EARLY STAGES OF *CHLOSYNE HOFFMANNI MANCHADA* (NYMPHALIDAE)

E. J. NEWCOMER
1509 Summitview, Yakima, Washington

Chlosyne hoffmanni manchada was described by Bauer (1959) from Chelan County, Washington. He also reported specimens from Okanogan County, north of Chelan County, and from Yakima County, to the south. This subspecies may also occur in Kittitas County, which is between Chelan and Yakima counties, and possibly in Klickitat County, south of Yakima County. Bauer also states that *manchada* may occur in British Columbia.

C. h. manchada is very common in Bear Canyon, about 25 miles west of Yakima (Newcomer, 1964). This colony has afforded the author a good opportunity to identify the foodplant. Apparently nothing has been published on the foodplants of *hoffmanni* or its subspecies, but related species are known to feed on *Castilleja* and *Aster*. Since the eggs are deposited in masses, oviposition by a female probably occurs but once or twice, and attempts to follow flower-visiting females to the foodplant failed. Eggs were obtained from captive females in 1962 and 1963, but the resulting larvae would not feed on *Castilleja* and only sparingly on China aster (*Callistophus chinensis* Nees, closely allied to *Aster*) and on michaelmas daisy (*Aster novae-angliae* L.).

Finally, in late summer of 1964, *Aster conspicuus* Lindley was discovered in Bear Canyon. This is a large plant growing to a height of 30–60 cm with leaves often 15 cm long. It usually occurs in light shade under pine trees, where it may bloom very sparingly. For this reason I had overlooked it. Examination of two large clumps of this aster late in July revealed small, spiny caterpillars feeding gregariously on the foliage. These proved to be larvae of *C. h. manchada.* Most were in the second and third instars. They had spun some webbing over the leaves and were feeding underneath the web in groups, side by side, advancing across the leaf and skeletonizing it. Many leaves had been completely skeletonized in this manner and most of them had curled up. Often caterpillars were found in these curled leaves. The remains of egg masses were found on the undersides of the leaves.

Caterpillars brought into the laboratory fed for a time but soon showed a tendency to congregate in the curled leaves and do no more feeding. It was evident that they were going to hibernate in this partly grown condition. Attempts to bring them through the winter were not successful.

The aster plants die down in the fall and new growth comes up in the spring. The location of these plants was marked and first attempts to find them in the spring were on April 20, when there was still some snow in the canyon. By May 10, growth of the plants was noticeable and a few larvae were found. On May 18, larvae were fairly plentiful, feeding individually. They were then in the 4th and 5th instars. There had evidently been considerable winter mortality. A temperature of –19° F. had been recorded by the Weather Bureau near that area on December 17, but at that time there were about 10 inches of snow on the ground. This should have protected most of the caterpillars.

Some of the caterpillars were brought into the laboratory where they began pupating on May 19. Emergence of most of the butterflies took place between May 28–31. It was no doubt hastened by the room temperature, as no adults were seen in Bear Canyon until June 4. They continued to fly until July 6, and in other years have been seen there as late as the end of July.

Oviposition was observed June 23, when a female was flushed from a clump of asters. She soon settled down again, crawled to the underside of a leaf, and deposited 30 eggs during the next seven minutes. The leaf she had flown from was then examined and a cluster of 82 eggs was found which she had apparently just deposited. Many other egg clusters were present and the eggs in 12 of these were counted. They ranged from 25 to 179 per cluster, and averaged 72. Evidently a single female is capable of depositing about 200 eggs.

Some of these eggs hatched June 30 and the caterpillars went into diapause July 17. The eggs deposited June 23 hatched July 2 and these caterpillars were still feeding July 18, when I went away for a week. On my return most of them were alive and quiescent and would do no further feeding.

Thus, at room temperature, the egg stage lasted about nine days, larval feeding in the fall lasted two to three weeks, there was another feeding period in the spring of perhaps two weeks, and the pupal period was a week or ten days.

Abrams and Ferris (1960) give the range of *Aster conspicuus* as "British Columbia south through eastern Washington to northeastern Oregon and east to Saskatchewan, Wyoming and South Dakota." It does not occur in the Oregon Cascade Mountains but only in the Blue Mountains in the northeastern part of Oregon. In 1965 I examined a number of localities where *manchada* has been taken and found *Aster conspicuus* in every one. It does not follow, however, that the range of *manchada* is the same as that of *conspicuus*, but, unless *manchada* has

other foodplants, its range must be within that of the aster. Bauer (1959) has suggested that the Columbia River Gorge, between Washington and Oregon, may have sufficiently isolated the *hoffmanni* population north of the Gorge so that it became differentiated. It might also be suggested that the different foodplant has had some influence, since *segregata* in Oregon and *hoffmanni* in California must feed on asters other than *conspicuus*.

Description of early stages

Ova.—Width 0.6 mm, light green, fluted; deposited in masses, somewhat overlapping.

Larvae.—First instar: Head width 0.4 mm, black with many small setae. Body length 1.5 mm, light cream with many long setae.

Second instar: Head width 0.6 mm, black. Body length 2.25 mm, gray, shiny, some lighter markings, many setae. Cervical shield black with six black spines. Thoracic segment I with a lateral tubercle bearing several spines; segments II and III with dorsolateral and lateral spine-bearing tubercles; abdominal segments 1–8 with seven tubercles each, one dorsal and the others lateral, arranged transversely; segment 9 with two dorsal tubercles and only two small lateral ones, each with a large terminal spine and several smaller ones; anal segment with two large dorsolateral tubercles. Thoracic legs dark brown, abdominal prolegs concolorous.

Third instar: Head width 1.0 mm, black, somewhat cleft, with numerous black setae. Body length 6–8 mm, dark gray above, lighter below; a narrow, darker dorsal stripe and a wider dark dorsolateral stripe. Dorsolateral tubercles black, lateral light yellow.

Fourth instar: Head width 1.5 mm, color as in preceding instar. Body length 10–15 mm, color as in preceding instar.

Fifth instar: Head width 2.0 mm, black, cleft, with setae as before. Body length 16–19 mm, as much as 25 mm when fully fed; color black above with numerous whitish dots; tubercles and spines located as before, those above lateral line black, circled with white. A cream-colored scalloped line just above the spiracles; color below that and on venter brownish, tubercles here brown. Thoracic legs black.

Pupae.—Length 11–13 mm, width at thorax 5 mm; shape typical of Melitaeinae. Basic color pearly white to brownish with many irregularly shaped brown to blackish markings.

Literature Cited

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