

NOTES ON GEOMETRIDAE NEW TO BRITISH COLUMBIA

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This is the fourth year in succession that I have presented you with a paper under a similar title. Each year I am in hopes that I have come to the end of the new additions to the list, but after another season's work, I always seem to find some species and varieties that have not been previously recorded.

The present paper embraces two species and eight varieties new to science that have been described during the past twelve months, and four species and three varieties new to British Columbia, making a total of six species and eleven varieties to be added to the list as a result of last year's investigations.

I will take the new species and varieties first.

Nomenia obsoleta Swett. When rearranging the collection of the late Captain R. V. Harvey, I came across three specimens that were labelled **Venusia cambrica** Curtis. Although bearing a strong superficial resemblance to this species they seemed rather small, and on further examination I found that they were all taken in April. Now as **cambrica** does not emerge until about the first of July, I knew at once that it could not be that species. Upon further examination under a microscope I found that in the males the antennae were somewhat different, being unipectinate, while in **cambrica** they are bipectinate and in **pearsalli** filiform ciliate. As they evidently did not belong to either of these two genera, they naturally fell into the genus **Nomenia**, which is closely allied. As we had no representative of this genus in British Columbia, I concluded that it was new and sent it to Mr. L. W. Swett, who verified my conclusions and named it **obsoleta**. This name is rather appropriate, as I have not seen it anywhere else with the exception of one in the Provincial Museum, which was taken in the same month and year—April, 1908.

I have worked this district thoroughly for the past five seasons, but have not taken anything approaching it, so that I am afraid it has disappeared.

Diastictis andersoni Swett. This species was taken by Mr. E. M. Anderson at Atlin, B.C., in 1914, and was at first thought to be a luteous form of **occiduaris** Pack., but the extra-discal lines are differently curved and there is no trace of any yellow shading. It is closely allied to **inceptaria** Walk., specimens of which I have from Michigan.

Hydriomena californiata ab **niveifascia** Swett. In Capt. Harvey's collection there were several specimens of **Hydriomena** under the name of **californiata**. On looking them over, I found two which were quite distinctive from the others, and which have been named as above. The chief points of distinction are the silvery white bands which replace the ordinary red shadings and smoky bands of the typical form.

PLATE II.



- Fig. 5. *Xanthorhoe defensaria* form *gigantaria* Swett. (Paratype male).
Fig. 6. *Xanthorhoe defensaria* form *gigantaria* Swett. (Allotype female).
Fig. 7. *Xanthorhoe defensaria* form *conciliaria* Swett. (Paratype male).
Fig. 8. *Xanthorhoe defensaria* form *conciliaria* Swett. (Allotype female).
Fig. 9. *Xanthorhoe defensaria* form *thanataria* Swett. (Paratype male).
Fig. 10. *Xanthorhoe defensaria* form *thanataria* Swett. (Paratype female).
Fig. 11. *Xanthorhoe defensaria* form *mephistaria* Swett. (Paratype male).
Fig. 12. *Xanthorhoe defensaria* form *suppuraria* Swett. (Paratype male).

The above three insects were described in the Can. Ent., Vol. XLVIII., page 249 et seq. (July, 1916).

The next in order is the genus **Xanthorhoe**, a genus we have been working on for some considerable time. When I started to collect geometers seriously in the spring of 1912, I was much struck with the amount of variation that occurred in three species of this difficult but interesting genus. I determined to pay special attention to this group, with the result that in 1913 and 1914 I collected something over 300 specimens of this genus. The three groups mentioned are the **defensaria** group and what are known as the **fossaria-pontiaria** group and the **munitata-convallaria** group.

Taking the **defensaria** group first, I sorted them out into series governed by the date of their appearance and the differences in maculation. I then sent them to Mr. Swett, who agreed in the main with my separation, with the result that the following four well-marked varieties were described by him in the Can. Ent., Vol. XLVIII., page 349 et seq. (October, 1916).

X. defensaria var. **gigantaria** Swett, which is the large spring form occurring at the end of April. It is distinguished by its large size, heavy markings, and wide bands.

X. defensaria var. **conciliaria** Swett. This is a very distinct form and is easily recognized by the basal and outer areas of the fore wings being a deep ochre and the median band of a reddish chocolate colour. It flies along with, and at the same time as, typical **defensaria**.

X. defensaria var. **thanataria** Swett. This is a small and stunted form which occurs later in the fall, generally in September and October. It is possibly a third brood, but this cannot be definitely stated until it is bred. In fact, the whole of this group may have to be revised again, when the life histories of the various forms are worked out and the genitalia studied.

X. defensaria var. **suppuraria** Swett. This is a beautiful variety and a very distinct one, the broad black band contrasting sharply with the lighten ashen colour of the fore wings. This median band is subject to a variation in colour from reddish black to a deep jet black, and is really a melanistic form. This is the rarest of all the varieties and occurs in April.

I may say here that the study of the **fossaria-pontiaria** group has just been completed and three new species have been discovered, which will be described in the Can. Ent. at an early date. This leaves us the **munitata-convallaria** group to work on during the present year, and which we hope to complete before our next annual meeting.

We now come to the **Dystroma citrata-mulleolata** group. **Citrata** Linn and its varieties I treated of in our Proceedings No. 4, N.S., page 44 et seq., 1914, and **mulleolata** I spoke of in the paper I read before you

at our last annual meeting. A more complete revision of this group has just been given by Mr. Swett in the *Can. Ent.*, Vol. XLIX., page 64 et seq. (February, 1917), wherein he has described the three following new aberrations:

Dysstroma mulleolata ab **sobria** Swett. This is a form which has the median band solid black and is the rarest form of all. So far I have only taken one specimen and that is the type which is in the collection of Mr. Swett.

D. mulleolata ab **subumbrata** Swett. In this form, which is a transition stage between the black-banded and the white-banded forms, the black central band has begun to break up into greyish spots and shadings, especially at the costal and inner margins. Of this form I took four specimens in 1914 and two in 1915, but have not seen it since.

D. mulleolata ab **ochrofuscaria** Swett. Of this form I have only taken one, and that is the type taken on the 27th June, 1915. Mr. G. O. Day took a female at Quamichan Lake in 1908, which has been made a paratype, as also is a male taken by Mr. A. W. Hanham in the same district in 1910. I believe Mr. Hanham has also one or two more of them.

I am not quite so sure of this latter being a variety of **mulleolata**. The course of the extra-discal line is different, and there are one or two other minor points which make me think that it may be a distinct species when its life history is worked out together with a study of the genitalia.

This concludes the list of species and varieties new to science which have been described from British Columbia during the past twelve months. Turning to those geometers which I have discovered during the past year as being new to British Columbia, the first to claim our attention is **Hydriomenia furcata** var. **periclata** Swett. I found this interesting geometer resting on the outside of my house on April 4th, 1916. It was described from a single male taken at San Francisco in 1909, and seems to be of very rare occurrence.

Stamnodes topazata var. **albida** B. & McD. where the deep ochereous colour of **topazata** gives place to a creamy white. This specimen was taken by our energetic librarian, Mr. Williams Hugh, and is rather illustrative of what is generally known as fisherman's luck. Mr. Hugh was over in Abbotsford for a few days in the early part of April last year, and one day seeing a few geometers flying about, he caught half a dozen with his hat, and brought them back with him in a matchbox.

Five of them were the common **M. gratulata**, and the other a new addition to the list. I am only sorry that the numbers were not reversed. Our thanks are due to Mr. Hugh for putting a new record on our lists in such a lucky manner.

Sciagraphia orillata Walk., taken by Mr. Anderson at Penticton on May, 1913. This was placed as a synonym of **continuata** Wlk. by Dr.

Dyar in 1902, but is a distinct species, a very excellent figure of which is given in Packard's Monograph, Plate IX., Fig. 75.

Sciagraphia meadiaria Pack., taken by Mr. W. Newcomb at Chilcotin in June, 1914. This one was rather damaged, but we are glad to have the record of it. This group sadly needs revising, but unfortunately our material in this group is very limited.

Macaria praeatomata Haw. This pretty species was taken by Mr. Downes at Armstrong in 1915. It is accurately figured by Packard in his Monograph on Plate X., Fig. 18. The name will probably fall before **bicolorata** Fab., as I believe the two species are the same. Packard had never seen a specimen of **bicolorata**, which was described from Virginia in 1794. **Praeatomata**, while not common, is widely distributed throughout the New England States.

Diastictis decorata Hulst. A specimen of this species was taken by Mr. Anderson at Lillooet in July, 1916. This species was described from specimens taken by Dr. Barnes at Platte Canyon, Colorado, in 1896.

Alcis sulphuraria var. **baltearia** Hulst. This pretty variety was taken by Mr. Downes in June, 1915, and also by Mr. Anderson at Lillooet, 27th June, 1916. I have specimens exactly like this one, taken at San Diego, Cal., in July.

This concludes the list of those that we are absolutely certain of as being new to British Columbia, although there are a few more yet to be correctly placed. We seem to have quite a number of intermediate forms in this Province, perhaps it would be better to say local races, and until these are bred and their life histories worked out, it cannot be definitely ascertained what their relationships are to closely allied species, appearing in other parts of the country.

Author's Note (July, 1918).—Since the above paper was written, many new facts have come to hand which makes it necessary to add the following notes and remarks:

Nomenia obsoleta Swett. On looking over the collection of Mr. G. O. Day, of Duncan, in September, 1917, I found that he had four specimens of this species amongst his material, all taken in the Duncan district. Showing how rare this species is, not more than one specimen was taken in any one year, the dates of capture being March 20th, 1914; April 16th, 1915; May 7th, 1916; and April 3rd, 1917. I was extremely glad to get these records, as I had feared that the species was extinct.

Xanthorhoe defensaria form **thanataria** Swett, and **Xanthorhoe defensaria** form **suppuraria** Swett. These two forms have both been placed in the synonymy by Messrs. Barnes and McDunnough in their New Check List. In the case of **thanataria** they are probably correct, as in my opinion it is only a partial third brood which is produced in those seasons having a long, dry fall. The food plant at that time of the year being much less succulent, thus producing a small stunted form

with narrower bands. As regards *suppuraria* I must entirely disagree with them in placing it as a synonym of *mephistaria* Swett. They are seasonal forms, are quite distinct both in size and width of median bands, and I have never known them to intergrade. In my opinion *suppuraria* bears the same relation to *mephistaria* that *gigantaria* bears to typical *defensaria*.

Hydriemena furcata var. *periclata* Swett. There is some doubt as to the status of this specimen, either Mr. Swett has misidentified it, or the reference to *furcata* is incorrect. At the time I took the specimen in question I recognized that it was different to any that I had taken previously. I read over carefully the published descriptions of this group, and it seemed to me that it agreed very closely with *periclata*. At a later date I sent it to Mr. Swett, who confirmed my identification, remarking that "it is very nearly like type." Messrs. Barnes and McDunnough in "A Review of the genus *Hydriemena* Hub." (Cont. Lep. No. Amer., Vol. IV., No. 1), state that Mr. Swett has examined the unique male type (of *periclata*) and informs them that unfortunately the uncus is broken off but that the basal portion is rather narrow and suggests that of *furcata*. Recently I have examined my specimen under a binocular, and find that the uncus is of the shape which is characteristic of the *quinquefasciata* group, and which materially differs from the shape of the uncus in the *furcata* group. Until such times as further nimitypical specimens of *periclata* can be obtained, the reference to *furcata* cannot be considered as entirely conclusive. For the present I shall list it with a question mark as follows: *H. furcata* (?) var. *periclata* Swett.

Hydriemena californiata var. *niveifascia* Swett. Messrs. Barnes and McDunnough have associated this form with *irata* Swett, instead of *californiata* Pack., on account of the similarity of the male genitalia which differs considerably in the two species named. This variety is now known as *H. irata* form *niveifascia* Swett.

Dysstroma mulleolata Hulst. It is rather doubtful if our large Vancouver Island form is the true *mulleolata*. The type locality in Hulst's description is given as Colorado, whilst the type specimen in the Hulst collection at Rutgers' College, N.J., is labelled "Washington," so it is questionable whether this so-called "type" represents the true *mulleolata* of Hulst. Again, Mr. Weiss who compared a specimen of the large Vancouver Island form with this so-called "type" (which is in very poor condition), may have misidentified it, as this large form, typical *truncata* Huf., and *citrata* form *punctum-notata* Haw. are practically alike in maculation. It is more than likely that the Hulst specimen, if the locality label is correct, is really conspecific with the latter-named form.

I wish to thank Mr. F. Kermode, our Honorary President and Director of the Provincial Museum, for the loan of the cuts, from which Plates II. and III. were made to illustrate this paper. E. H. B.

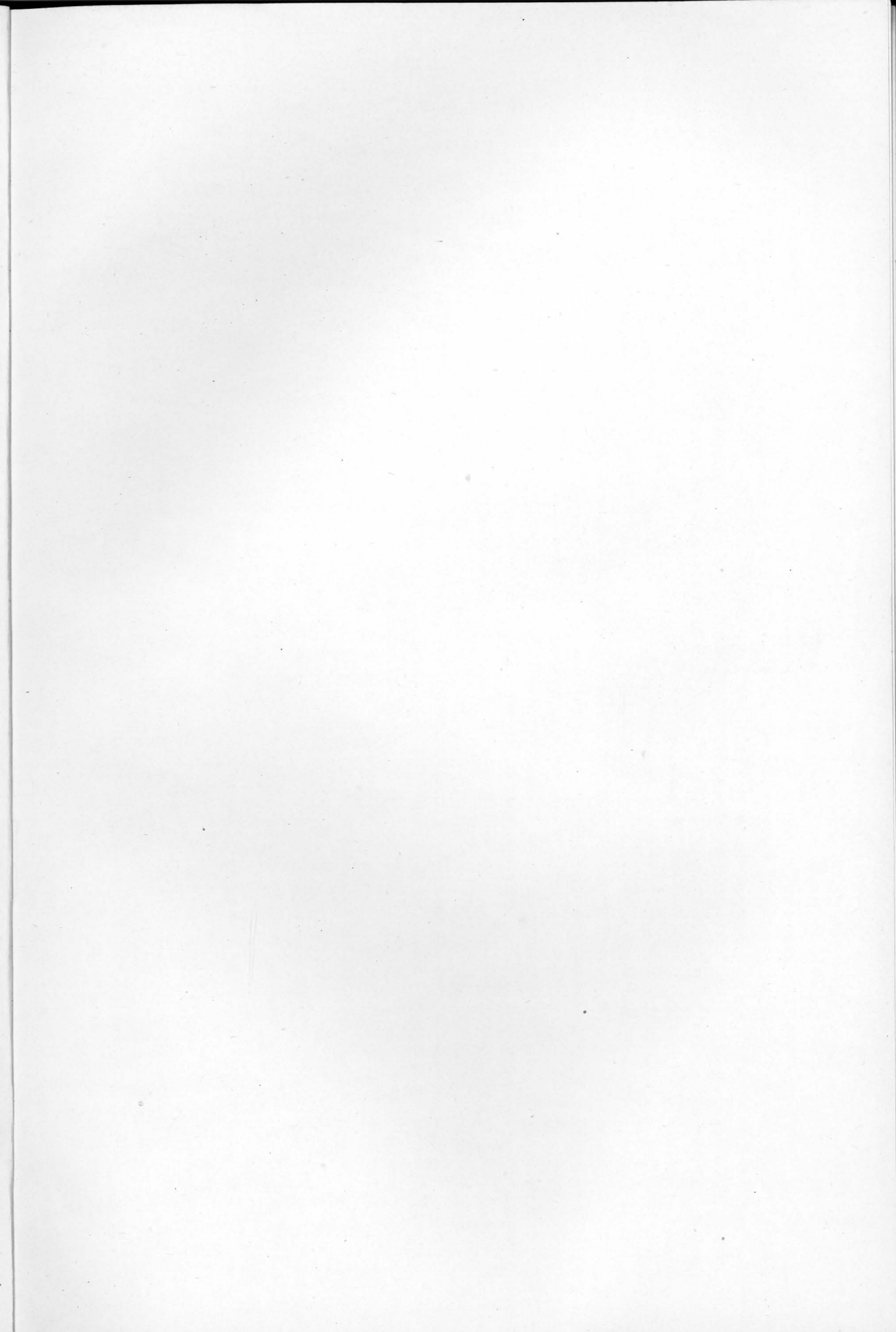


PLATE III.

Dysstroma mulleolata Hulst.
Victoria, B.C. (Blackmore)
(New to British Columbia.)

Dysstroma mulleolata form *subumbrata* Swett.
Victoria, B.C. (Blackmore)
(New to science.)

Dysstroma mulleolata form *ochrofuscaria* Swett.
Victoria, B.C. (Blackmore)
(New to science.)

Hesperumia sulphuraria form *baltearia* Hulst.
Armstrong, B.C. (Downes).
(New to British Columbia.)

Hydriomena furcata race *periclata* Swett.
Victoria, B.C. (Blackmore)
(New to British Columbia.)

Hydriomena irata form *niveifascia* Swett.
Victoria, B.C. (Harvey coll.).
(New to science.)

Venusia obsoleta Swett.
Goldstream, B.C. (Harvey coll.).
(New to science.)

Itame andersoni Swett.
Atlin, B.C. (Anderson).
(New to science.)

PLATE III.

