Journal of the Lepidopterists' Society
35(3), 1981, 243–244

NOTES ON EARLY STAGES OF *NYMPHALIS CALIFORNICA* (NYMPHALIDAE)

On 23 March 1972 *Nymphalis californica* (Boisduval) flew abundantly near Alpine Dam, Marin County, California. Two females were collected, and confined in a tub with a small plant of *Ceanothus ramulosis*. On 29 March a stack of pale green eggs was found on the top surface of a leaf near the growing tip of the plant (Fig. 1).

This cluster was about 5 mm across, and near 3 mm high in the center, and suggested a miniature bunch of grapes. Eggs were ovoid, each with eight vertical ribs, which became more prominent where they converged at the apex; diameter was near 0.65 mm; about 40 ova made up the stack.

On 4 April color began to change; on the 5th, ova were blackish, the ridges showing

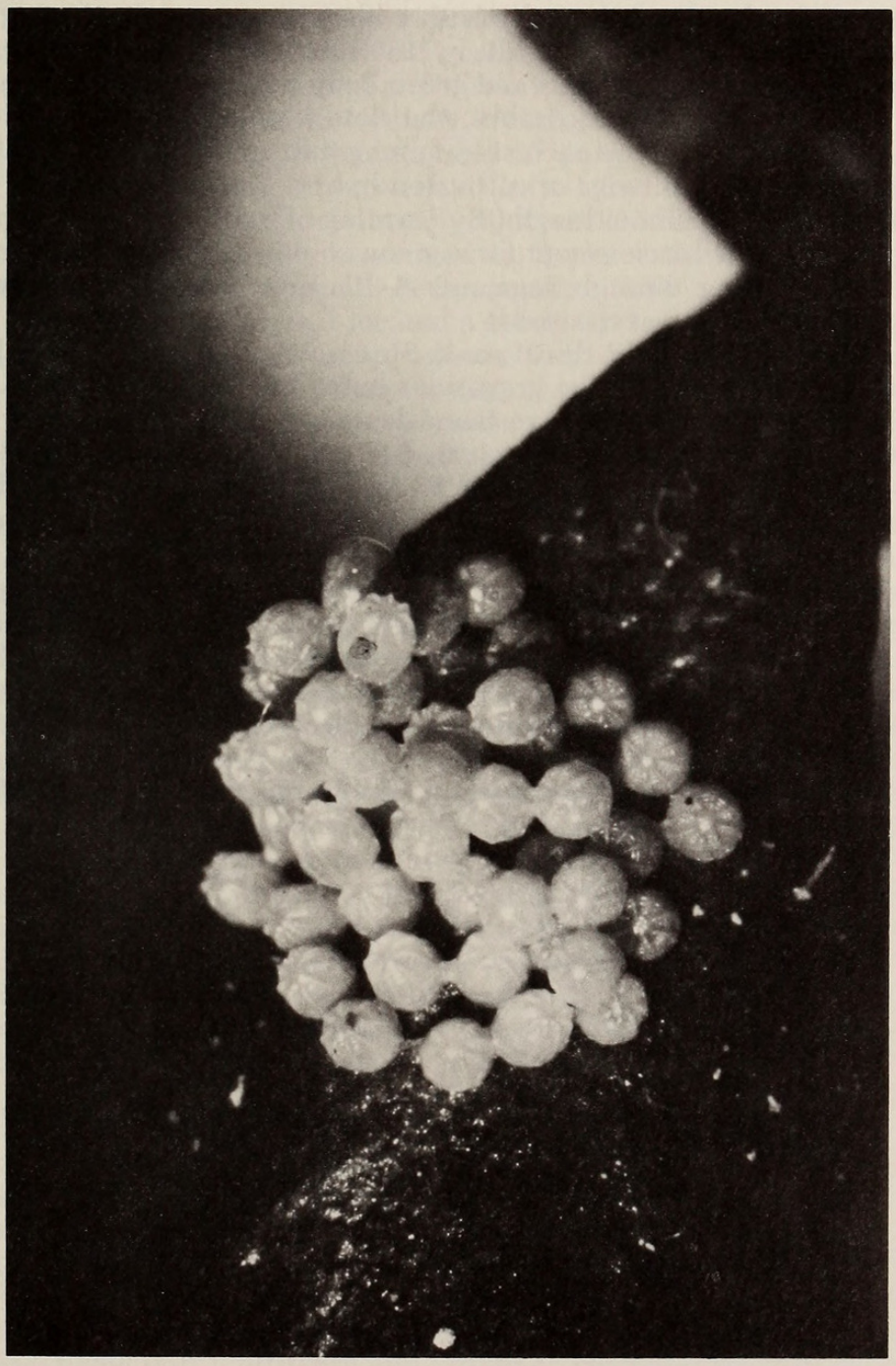

FIG. 1. Cluster of ova of *Nymphalis californica* on leaf of *Ceanothus ramulosis*. (Enlarged 10×.)

as white tracery. That evening hatching began. By morning most larvae were out. Young caterpillars were dull green, sparsely clothed with hairs, with very large, shiny black heads. Their length was between 1.5 and 2 mm. By 1300 on 6 April, most were crowded together on a small leaf just below the terminal bud and had eaten holes there. Next morning it was found that they had covered two leaves and the terminal bud with webbing. On this day the group was observed jerking the fore parts of their bodies in unison in a semicircular motion at a 2-second interval. This motion may have been provoked by some sound or vibration, but nothing was touching or approaching them.

On 8 April the colony moved to a new location and moved again on the 9th. Each time, after completely devouring the surface of 4 to 6 leaves, they crawled down the stem about 4 cm lower, leaving silk as they went, and gathered and began to eat again.

On 10 April the larger of the larvae were about 4 mm long; green with darker shading of thoracic and posterior segments. Each segment was marked dorsally with what resembles a colon and a dash (:—), laterally with a blackish square. On 11 April most of the larvae were pausing for the first moult; by 1600 some had completed this. Second instar larvae still had shiny black heads and green body color, darker at the ends. There was a dorsal line of black dots and dashes; the dots were tubercles, and from them, and two rows of black tubercles on each side, sprang tufts of bristles. During 2nd instar the larvae were transferred to twigs of cultivated hybrid *Ceanothus*.

On 15 April some were 8 mm in length. By morning of the 17th some had passed the 2nd moult; color was now black except for a greenish dorsal stripe with a central line of black dashes extending through segments 4–10. From the tubercles arose short spines with a little branching at the ends.

By 22 April some had passed the third moult. Spines were longer and more branched. By the end of this (the 4th) instar the gregarious habit had been abandoned.

Larvae of the 4th and 5th instars have been described in detail by Henry Edwards (1875, Proc. Cal. Acad. of Sciences, ser. 1, 6: 146–149.), and extracts from these descriptions are repeated in many later works. To those descriptions I will add only that color varied considerably, even in caterpillars of the same brood. Many were velvety black, with a blue glint at base of tubercles, and white hairs scattered over the body, giving a frosted appearance. Some had yellow dorsal patches, and in some a part of the spines were yellow.

On 3 May larvae began to hang up for pupation, and late in the month butterflies emerged; thus, the cycle from oviposition to eclosion covered about two months. In the warmer habitats, which the species frequents, the cycle would be shorter.

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