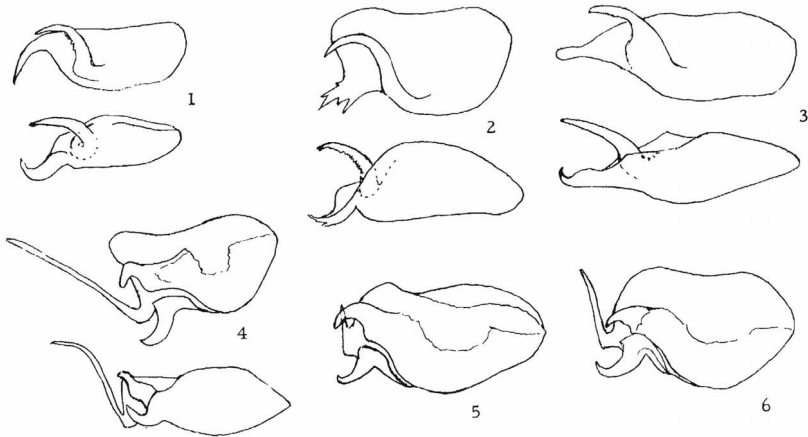


A NEW GEOGRAPHICAL SUBSPECIES OF *CHLOSYNE*
HOFFMANNI (NYMPHALIDÆ) FROM WASHINGTON STATE

by DAVID L. BAUER

Chlosyne hoffmanni (Behr) is a new combination of generic and trivial names. It is fully warranted by the structure of both the male and the female genitalia of *hoffmanni*. These are of the same character as those of *janais* Drury, the type species of the genus *Chlosyne* Butler. They only distantly resemble the genitalia of either *cinxia* Linné, type species of the genus *Melitæa* Fabricius, see Higgins (1941: p.195), or of *athalia* Rottemburg, the type species of *Mellicta* Billberg, see Higgins (1955: p.4). There is a series of genera that range from *Euphydryas* Scudder to *Gnathotriche* Felder in which *Chlosyne*, *Mellicta*, and *Melitæa* are about midway between the extremes. Both *Mellicta* and *Melitæa* are closer to *Phyciodes* Hübner than *Chlosyne* is when judged by the genital structures of the type species. The *Chlosyne* are distinctive and stand closer to *Microtia* Bates and *Euphydryas*. Unfortunately no linear arrangement can show all the interrelationships shown by these genitalic structures. The whole series from *Euphydryas* to *Gnathotriche* could be united as a single polytypic genus, *Melitæa*, which would necessitate many subgenera, or, as seems more suitable to me, could be divided into several related genera based on genitalia, life history, and distribution.

The male valves of the type species of *Chlosyne*, *Mellicta*, and *Melitæa*, and of *Phyciodes mylitta* are shown in figures 1-4. The valve of *Chlosyne* is very close to that of *elva* Bates, the type species of the genus *Microtia* Bates. But the female genital structures are very different (Bauer, 1958: p. 97).



Male Valvæ: fig.1—*Melitæa cinxia* (L.); fig.2—*Mellicta athalia* (Rott.); fig.3—*Phyciodes mylitta* (Edw.); fig.4—*Chlosyne janais* (Drury); fig.5—*C. hoffmanni*; fig.6—*C. palla*. Lower drawing of figs.1-4 shows external view; other six show internal view.

I have seen specimens of Washington *Chlosyne hoffmanni* in various collections labeled *Melitaea hoffmanni segregata* Barnes & McDunnough, *M. palla* Boisduval, and *M. palla whitneyi* Behr. This confusion is the natural result of trying to place taxonomically an insect which does resemble these named varieties, but is not exactly like any one of them. This troublesome insect is found along the east slope of the Cascade Mountains in Washington state from Mount Adams north to the Canadian line. It probably occurs in British Columbia, but as yet I have seen no specimens from that province. It is found from elevations of around 5,000 ft. along the crest of the Cascades to as low as 1,500 ft. in several of the deep canyons. As would be expected with such an altitudinal variation there is a cline from brighter ground and reduced dark markings at lower elevations to contrasting ground coloring and heavy dark maculation at high altitudes. All of the specimens, regardless of the locality, bear the same distinguishing characteristics noted in the description that follows.

Chlosyne hoffmanni manchada Bauer, NEW SUBSPECIES

HOLOTYPE male: upper surface of the primaries bears the general pattern of the species in the *palla* group; the wide ruddy-orange marginal band is crossed by very weakly developed dark scaling on the veins; the submarginal ruddy-orange band is broken into a series of spots extending from the costa to the inner margin; these spots are largest in the central portion of the band; all these spots are heavily margined basad with dark scaling, which on some specimens reduces each spot to a mere dot; the next band is ruddy-orange and extends across the wing from the costa to the inner margin and is divided into quadrate spots by dark scaling along the veins; the amount of dark scaling along the veins varies from very heavy to almost obsolete; this series of quadrate spots is pupiled with dots of paler orange; the innermost band is slightly paler than the others and is divided into spots by either ruddy-orange or dark brown scaling along the veins; the basal third of the wings is marked as in *C. hoffmanni hoffmanni*, but the orange is ruddier, and there is a paler orange bar across the middle of the cell.

The under surface of the primaries is marked more like that of *C. calydon* (Mead) than either *C. h. hoffmanni* or *C. hoffmanni segregata* (Barnes & McDunnough).

The upper surface of the secondaries bears the maculation typical of the *palla* group; the broad ruddy marginal band is crossed by dark scaling along the veins and is heavily bordered basad with dark scaling; the submarginal series of ruddy-orange spots extends from the costa to the anal angle, and is heavily outlined with dark scaling; the third ("middle row" of Barnes & McDunnough, 1918) is the broadest, and is slightly darker ruddy-orange than the others; this third row is obsolete on the costa. The fourth, or innermost, spot band is the narrowest and is pale orange-fulvous in color; it tends to be obsolescent from the end of the cell to the inner margin; the remainder of the wing is as in *C. hoffmanni hoffmanni*.

The color and maculation of the under surface of the secondaries is similar to that of *C. p. palla* (Boisduval) and *C. p. whitneyi* (Behr). The maculation is not distinctive.

Fringes: mostly black with some white between the ends of the veins on the fore wings, while on the secondaries there is about an even amount of black at ends of veins and white between them.

Palpus: heavily clothed with hairs; the terminal half is ruddy-orange-brown shading gradually to white basally. The long hairs on dorsal and ventral surfaces dusky.

Antenna: predominantly ruddy-orange-brown ventrally; the color is paler at the base and deeper on the club; dorsally each segment is flecked with black and strongly marked with white at the juncture of the segments; the club is ruddy-orange-brown and flecked with white dorsally.

Head: black heavily flecked with ruddy-orange-brown dorsally; ventrally it is also flecked with creamy-white.

Thorax: black thinly covered with brownish hairs dorsally; the lappets, or tegulae, are very hairy; the hairs are dark brown tipped with ruddy-orange-brown; ventrally the thorax is very heavily clothed with long creamy-white hairs.

Legs: predominantly ruddy-orange-brown, but the inner surface of the femur is scaled with white; there is a little black scaling on the coxa.

Abdomen: black dorsally; it is clothed with long brownish hairs anteriorly. There is some creamy scaling at juncture of the segments; the terminal brush of hairs, which hides the genital armature, is pale orange brown; ventrally the coloring is creamy-white with two broken longitudinal black lines.

ALLOTYPE female: almost identical with the male holotype; the description of the holotype will suffice, as the only real differences in appearance are a greater contrast in the ruddy-orange and paler orange coloring.

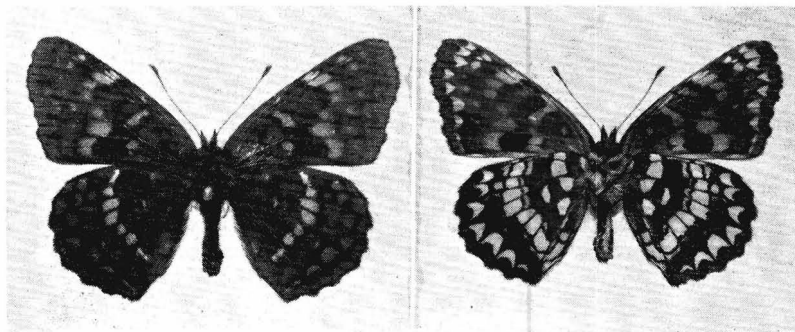


Fig. 7 — ♂ paratype from Tumwater Canyon, Wash., 12 June 1951, in Yale Peabody Museum; upperside left, underside right.

HOLOTYPE male: 1,600 feet elevation in Tumwater Canyon, Drury, Chelan Co., Washington, 23 June 1954, *leg.* DAVID L. BAUER. Expanse of forewings 37.5 mm. Length of forewing base to apex 20 mm. Length of hindwing base to outer margin 15 mm.

ALLOTYPE female: 1,600 feet elevation Tumwater Canyon, Drury, Chelan Co., Washington, 16 June 1958, *leg.* DAVID L. BAUER. Expanse of forewings 40 mm. Length of forewing base to apex 21 mm. Length of hindwing base to outer margin 16 mm.

PARATYPES as follows, all from Chelan Co., Washington: 11 ♂♂ same data as Holotype; 6 ♂♂ same data as Allotype; 6 ♂♂ 1,700 feet elev. Tumwater Recreation Area, 12 June 1951, *leg.* DONALD P. FRECHIN; 1 ♂ 1,800 feet elev., Icicle Creek Canyon, 21 June 1955, *leg.* DAVID L. BAUER; 1 ♂ 2,000 feet elev. upper Mission Creek, 30 May 1956, *leg.* DAVID L. BAUER; 1 ♂ 1,500 feet elev. near Leavenworth, 4 June 1958, *leg.* DAVID L. BAUER; 5 ♂♂ 2,500 feet elev. near Gaynor, 4 June 1958, *leg.* DAVID L. BAUER.

The Holotype and Allotype are deposited in the Los Angeles County Museum, Los Angeles, California, one paratype in the American Museum of Natural History, New York, N. Y., and one paratype in the Peabody Museum, Yale University, New Haven, Connecticut.

The insect has also been collected and the specimens examined, from the following localities outside of Chelan County: Bird Lake, Mt. Adams, Yakima Co., 6-7 August 1953, *leg.* S. G. JEWETT JR.; Bear Creek, Yakima Co., 28 May 1958, *leg.* E. J. NEWCOMER; Sheep Lake, 5,500 feet elev., Yakima Co., 11 July 1958, *leg.* E. J. NEWCOMER; near Camp Gilbert, 2,700 feet elev., Okanogan Co., 10 June 1956, 3 July 1953, and 12 July 1955, *leg.* JOHN C. HOPFINGER. These are not made paratypes.

DISCUSSION

The type series of *C. h. manchada* has been compared carefully with the original description of *C. h. segregata* Barnes & McDunnough (1918) and the figures given of the type; the two paratypes figured by HOLLAND (1931) plate LVII: figs.28, 29; and a short series of topotypes. It has also been compared with series of specimens from other areas of Oregon: — the Deschutes National Forest, Suttle Lake, and Mt. Hood. It was found to be separable from all these Oregon specimens by means of one of BARNES and McDUNNOUGH's key characters for *segregata*, which is stated in the original description as follows: "on the secondaries the middle row of the three extra discal rows tends toward obsolescence." In typical *manchada* this "middle row" is the broadest, and most prominent, persistent, and bright ruddy-orange-brown; while the rows on either side of it are the ones which tend toward obsolescence.

Like *segregata* it can readily be separated from typical *hoffmanni* from California by the much narrower innermost spot band of the secondaries, and by its checkered and spotted appearance.

When females are caught with the males, the dimorphic females of *palla* and its northwestern race *sterope* enable easy recognition and separation of *hoffmanni* and its geographical subspecies. But if one is to distinguish accurately between specimens of the nondimorphic *whitneyi* and *hoffmanni*, particularly the northwestern *hoffmanni manchada*, or if only males are available from a population, the male genitalia should be checked. Positive specific identification can be made because of the differences in the structure of the posterior process of the valva, see figures 5 and 6. The form of this posterior projection is unique to *hoffmanni* in the *palla* group, but is very similar to that of the eastern *C. gorgone* Hübner; however, these two species are so different in wing maculation there need be no confusion.

The foregoing information should help in the identification of the species of the *palla* group not only in the Pacific Northwest, but also throughout the Cascade-Sierra mountain chain. The chief confusion has involved *C. palla whitneyi* and *C. hoffmanni manchada*, but the paler form of *whitneyi* which

flies along the east slope of the Cascade Mountains from British Columbia to Oregon has also been confused with *C. acastus*. WRIGHT (1905) figures this form as *acastus*. His locality, Pasco, Washington, is questionable, but the month, July, is correct. Genuine *acastus* flies during May in the Steens Mountains of southeastern Oregon.

CONCLUSION

The Columbia River gorge is a barrier to the southward spread of the butterflies *Erebia vidleri* Elwes and *Boloria chariclea* Schneider into Oregon, as they are not found in that state. *Chlosyne hoffmanni* has crossed this barrier, but the subsequent isolation has resulted in the development of the distinctive Washington population named in this paper. We can thus recognize three geographical populations of the species as follows:

Chlosyne h. hoffmanni (Behr) — Sierra Nevada Mts., California.

Chlosyne hoffmanni segregata (B. & McD.) — Cascade Mts., Oregon.

Chlosyne hoffmanni manchada Bauer — Cascade Mts., Washington.

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