

**NOTES ON THE LIFE HISTORY OF FEBRUARY HIGHFLYER  
HYDRIOMENA NUBILOFASCIATA PACK. f. VULNERATA SWETT  
(Lepidoptera: Geometridae)**

GEORGE A. HARDY

Provincial Museum, Victoria, B. C.

The species of the genus *Hydriomena* are very variable yet difficult to separate and since any facts concerning the life-histories may be useful in determining their true status, the following notes on *Hydriomena nubilofasciata* Pack. f. *vulnerata* Swett. are presented.

The February highflyer is quite common and in some years very abundant about trees of the Garry oak, *Quercus garryana* Dougl., in the vicinity of Victoria, B. C. During the flight period, February and March, the moth is readily attracted to artificial light. By day it rests on tree trunks, the underside of branches, copings, or any place that will provide seclusion away from direct sunlight. It is very alert and is not easy to approach when at rest, for it takes flight quickly and usually before it can be seen by a would-be captor.

As the intention was to investigate the details of its life-history, females were particularly sought in order to obtain a supply of eggs. It was found that those individuals that came to light, especially during the early part of the season, were males; females were taken more commonly towards the end of the flight period, although by that time most of them had already deposited their eggs. After a few futile attempts to obtain gravid females it was discovered that the best method was to search the bushes and adjacent herbage or low hanging branches of the oaks, with a torch or lantern, when it was possible to find an occasional specimen either in copulation or quietly resting.

The following observations were made during the spring of 1949. Partly due to the elusive habits of the larvae the exact sequence of the moults was not precisely ascertained, hence a more or less chronological account has been adopted.

**Ovum.** Laid on March 26, 1949. Length 1 mm., width .05 mm. Elongate oval, slightly flattened at one end, surface minutely pitted or reticulated,

smooth, shining. Colour white, turning to a light cinnamon towards hatching time.

The eggs were laid indiscriminately on the sides of the jar or over oak twigs inserted for the purpose. One female taken under natural conditions had packed her eggs into the dried and empty capsule of a garden *linaria*, far removed from any oak twigs. The number of eggs obtained from each of several females was 10 to 18. These were laid between March 5 and 26.

**Larva. April 17:** emerged from egg. 1st instar, length 1 mm. Head black, body dull green, smooth. The larva does not eat the egg shell, but immediately seeks a bud that is just breaking and burrows into the centre where it remains concealed in a little cell hollowed out by eating into the substance of the bud.

**April 26:** Length 4 mm. Head black, body drab fuscous brown, smooth, shining. The only external evidence of life in the bud is the accumulation of frass between the incipient leaves. Judging by the size of the larvae this may be the 2nd or 3rd instar. Some larvae were just undergoing a moult.

**April 29:** Moult completed. Length now 6 mm. Colour and appearance as before. Some of the larvae show signs of leaving the bud which is rapidly opening into leaf.

**May 1:** Evidently another and unobserved moult has been effected. Length now 8 mm. Head brown with black flecks, body dull black with three indefinite longitudinal dorsal lines of small beige-coloured spots. Ninth abdominal segment pale beige. The larvae are still feeding concealed between base of leaves of the young shoot.

**May 2:** Length 12 mm. Head brown with black flecks, body black with four milky-white interrupted lines on dorsum and similar lateral lines, ventral surface lighter in colour.

**May 4:** As the leaves grow the larvae resort to folding over the leaf tip or hiding between two leaves where they lie concealed, usually curled up. They feed on the parenchyma, leaving the upper surface of the leaves intact. When disturbed they snap the fore part of body back and forth.

**May 6:** Evidently the 4th or 5th instar. Length 15 mm. Head light brown as before, body *creamy green* with interrupted dorsal and lateral lines dusky. Spiracles black. The larvae continue to feed under cover of folded leaves. If violently disturbed they escape from the leaves and suspend themselves by a silken thread.

**May 8:** Length 20 mm. Colour and markings as before but more decided in tone.

**May 11:** Length 24 mm. This may be the 5th or 6th instar. Colour as before but richer and markings more pronounced. The larvae consistently seek cover between folded portions of the leaves.

**Pupa.** Pupation May 21 in fold of leaf or in a light silken cocoon spun in the sand at bottom of cage. Particles of sand adhered to the cocoon rendering it almost invisible. Length 11 mm., width 3 mm. Colour light brown turning to dark brown in 24 hours, smooth, shining. Cremaster with two long hooked setae and several very short ones at base. The pupae were kept throughout the summer at average room temperature.

**Imago.** Emerged January 19, 26 and February 8, 1950. Two males and one female. The first recorded emergence under natural conditions was February 18.

**Remarks.** There are several interesting features in the life-history of this species. *First*, the larva is completely a bud feeder in the early stages, completing its growth concealed in folded leaves. *Second*, the change of colour from black to green may be significant as the colour matches the green leaves on which growth is completed, thus rendering the larvae less conspicuous. *Third*, from the unusual length of the pupal period, it might be expected that a second brood would intervene between the spring of one year and that of the next, but the newly opened bud seems to be an essential requirement for the young larvae.

**Summary.** The February highflyer, *Hydriomena nubilofasciata* f. *vulnerata* feeds in the larval stage on Garry oak, *Quercus garryana*. The adult is on the wing in the months of February and March. The eggs are assumed to be laid on or near the buds, in which the larvae feed. The larvae change colour from black to green as the leaves develop. The pupal stage which is passed in the ground lasts for about nine months or until the opening buds are ready for the newly hatched larvae. The life cycle as here observed is divided between the stages as follows, ova—22 days, larvae—34 days, pupae—243 days, imagines—over a period of 60 days.

#### A FURTHER NOTE ON BREEDING LAMBDA FISCELLARIA SOMNIARIA HIST.

Supplementary to my previous experiment with the larvae of *Lambdina fiscellaria somniaria* Hist., reported in the Proceedings of the Entomological Society of British Columbia, Volume 45, page 6, this note is now submitted.

On June 2, 1949, while "beating" Garry oak, *Quercus garryana* Douglas, in the Uplands District of Victoria, B. C., 21 very small larvae of this species were obtained. On June 26, when about half an inch in length, the larvae were sleeved on western hemlock, *Tsuga heterophylla*. The small larvae readily accepted this food and thrived and by August 22, 18 of them had pupated in the folds of the sleeve. Three larvae were in their

rudimentary cocoons in a dormant state. They were transferred to a ten inch flower-pot, in which some soil had been placed and on which a generous layer of moss was spread. The pupae, after removal from their cocoons, together with the three "resting" larvae which were left in their flimsy cocoons, were placed on the moss.

Sixteen imagines were obtained between August 3 and October 3, 1949. The imagines were of normal size and in colouring were very similar to typical *somniaria*, though possibly a trifle greyer than is generally the case when the larvae have fed exclusively on Garry oak.—J. R. J. Llewellyn Jones, Cobble Hill, B. C.