

*METANEMA BRUNNEILINEARIA* GROSSBECK MISPLACED IN *SYNTAXIS* HULST  
(GEOMETRIDAE: ENNOMINAE)

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**ABSTRACT.** Based upon genitalic characters, the ennominine geometrid species *brunneilinearica* is removed from genus *Synaxis* and returned to *Metanema*. The male genitalia of typical species of *Synaxis* and *Metanema* are illustrated. The female holotype, a typical male and female adult, and the male and female genitalia of *Metanema brunneilinearica* are illustrated.

**Additional key words:** California, *Metanema determinata*, *Metanema inatomaria*, Nevada, taxonomy.

In conjunction with an ongoing revision of the genus *Synaxis* Hulst (*sensu stricto*), I have been examining type material and making genitalic dissections of typical specimens. The male genitalia of the taxon *brunneilinearica* Grossbeck are very different from those found in *Synaxis*, and on this basis I am returning this species to *Metanema* Guenée, in which it was originally described. As shown in the accompanying figures, the male genitalia of *Synaxis* manifest a single robust tubular furca originating from the midline of the juxta plate, the apex of which may be blunt (Fig. 1) or taper to a point (Fig. 2), depending upon species. The gnathos has a quadrate dorso-caudal margin with one or more pairs of slender tapered spinose projections (in some individual specimens there are multiple asymmetric projections). McGuffin (1987) discussed the generic characters of *Metanema* and illustrated the adults and male and female genitalia of *M. determinata* Walker and *inatomaria* Guenée. The furca in *Metanema* is double consisting of two slender projections that arise from either side of the juxta plate as shown in Figs. 3 (*inatomaria*) and 8–9 (*brunneilinearica*). The gnathos tapers to a point. There are two prominent coremata, which are absent in *Synaxis*. McGuffin characterized the female genitalia of *Metanema* as having a narrow ductus bursae, elongate corpus bursae with one signum, and a posterior-to-anterior apophyses length ratio of approximately 2:1.

Ptikin (2002, p. 324) provided only a brief mention of *Metanema*, citing all of the species to be Nearctic and outside of the geographic scope of her study. Scoble (1999) implied that additional species study is required and placed entries under *Metanema* and "*Metanema*".

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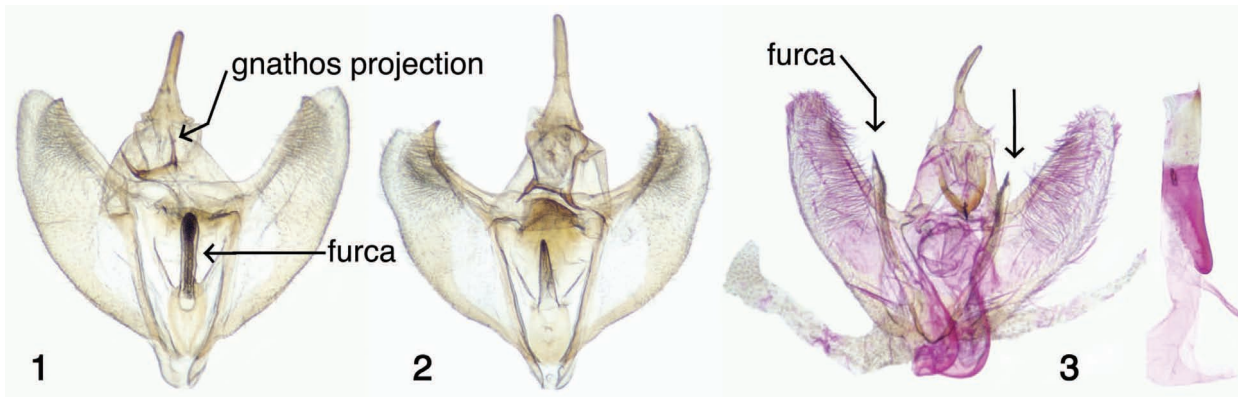
*Metanema brunneilinearica* Grossbeck  
new combination

*Metanema brunneilinearica* Grossbeck, 1907; TL Verdi [Washoe Co.], Nevada; female HT in AMNH (Figs. 4–5). The holotype label (Fig. 5) shows the species name "brunneilineata," but the name as published in the original description is *brunneilinearica*.  
*Synaxis brunneilinearica*; McDunnough, 1938  
*Synaxis brunneilinearica*; Scoble, 1999

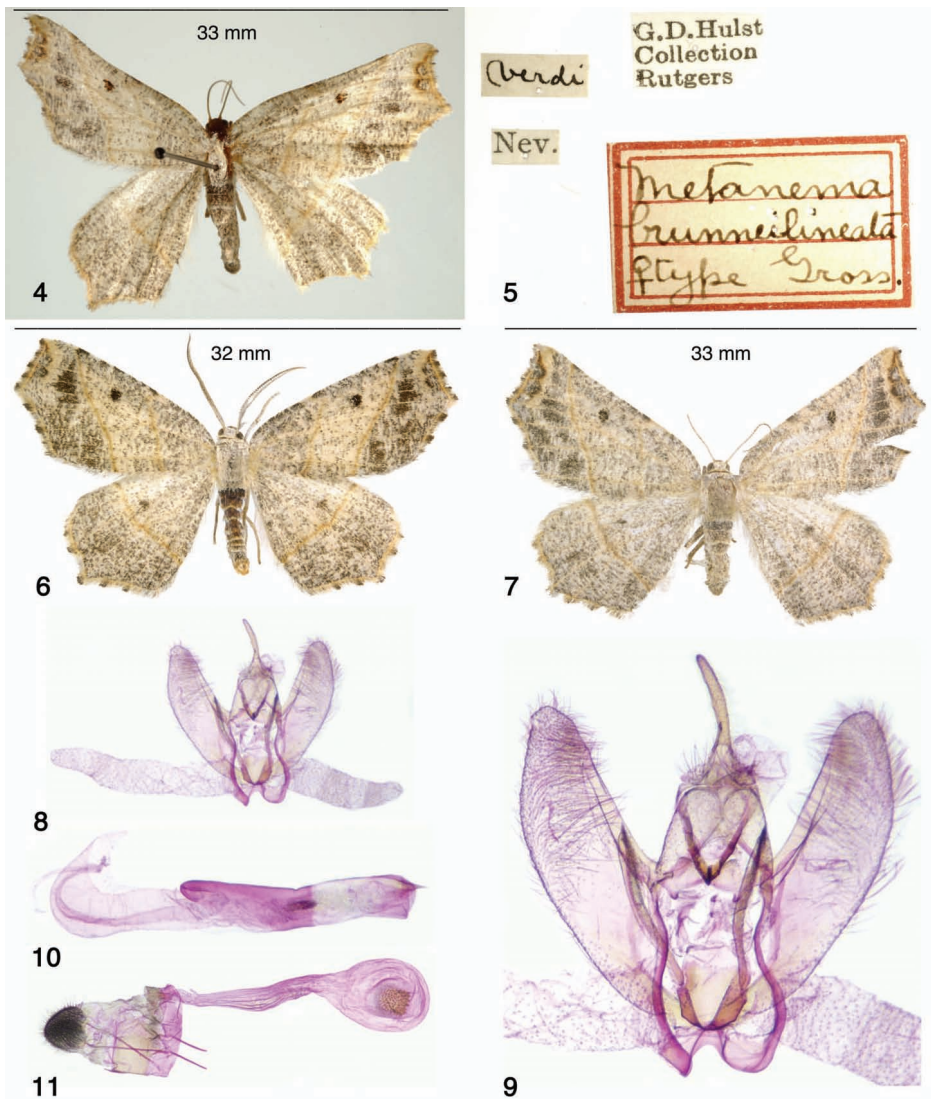
**Material examined** (5 males, 5 females; 1 male, 1 female, dissected): CALIFORNIA. Alpine Co., 1 mi. E. of Monitor Pass, 1.viii.1992 (1 female), R. M. & S. A. Brown; El Dorado Co., 2 mi. E. Silver Lake, 9.vii.88 (1 male), J. A. Smith; Mono Co., hwy. 395 W. Mono Lake, 19-30.vi.1986 (3 males, 1 female) A. H. Porter; Plumas Co., Johnsville, 16.vii.1968 (1 female), 18.vii.1969 (1 female), H. Pini; no locality, 25.vii.1936, (1 male), M. Walton. NEVADA. [Washoe Co.], female HT by photograph.

**Discussion.** Grossbeck (1907) provided a detailed description of the color and maculation of this species, and adults are adequately shown in Figs. 4, 6–7. The sexes are similar in size and the male antennae are bipectinate, as in the two other North American species, *M. determinata* and *inatomaria*. The forewing shape of *brunneilinearica* is consistent with those species. The outer margin is prominently produced at vein  $M_3$  in the forewing, and crenulate in the hindwing. The wing ground color is pale yellowish-white, but appears pale gray because of peppering by black scales. Both wings have prominent dark discal spots. The distal quarter of the forewing displays irregular patches of black scales divided by a subterminal pale band that parallels the contour of the outer margin. There are faint orange-brown am and pm lines on the dorsal forewing, and a postdiscal line on the dorsal hindwing. Figs. 8–11 illustrate the male and female genitalia, both of which are nearly identical to those of *M. inatomaria*.

It has been suggested that *M. brunneilinearica* and *M. inatomaria* might be conspecific, with *brunneilinearica* simply a western form of the latter. While the male



FIGS. 1-3. Figs. 1-2. Male genitalia (aedeagus removed) of *Synaxis* species: **1**, *jubararia* (Hulst); **2**, *barnesii* (Hulst). Fig. **3**. Male genitalia of *Metanema inatomaria* with aedeagus removed and shown at right.



FIGS. 4-11. Figs. 4-5. Female holotype of *Metanema brunneilinearia*: **4**, holotype; **5**, pin labels (AMNH photos). Figs. 6-7. *Metanema brunneilinearia* adults: **6**, male, CA, Mono Co.; **7**, female, CA, Alpine Co. Figs. 8-10. *Metanema brunneilinearia* male genitalia: **8**, genitalia showing full extent of coremata with aedeagus removed; **9**, genitalia, aedeagus removed; **10**, aedeagus. Fig. **11**. *Metanema brunneilinearia* female genitalia.

genitalia of the two entities are very similar, the color and maculation of the adults are quite different. On this basis, I don't feel it appropriate to make the synonymy. DNA analysis (barcoding) could resolve this issue, but that is beyond the intent and scope of this article, which is simply to return *brunneilinearis* to the genus where it belongs.

The biology of *M. brunneilinearis* is unknown. Based upon available records, adults fly from mid-June into early August. The geographic distribution includes Washoe Co., NV and several counties in California north and south of Lake Tahoe along the border with Nevada.

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