated for the present as a species distinct from *plusiiformis*, but it could readily prove to be merely a race of this species, occurring in the higher Sierras and adjacent mountainous areas. There is very little difference in the structural details of the two, but in *prima* the deep gray coloration of the primaries with little trace of brown median shading renders it fairly easily separable from *plusiiformis*. In this respect it shows greater similarity to *inferior* which possesses, however, good differentiating structural characters.

TYPE: Holotype, female, Sierra Nevadas, California, in the collection of the American Museum of Natural History.

***Stretchia pictipennis*, new species**

Belongs in the *plusiiformis* group but shows sufficient differences of antennal structure and general coloration to warrant consideration as a good species.

Male antennae strongly bipectinate, the inner branch somewhat longer than that of *plusiiformis*; the female antennae shortly pectinate, the outer branch scarcely longer than in *plusiiformis* and hardly more than a serration, the inner branch much longer and forming a definite pectination (as illustrated); the whole segment is shorter and chunkier than that of *plusiiformis*. Squamation of head and palpi very rough with well-developed tuft on vertex. Palpi light brownish with slight admixture of black scaling. Head largely light gray, tuft of vertex brown. Collar light brown at base, upper half deeper brown, intermingled with white scaling and with a broad, dark, apical band. Patagia and thorax in general gray, the color formed by an admixture of black and white scaling; a slight trace of apical dark bands on patagia. Thoracic tufts tipped with dark brown, apex white. (In one paratype the brown coloration of head and collar is less obvious.) Primaries with the ground color a deep purple gray, this color predominating in the basal area before the t.a. line and in the terminal portion of the wing beyond the t.p. line. Median section between the t.a. and t.p. lines shaded with brown, especially deep around the stigmata, leaving traces of the ground color along costa and above the inner margin. Maculation as in the other species of the genus but more definite in character. Basal half line distinct, black brown, with slight out-

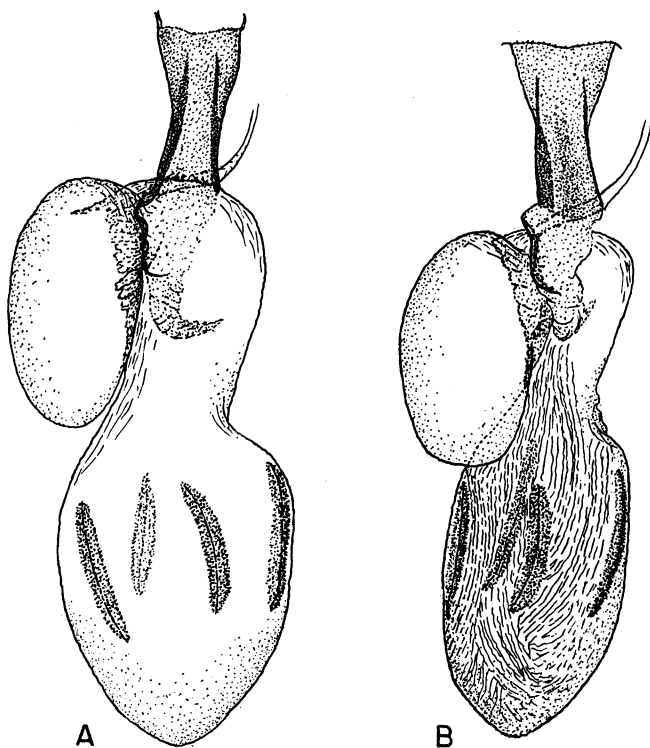


FIG. 3. A. Female genitalia of holotype of *Stretchia prima* (Smith) (Sierra Nevada, California). B. Female genitalia of *Stretchia muricina* (Grote) (Vancouver Island).

ward angle below costa, terminating at cubitus, along which are very faint indications of a dark basal dash (at times obsolete). Dark brown t.a. line distinct, especially in costal half of wing; it is outwardly oblique and consists of four scallops, small inward angles being formed on radius, cubitus, and vein 1. Orbicular and reniform confluent, forming the usual broad U mark; the filling of the orbicular and the inner half of the reniform pale gray, considerably lighter than the ground color; the outer half of the reniform more or less filled with rather ruddy brown. The lower and outer margins of the confluent spots are sharply outlined in white, this in turn being edged outwardly with black. The t.p. line is fairly well defined; starting from a point on costa above inner margin of reniform it angles sharply, continuing along radius to a point beyond the cell where it bends downward and runs al-

most rigidly inwardly oblique to inner margin; it is strongly dentate in its lower half, the dentations being more or less continued along the veins in the subterminal area by fine black streaks, broken by a row of small white dots. The s.t. line is, as usual, indicated at costa by a prominent, oblique, dark dash and at tornus by a less obvious, curved, black line; its course through the central area of the wing can be traced by the slight difference in the shades of color of the subterminal and terminal areas, the former being the paler; the line, as thus indicated, shows faint outward dentations. A broken, black, lunate, terminal line. Fringes dark with slight tinge of brown, cut basally and medially by fine, paler lines; they present a very slightly checkered appearance. Secondaries uniform deep smoky brown. Fringes concolorous with (at times) a slight ruddy tinge and a fine pale line at base. Beneath, primaries smoky with indications below costa of a postmedian line; costa with four small, white preapical dots. Secondaries paler with a slight ruddy tinge; a prominent discal spot and postmedian curved line. Expanse, 31 mm.

TYPE MATERIAL: Holotype, male, Mohawk, Plumas County, California, May 4, 1937 (W. Bauer), in the American Museum of Natural History. Allotype, female, same locality and collector, May, 1939, in same collection. Paratypes, one male, same locality and collector, May 7, 1937, in the Canadian National Collection, one male, same locality, May, 1940 (W. Winter), in collection Bauer; one female, same locality and collector, April, 1939, in collection Bauer.

REMARKS: The male genitalia show great similarity to those of *plusiiformis*. The lower branch of the harpe is generally slightly shorter but this, as well as the shape of the cucullus, is somewhat variable in the three slides examined. In the dentate patches at the apex of the aedeagus the teeth are seemingly stronger than those of allied species. No preparation of the female genitalia has been made.

The species has evidently been distributed in exchange by W. Bauer under the name of *plusiiformis*, an error for which I may be responsible: other specimens may therefore be found in certain private collections unknown to me.

***Stretchia inferior* (Smith)**

Perigraphia inferior SMITH, 1887, Proc. U. S. Natl. Mus., vol. 10, p. 447; 1889, *ibid.*, vol. 12, pp. 491-492, pl. 22, fig. 2 (genitalia).

Stretchia inferior, SMITH, 1893, Bull. U. S. Natl. Mus., no. 44, p. 207. HAMPSON, 1905, Catalogue of the Lepidoptera Phalaenae in the British Museum, vol. 5, p. 365. DRAUDT, in Seitz, 1924, Macrolepidoptera of the world, vol. 7, p. 154. BARNES AND BENJAMIN, 1929, Bull. Brooklyn Ent. Soc., vol. 24, p. 180.

The species was described from a single male specimen with habitat given merely as "California." Smith distinctly states that "the unique ♂ type is with Mr. H. Edwards," so that a so-called type male specimen in the United States National Museum, although bearing the same labels as the type, must be treated as merely topotypical. The specimen in the American Museum collection is hereby designated as the holotype, and some further data regarding locality are available from labels on this specimen. Besides Smith's species label there is a printed label "California" with "Havilah" written in above it. Further, there is a round disc bearing the number "7380" which refers to H. Edwards' original catalogue, the entry under this number confirming the above locality data and recording the collector as Stretch. Finally, there is a label, "No. 10916, Collection Henry Edwards," referring to an American Museum catalogue compiled after the Edwards' collection had been purchased by this institution. It seems fairly evident from this additional information that the vicinity of Havilah, Kern County, southern California, may be safely regarded as the type locality of the species. Following the short original description, Smith mentions, in discussing the genitalia, that the "clasper is bifurcate: the inferior branch very short and acutely terminated." This is borne out by the figure, given in his revision of 1889, of the right clasper and its appendages, drawn evidently from a portion broken off from the original type.

Among the material received for study from the Los Angeles County Museum three specimens were found (two males and one female) labeled as follows: one male, "Beverly Terrace, L. A. Co. Cal. Dec. 12-Jan. 5, '29"; the other male and the female simply "Los Angeles, Cal." with the dates, respectively, "Dec. 1-25, '28" and "Mar. 1-15, '28." Another Los Angeles male, "Feb. 5, 1921, Karl R. Coolidge," is in the United States National Museum, and a fourth male from the same locality, "Mint Canyon, Feb. 28, 1946," is in the American Museum of Natural History, kindly donated by F. H. Rindge. A genitalic slide made from the first-named specimen matches the above-mentioned figure quite closely in the shortness of the inferior branch of the

harpe, and a superficial examination of the other specimens shows the same character. As the suffused maculation of the forewings also coincides with that of the type and the locality is fairly close to the original one, there seems little doubt but that the five specimens may be placed as *inferior*. Based on these, the following more detailed description has been compiled.

The squamation of head, collar, and thorax is very rough, composed of mixed black and whitish scaling and giving a general deep smoky gray appearance with only the faintest tinges of brown visible. The basal portion of the collar is paler, and the darker apical half is crossed by a faint, blackish line followed by a more definite, apical dark band which is slightly tinged with brown. The patagia are paler laterally and are bordered with dark lines, not very obvious against the general dark background of the thoracic scaling. The thoracic and first abdominal tufts are also tipped with black. The abdomen is dull ochreous. The forewings are deep smoky gray with slight tinges of a purplish brown suffusion. There is some difference between the distinctness of the maculation in the male specimens. The one from which the genitalic slide has been made approaches closest to the type in this respect. The cross lines are scarcely traceable, and the confluent orbicular and reniform are only very slightly paler than the ground color, forming the usual broad, open U which is bordered inferiorly by a white line, most distinct on the outer side of the reniform. This line, in turn, is faintly edged with a darker black brown line, and below this the central area of the wing shows the merest trace of brown suffusion; the reniform is also slightly tinged with brown. A faint black brown oblique dash on the costa before the apex indicates the inception of the s.t. line, the usual similar mark before the tornus being practically absent. The subterminal area is very faintly paler than the smoky terminal space, crossing which the veins are slightly darkened, producing a somewhat dentate appearance. The fringes are concolorous with only the merest suggestion of a paler checkering. The hind wings are smoky brown with a thin pale line at the base of the concolorous fringes. Beneath, forewings light smoky, costa palish and with a dark mark at the inception of the t.p. line. Hind wings still paler, sprinkled with smoky atoms and with a large, dark discal spot. Fringes on both wings more distinctly checkered than above. Two males are more definitely marked on the forewings, and in one from the Los Angeles Museum a dark, basal half line

is distinctly visible, attached to the lower end of which is a short, black, basal dash. The irregularly curved t.a. line is marked by blackish in the costal half of the wing. The black inner border of the confluent spots is much more obvious, but the white line, on the other hand, is less noticeable. Dark streaks, broken by pale dots, mark the t.p. line. The dark ante-apical dash is strengthened, and the similar mark at tornus is also to be traced. Beneath, the hind wings show a broad postmedian line, parallel to the outer margin, as well as the usual large discal spot.

Two males from the United States National Museum collected in February at Glendale resemble the Los Angeles material very closely in coloration and maculation of the primaries. However, as far as can be told from an examination of the genitalia *in situ*, the lower fork of the harpe is somewhat longer, and placement as *inferior* will have to be checked further when more material, especially females, is available.

The female possesses certain points of difference from the males in the maculation of the forewings and bears considerable resemblance to a pale *muricina*. The confluent spots are distinctly marked in dull whitish, the reniform with a small dark spot in its lower angle. The surrounding area is rather broadly tinged with brownish, the color of the remainder of the wing being purplish gray. The other maculation is much as in the better-marked male specimens.

ANTENNAE: A slide has been made of the right antenna of the male holotype, and the same three segments as have been figured for other species (viz., segments 21–23) have been illustrated.

The male antenna is in general structure very closely similar to that of *plusiiformis*, but the points of insertion of the individual pectinations on the main shaft are distinctly more medial. The length of a pectination on the outer side in the area figured (farther distad the relative lengths vary somewhat) is slightly less than one-half of the inner pectination. This outer branch appears, in the slide material examined, to be very slightly longer than the corresponding one in *plusiiformis*, but in dried material such difference is scarcely appreciable.

The female antennae are quite characteristic, being definitely bipectinate, resembling in this respect those of *muricina*. As in the male the insertion of the pectinations on the main stalk is below the apical margin of the segment. The inner branch is thin

and pointed, terminating in a single bristle, the outer branch about half the length of the inner one. The whole segment is very finely setose. Compared with *muricina* the pectinations, especially on the inner side, are longer and thinner. The illustration is made from the antenna of the Los Angeles specimen previously mentioned. No other material has been available for study.

MALE GENITALIA: What was left of the genitalia of the holotype after Smith's mutilation has now been mounted in balsam. Parts of the tegumen were found to be broken, and the central portion, including the juxta and anellus, too badly damaged to be usable. The uncus was intact and is, as usual throughout the group, short, broad, and with truncate apical margin. It has been possible also to illustrate the left clasper and its appendages and also the aedeagus. For the sake of comparison a figure of the complete genitalia of a Los Angeles male is offered. It will be noted that there is a slight asymmetry between the two sides, but the short inferior branch of the harpe is quite characteristic and at once separates the species from its allies. In the Los Angeles specimen the harpe proper on the left side is less downcurved than in the corresponding portion of the type specimen, but this probably has little significance as the other parts match very closely. The corona of the cucullus is very weak. The anellus appears to be somewhat distorted, and its obvious difference in the drawing from that of *plusiiformis* should be discounted until more material can be examined. In the aedeagus of the type, as illustrated, the lobes are well separated, and the spining at their apices seems somewhat different to that found in *plusiiformis*. As such spining appears, in any case, a rather variable feature in the allied species, the apparent distinction must be verified, when more material is available, before the character can be used as diagnostic. It has also been noted that in the preparations of both the type and the Los Angeles specimen the strong apical spine of the vesica, present in *plusiiformis*, is missing. This may be due to the fact that it has been injected into the female bursa during copulation; in any case the matter needs further checking. Lack of material has made it impossible to study the female genitalia.

REMARKS: For the present the known range of this species is restricted to the localities mentioned above in Kern and Los Angeles counties, southern California. Further collecting will probably extend the area of distribution considerably.

TYPE: Holotype, male, Havilah, Kern County, California, in the American Museum of Natural History.

***Stretchia muricina* (Grote)**

Acerra muricina GROTE, 1876, Bull. Buffalo Soc. Nat. Sci., vol. 3, p. 85.

Graphiphora muricina, GROTE, 1876, Canadian Ent., vol. 11, p. 27.

Perigrapha muricina, GROTE, 1881, Canadian Ent., vol. 13, p. 133; 1883, Proc. Amer. Phil. Soc., vol. 22, p. 170. SMITH, 1889, Proc. U. S. Natl. Mus., vol. 12, pp. 491, 493, pl. 22, fig. 4 (genitalia).

Stretchia muricina, SMITH, 1893, Bull. U. S. Natl. Mus., no. 44, p. 208. HOLLAND, 1903, Moth book, p. 205, text fig. 115 (type), pl. 25, fig. 5. HAMPSON, 1905, Catalogue of the Lepidoptera Phalaenae in the British Museum, vol. 5, p. 363, pl. 88, fig. 17. DRAUDT, in Seitz, 1924, Macrolepidoptera of the world, vol. 7, p. 154, pl. 22a (copy of Hampson).

In the original description Grote states that the name was based on a male specimen, "No. 5999, Oregon, Coll. Mr. Hy. Edwards." Such a specimen exists in the American Museum collection; it does not bear Grote's characteristic type label but a label in Henry Edwards' handwriting, "*Perigrapha muricina* Gr." It has, however, always been considered by Smith and others as being the actual holotype, and there seems no reason to doubt this procedure, especially as Grote states in the introduction to his paper (p. 77) that "types and determined specimens are returned to Mr. Edwards," and Hampson does not list the type as being present in the British Museum collection. In the Henry Edwards' catalogue the number 5999 gives the further information that the specimen was collected at The Dalles, Oregon, by Edwards in July; the late occurrence of the species is rather odd.

The holotype is worn and possibly somewhat faded. No topotypical material has been examined, but a male in the United States National Museum, *ex* Barnes collection, from Corvallis, Oregon, April 11, matches the type very closely and can be considered as typical. After careful comparisons, it has been decided that a series from southern Vancouver Island, British Columbia, is a very close match with these Oregon males and can, without much doubt, be considered as fairly typical of the species. Male specimens are rather brighter in color than the type but show the characteristic broad, pale, marginal area on the forewings which contrasts quite strongly with the general brown color of the median area on which the pale, usually confluent spots also stand out quite sharply, forming a U mark rather less open than in *plusiiformis* forms. There is little indication of the dark basal

dash found in *plusiiformis*, but a pale spot is present below base of costa, bordered outwardly by a curved dark line and inwardly by traces of the subbasal line. Holland's text figure of the type shows such characters quite clearly, but it is doubtful if his colored figure (pl. 25, fig. 5) represents the species. It looks more like specimens that are now being placed under *coloradicola* Strand. Hampson's figure of a Vancouver male is fairly accurate but too highly and contrastingly colored. A female in the United States National Museum from Victoria, British Columbia, is very similar to the males in coloration. In another single female in the Canadian National Collection collected at Wellington, Vancouver Island, on April 29, 1907, there is a more decided purplish tinge in the ground color of the primaries, notably in the basal and terminal areas; the cross lines are more distinct and the spots are narrowly separated, this latter character being a mere individual variation, as already noted. Both sexes show considerable contrast between the brown-tinged collar and the pale gray patagia.

ANTENNAE: Only the basal half of the right antenna of the holotype was present. This has been mounted in balsam, and a drawing of the ventral side of segments 21 to 23 is given. When compared with the same section of a *plusiiformis* antenna, great similarity is apparent; slight points of differentiation are found in the somewhat greater length of the outer branch in the present species and in the points of insertion of the pectinations on the main stalk which, while not so medial as in *inferior*, are not quite so entirely apical as in *plusiiformis*. Vancouver Island males examined appear to agree in such respects, but the differences are very slight and hard to visualize in dried material.

In the female the antennae are distinctly bipectinate as in *inferior* and thus easily separable from those of *plusiiformis* and *prima*. A drawing of the ventral surface of segments 25 to 27 of the left antenna of the Wellington specimen is given. As compared with the same section of *inferior* it may be noted that the inner branch is slightly thicker and a little shorter; other differences are very slight.

MALE GENITALIA: The genitalia of the type specimen had suffered more severely from Smith's treatment than any of the other species. Only the costa and cucullus of the left clasper remained, the interior armature having been broken off. The tegumen with uncus and vinculum were intact as was the aedeagus, but none of these parts shows any appreciable difference from those

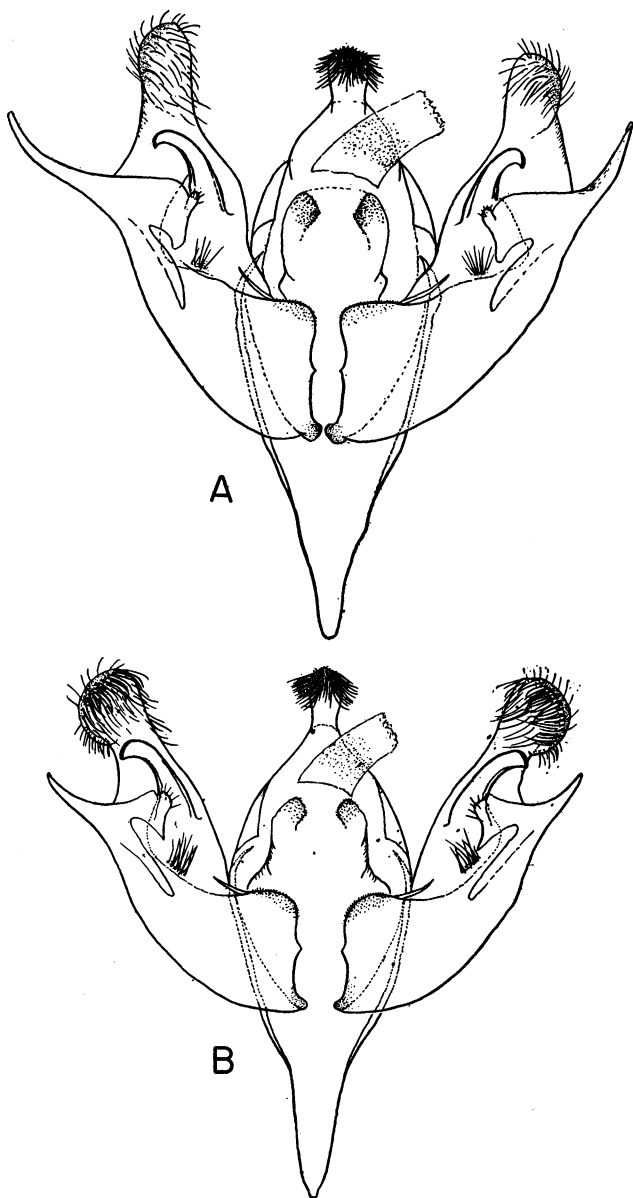


FIG. 4. A. Male genitalia of *Stretchia muricina* (Grote) (Victoria, British Columbia). B. Male genitalia of holotype of *Stretchia pacifica* McDunnough (Inverness, Marin County, California).

of *plusiiformis* as illustrated. A figure is given of the entire organ of a Victoria, British Columbia, specimen, the main differential character being found in the almost entire lack of the neck of the cucullus and the consequent slightly different position of the inner armature of the clasper. This difference seems to be borne out by the remnants of the left clasper of the type, as far as can be judged. In slide preparations that have been opened out the whole clasper also appears more upright than that of *plusiiformis* where a distinct outward bend towards apex is present.

" FEMALE GENITALIA: The general type of the genitalia is similar to that of other species. In the single slide that could be examined, and of which a figure is given, it was noted that the ductus bursae was much broader proximally than in *prima* and that the bursa membrane was strongly and closely striated, but whether or not these characters are constant can be determined only when more material is available for study.

REMARKS: As here restricted typical *muricina* would appear to inhabit the low-lying coastal areas of southern British Columbia, northern Oregon, and presumably Washington. Judging by a single male in the United States National Museum labeled "Arrowhead Lake B.C.," its range extends inland in the Canadian province for some distance, but material from this region and from other sections farther east is very scanty and identifications are still doubtful. Certain material, received mostly from the Canadian National Collection, has been tentatively placed under *muricina*, the placement being based largely on the upright characters of the claspers and the bipectinate nature of the female antennae. Two males and a female from Medicine Hat, Alberta, are rather smaller and show a deeper coloration of primaries than found in Vancouver Island specimens, the broad, pale, terminal area being restricted to a narrow subterminal band. In the male genitalia of the single specimen examined the claspers are upright, but there are evidences of a slight neck, and the corona is much heavier. The length of the lower branch of the harpe (the sacculus extension) is somewhat shorter than in the topotypical form, but this is probably individual, as a certain amount of variation has been found to exist in this respect in all the species. The female antennae possess broader, chunkier segments than in the type form, and the branches are thinner and shorter, notably those of the outer side, as may be noted from the illustration. A small female from Waterton Lakes, Alberta, may also fall

here, along with a male in the United States National Museum, *ex* Graef collection, with the possibly erroneous label "Calgary, B.C." in J. Doll's handwriting. A single male in the Sperry collection from "Wallace, Idaho" appears to agree with this latter material. Two males from Lillooet, British Columbia, are very similar to the Medicine Hat specimens but show a deeper brown median area of primaries along with a duller colored terminal section. The male genitalia differ little from those of the Medicine Hat male, the lower branch of the harpe being, however, of normal length. With these two males a single female from Moscow, Idaho, could easily be associated. There is, again, in this specimen a reduction in the length of the antennal branches as compared with those of *muricina*, but, as illustrated, the outer branch is longer than in the Medicine Hat female and almost subequal with the inner one, both being rather thick. Just what value can be assigned to these differences can be determined only when more material is available.

TYPE: Holotype, male, The Dalles, Oregon, in the collection of the American Museum of Natural History.

***Stretchia pacifica*, new species**

A small species evidently closely related to *muricina* and possibly merely a race of this species, occurring in the coastal region of central California. It is treated as a good species on account of its smaller size and certain apparently constant differences in the male genitalic and female antennal structure.

Male antennae bipectinate, closely similar to those of *muricina* but the branches possibly slightly thinner; female antennae with the outer branch shorter than that of *muricina* and both branches thinner. Squamation of palpi and head brownish, that of the head mixed with white scaling; tuft on vertex strong. Collar brown, crossed at apex by a deep brown bar. Thorax and patagia deep gray, latter with a certain admixture of white scales, and with their apices crossed by blackish bars. Primaries quite similar in general appearance to those of *muricina*, the brown tints prevailing over the wing to just beyond the t.p. line, the outer area being noticeably paler with a distinctly concave inner edge. Along the costa, as well as basad of the t.a. line and distad of the t.p. line as narrow bands, the deep purple gray ground color is predominant; the remainder of the basal area and practically the whole median area is suffused with a rather bright brown,

slightly tinged with pinkish. The basal dark half line is present, angled outward on radius; below it is a short, improminent, dark, basal dash, bordered on costal side with pale yellowish (at times obscured by brown). The brown t.a. line is obscure, feebly scalloped and outwardly oblique as in other species. The stigmata are confluent, the orbicular is prominent with its whitish filling, the reniform narrower than usual and largely filled with red brown. The U formed by the confluent stigmata is narrower and more upright than usual; it shows the white and black lower border lines common to all members of the group; the brown shading is very deep in the surrounding area. T.p. line quite improminent and mostly indicated by the dark streaks on the veins on its outer side, these, as usual, interrupted by white dots. A whitish, slightly curved band is a prominent feature of the subterminal area, bordered inwardly at apex and tornus by the customary dark brown streaks. The terminal area is somewhat darker, being shaded with purplish gray, and the dividing line between the two zones has (frequently) a somewhat dentate appearance. A series of thin black terminal lunules. Fringes with the basal half pinkish brown, the apical portion brown, checkered with blackish. Secondaries deep smoky, tinged with pinkish brown basally and with the fringes paler with a slight pinkish tinge. Beneath primaries smoky, tinged with pink in apical portion and with traces of a postmedian dark line; secondaries paler and more decidedly pink with prominent discal spots and postmedian lines. In the single female examined the brown shading of the median area is a deeper and less bright shade than in the male. Expanse 28-30 mm.

TYPE MATERIAL: Holotype, male, Inverness, Marin County, California, March 13, 1947 (W. R. Bauer), in the American Museum of Natural History. Allotype, female, same locality and collector, April 12, 1947, in same collection. Paratypes, one male, same locality and collector, March 5, 1940, and one male, San Antonio Creek, Sonoma County (Bauer), both in Canadian National Collection; one male, Inverness, Marin County, February 16, 1948, and one male, Bodega, Sonoma County, March 18, 1939, both in collection of W. Bauer; one male, Spring Mountain, Sonoma County, March 5, 1940, in collection of O. Buchholz; one male, Bodega, Sonoma County, March 18, 1939 (E. C. Johnston), in United States National Museum.

REMARKS: The male genitalia, as illustrated, are intermediate

between those of *muricina* and *plusiiformis* and show the usual variation, common to the group, in the length of the lower branch of the harpe and the shape of the cucullus; the whole organ is smaller than in either of the other species. The female genitalia approach closer to those of *prima*, as illustrated, than they do to *muricina*; the ductus bursae is even narrower and less expanded proximally than in *prima*, and the bursa shows little of the striations found in *muricina*.

The species would appear to be subject to considerable variation. A slight tendency towards a brownish suffusion in the pale terminal areas in otherwise normal specimens is evident in some of the paratypes. In two males under examination this suffusion has been developed to such an extent as entirely to eliminate the pale areas, and in one of these males smoky shade bands cross the primaries in the antemedian and subterminal areas. In both specimens the confluent stigmata are heavily overclouded. In a third male from Bodega, Sonoma County (in the Canadian National Collection), which on genitalic characters belongs here, the whole of the primaries are deep smoky with nearly all trace of the maculation obliterated. This specimen has the superficial appearance of *inferior*.

