



S. 1753

**Notes on the larvae and pupation of the Geometrid Moth
Phorodesma smaragdaria F. (Lep.).**

My kind friend Mr. Hugh Main, who has so often given me great pleasure by sending rare and interesting insects for study, wrote on 12th May, 1936, the following letter accompanying the hibernated larvae of *Phorodesma smaragdaria* which are the subject of these brief notes:—

‘I found the larvae of the “Essex Emerald” last autumn in the Essex marshes, and they hibernated and recently started to feed again. They were on *Artemisia maritima*, which is abundant all along the banks of the various rivers on the Essex coast. I had put into the garden some plants of the garden *A. abrostanum* for them, but I found some time ago that they would eat *A. vulgaris*. The leaves of this species are, however, not so suitable for providing “coats.” South also gives *A. absinthium*. I enclose a couple of sprays of *maritima* that should carry you over till you get another supply. The larvae spin up nicely among the leaves and stems of the *Artemisia*. The food-plant is apt to dry up rather readily unless kept in cages with a slightly damp atmosphere.’

Mr. Main also directed my attention to the papers on this species by the Rev. C. R. N. Burrows (1900, *Ent. Rec.*, **12**: 113-5, 152-4, 169-71 (Pl. VII), 171-2), who himself refers to the paper by G. Elisha (1886, *Trans. Ent. Soc. Lond.*, **188**: 465-8).

The supply of *A. maritima* L., which arrived with the larvae, lasted well in glass, white-muslin-topped, cylinders resting on plates drilled for the stalks to pass through into water beneath. The following species of *Artemisia* are mentioned by Mr. Hugh Main as among the plants eaten by these caterpillars: *abrostanum* L. (Southern Wood, Old Man), *absinthium* L. (Wormwood), *vulgaris* L. (Mugwort), and in addition *Tanacetum vulgare* L. (Tansy) has been found acceptable. My larvae, however, did not appear to thrive on these species after their earlier stages on *A. maritima*, and when a second supply of this plant, kindly sent by Mr. Main, was nearly exhausted, I began to feel anxious until Mrs. Moullin, the Secretary of Oxford University Botanical Dept., kindly sent an ample amount of *A. mutellina*, which is growing in the Botanic Gardens. The result was so satisfactory that I think entomologists will be glad to know more about this food-plant. Prof. A. G. Tansley, F.R.S., has kindly written the following account of it:—

‘12th June, 1936 — *Artemisia mutellina* Villars is apparently properly called *Artemisia laxa* (Lamarck) Fritsch. It is an alpine plant, known to the German-speaking people as “Edelraute,” and is said to be so much prized and sought after that it has become rare in many parts of the Alps, especially in the Austrian Mountains. It is used as a tonic, febrifuge, etc., and also

decoratively.'

The wonderfully procryptic effect of the fragments of food-plant attached to the larvae gave very great pleasure to me and to the many friends who saw the caterpillars, and I thought that a careful study of the mode of attachment, investigated with the help of modern instruments, would be extremely interesting. I therefore asked my friend Dr. B. M. Hobby if he would undertake this work. He consented and has written the illustrated statement which follows these notes upon the four larvae and especially upon the behaviour of two of them prior to pupation.

Larva 1 appeared to be mature on June 9th and was taken to the Hope Dept. for Dr. Hobby to study. It was brought back on the same day and in about twenty-four hours had spun a cocoon on the muslin cover. On June 15th, about 10.0 a.m., I observed that the larva had bitten a hole in the cocoon and that about half its length was hanging free. A little later it had fallen a distance about 4 ins. on to the plate and at about noon I carried it to the Dept. for Dr. Hobby to draw. When, however, he arrived on June 16th to finish the work, pupation had occurred and the chrysalis had already darkened to the permanent shade of brown. A male emerged June 28th-29th.

Larva 2 began to spin on June 12th and, unlike any of the others, gnawed a hole in the muslin cover. When this was taken off and replaced the disturbed larva returned to the hole in a few minutes and again gnawed the muslin. Although feeding had ceased the larva continued to pass faeces from time to time, three being removed about 5.30 p.m., one later the same evening, two on the morning of June 13th and one (the last) at 4.15 p.m. On the morning of June 13th the larva had abandoned the hole and was apparently spinning at another part of the muslin. On June 14th it was certainly spinning at the same spot as on the day before. On June 16th the cocoon was taken to the Dept., cut open about 3.15 p.m., and the larva removed in order to be studied and drawn. At 3.30 p.m. on June 17th it pupated while Dr. Hobby was at work on the drawing. A female emerged June 28th-29th.

Larva 3 pupated June 11th-12th, the chrysalis being exposed and free from any covering. A female emerged on June 25th.

Larva 4 also produced an exposed pupa June 11th-12th. A male emerged on June 26th.

The behaviour of the larvae suggests a possible transition from pupation in a cocoon attached to the food-plant to a final ecdysis on the ground where the pupa would be hidden among vegetable débris. It must be remembered that the larvae were healthy and produced normal moths, two of each sex.

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