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A note on the larva of *Scoparia pyralella* ([Denis & Schiffermüller], 1775) (Lepidoptera: Pyralidae)

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Synopsis

A description is given of the larva of *Scoparia pyralella* ([Denis & Schiffermüller], 1775) together with an account of its biology. Prior records of the moth being reared are considered. These show that the larva has been observed possibly only once before, in 1908.

Key words: Lepidoptera, Pyralidae, *Scoparia pyralella*, larva, description.

Introduction

Scoparia pyralella ([Denis & Schiffermüller], 1775) is a widespread and comparatively common species, both in the British Isles and mainland Europe, but its early stages are poorly known. It appears that prior to 2009, when two larvae were found in Devon, England, the only published record of the larva being observed was in 1908, and that was described simply as 'dingy'. Apart from that it has been reared by chance on possibly less than five occasions.

Published and unpublished rearing records

The first published note of the species being bred was given by Machin (1875: 81). In an account of Microlepidoptera taken or reared by him in 1874, he says, '*Sesia chysidiformis* and *S. ingratella*. – Seven of the former and one of the latter were reared in July, from the roots of sorrel, collected at Folkestone [Kent], in April.'

Although Machin uses the name '*S. ingratella*' he could not have intended to mean *Sesia ingratella*, an unknown combination, but obviously, although wrongly, meant *Scoparia ingratella* (Zeller, 1846), which does not occur in the British Isles. The reason that Machin used the name *ingratella* is because Knaggs (1867: 61) had stated that a *Scoparia* species that occurred abundantly at Folkestone Warren, Kent, was distinct from *S. pyralella*, then *S. dubitalis* (Hübner, 1796), and was *S. ingratella*. Subsequently, however, what Knaggs believed to be *S. ingratella* was recognised as simply a form of *S. pyralella*, as confirmed by Whalley & Tweedie (1963: 87–88), under *S. arundinata* (Thunberg, 1792), in their revision of the British Scopariinae.

Machin stated that the species was reared from roots of 'sorrel'. This name could apply to either *Rumex acetosella* L. or *Rumex acetosa* L., whose current usual English vernacular names are Sheep's Sorrel and Common Sorrel

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respectively. Machin must have meant *Rumex acetosa* because in the British Isles the larva of *Sesia chysidiformis*, now *Pyropteron chrysidiformis* (Esper, 1782), feeds in the roots of that species but not *Rumex acetosella*.

Fifteen years later, by which time it was realised that specimens from Folkestone were not *Scoparia ingratella*, Machin (1890: 22) states that he bred 'one or two specimens of *Eudorea dubitalis*, eight or nine years ago, from roots of sorrel collected at Folkestone, on Good Friday, when searching for larvae of *Sesia chysidiformis*. The larvae must have been among the roots but I did not notice them. There was little or no moss among them.'

This note suggests that he neither kept a record of when he collected the sorrel roots nor retained the specimen(s). I think it likely that he was simply repeating, with less accuracy, the record that he had published in 1875, rather than publishing an account of rearing the species from the same locality on a second occasion. It appears from a note by Thurnall (1907: 42), referred to below, that this was probably his view as well.

Barrett (1904: 318–319) states that the larva is unknown but that Machin 'reared two or three specimens from unnoticed larvae or pupae among roots of sorrel (*Rumex acetosa*) which had been dug up in search for the larva of *Sesia chysidiformis*'. He comments that the example of *Scoparia cembrae* Haworth, 1811, now *S. subfusca* Haworth, 1811, encourages a suspicion that this species might ultimately prove to be a root feeder. The larvae of *S. subfusca* had recently been found by Wood (1888: 126–127) feeding on the tap-roots of *Picris hieracioides* L. down to a depth of six inches.

Thurnall (1907: 42–43) states that 'Until comparatively recently all the larvae of this genus were supposed to feed on moss or lichens only, but thanks to Dr. Wood (Ent. Mo. Mag., xxv, p. 126) we now know that one of them (*cembrae*) is entirely a *root* feeder. Little or nothing seems to be known about the larva of *dubitalis* [= *Scoparia pyralella*], common as the imago is in many places. Mr. Bankes, to whom I recently wrote for information, tells me that he knows practically nothing of the larva or its habits. Some years ago he confined ♀♀ in pots containing sorrel roots, moss &c., but all to no purpose. It is true that Leech ('British Pyralides'), quoting Hartmann, says the larva feeds on moss and lichen growing on tree trunks in March and April, and Meyrick ('Handbook,' p. 423), says 'larva on mosses, iii, iv.' Many years ago Machin (Entom., viii, 81) records the breeding of a specimen of the var. *ingratella* from sorrel roots dug up in Folkestone Warren when searching for *Trochilium chrysidiforme* larvae, and he again alludes to it in Ent. Mo. Mag., xxvi, 22. This larva of course may have crept into the roots to spin up, as probably it would be full fed at that period of the year. Now for my own experiences. In November, 1884, wishing to breed some *Epiblema trigeminana* [now *E. costipunctana* (Haworth, 1811)], I dug up some roots of *Senecio jacobaeae* [*sic*] near Brentwood, shaking out all the earth and *débris* collected round the base of the stems (which I cut off just above the root stocks), and replanted them in fresh clean earth in flower pots; the *trigeminana* duly appeared in June, 1885, and on the 14th of the same month two *dubitalis* (followed by another the next day) appeared! I am *quite* sure there was no moss for their larvae to feed upon, and if moss feeders, it seems unlikely that they would have been full

fed in *November*, knowing that the larvae of those species which are known to us are not full fed until the *spring*; so, coupling Machin's experience with my own, it seems quite feasible that it may be, like its relative *cembrae*, a root feeder. The imago is usually much more common in rough open fields than in woods, and as Mr. Bankes suggests, the larva may perhaps feed on the ground mosses which usually grow in such places, just as I strongly suspect the larva of [*Eudonia*] *pallida* does in its boggy haunts, but I have never been able to find it. If any reader could give me any information about the larva of either or both the above-named species I should be very grateful.'

Thurnall's note was entitled 'Is *Scoparia dubitalis* a moss or a root feeder?' He did not wait long before dealing with this question. The following year (1908: 186) he stated that, as no answer had appeared, he had endeavoured to find one himself. On 7 May 1908 he visited a spot where he had noticed the adults to be abundant the previous year. He pulled up 'roots of *Rumex acetosella* without any success; as there was no moss to examine I tried the decayed vegetable matter and at once found a larva (a very dingy one even for a *Scoparia*!) feeding just beneath the surface under a very slight web; upon placing it with a handful of its food in a glass vase it obligingly spun its web against the side and fed for two or three more days, as quite a pile of frass testified, and then left, to spin up in a neat little earth-covered cocoon of grey silk, about an inch from where it had been feeding. A ♀ appeared on June 9th. From the above remarks it would seem that the larva is neither a moss- nor root-feeder, unless my solitary larva differed in its taste from its bretheren. I quite expected to find it feeding in spun-together roots of *R. acetosella*.'

Thereafter the pabulum given in the British literature (Meyrick, [1928]: 440–441; Beirne, 1954: 120; Goater, 1986: 47; Emmet, 1991: 168–169) has been either decaying vegetable refuse or plant material and possibly the roots of *Senecio* or *Senecio jacobaea* L., with no mention being made of sorrel.

In the account of this species in his treatment of the Scopariinae of Europe, Nuss (2005: 131–132) states, 'In Britain, larvae have been recorded feeding on decaying vegetable matter, in a slight web under *Rumex acetosella* L. (Thurnall, 1908:186) and Machin (1890: 22) received specimens from a sample of roots of *Senecio jacobaea* L.' However, as can be seen from what is set out above, Thurnall did not find the larva in a slight web under *Rumex acetosella*, whose roots he pulled up without success, but under decayed vegetable matter (presumably dead leaves and other plant material), while Machin did not rear it from a sample of roots of *Senecio jacobaea* but from roots of *Rumex acetosa*; it was Thurnall who reared three moths from, apparently, roots of *Senecio jacobaea* but he did not observe the larvae.

The only other British record of the moth being reared of which I am aware is an unpublished one. In December 1985, Mr M. J. Sterling dug up some roots of *Tanecetum vulgare* L. with soil attached, and no doubt also plant debris, at a tip at Long Eaton, Derbyshire. These were then given to his father, Colonel D. H. Sterling, who placed them in a cage designed by him specifically for the purpose of rearing *Dichrorampha* species. Nothing would have been added to or removed from what had been dug up. The cage was then put out in the garden in the shade after the winter and inspected daily from May onwards.

Dichrorampha sedatana Busck, 1906, emerged in June and on 7 July 1986 one *Scoparia pyralella* was found (Dr P. H. Sterling, *in litt*.).

In summary, prior to 17 March 2009 it appears that the only larva that has been observed in the British Isles and mainland Europe was that found by Thurnall on 7 May 1908, which he described as 'dingy'.

Discovery of larvae in Devon

Over the past few years, on various dates between October and March, I have tried unsuccessfully to find larvae of this species at several Devon localities where the moth occurs, by examining the base of low growing vegetation and general plant debris on the ground.

On 17 March 2009 I visited an area of coast east of Ayrmer Cove, Devon. The weather had been warm, dry and sunny for several days. On a piece of rather crumbly cliff there were a number of plants of *Plantago lanceolata* L. growing fairly close together. Parts of the stems/rootstocks of many protruded about 10–15 mm above ground level with the result that the basal leaves were not laying flat on the ground but drooped from the top of the stems towards the ground. The area between the plants was bare earth covered with dry twisted dead leaves from these plants; there was no moss growing near them. I found two slight webs amongst these dead leaves and under these were two final instar larvae that were clearly Scopariinae. Neither larva was close to the exposed fleshy stems of *Plantago lanceolata* nor were they, even partially, within the soil.

Further searching in that area, not only amongst dead leaves of *Plantago lanceolata* but also amongst other dead leaves on the ground or at the base of various plants, including *Rumex acetosa*, failed to produce any more similar larvae, although various Crambinae larvae were found.

Both larvae were provided with almost entire plants of *Plantago lanceolata* as well as dead leaves of that plant, but nothing else. The following day one of the larva spun a cocoon amongst the tissue in its container and a female *Scoparia pyralella* emerged on 24 April 2009. The other spun some silk on a stem beneath the basal leaves of one of the plants and then produced some slight webbing incorporating some of the dead leaves. I was not able to observe it feeding but it seemed clear from the lack of any signs on the stem that it had not fed on that, and so, presumably must have fed on the dead leaves. This larva spun a cocoon on 4 April 2009 but nothing emerged from this.

Description

Larva (Figs 1, 2). *Final instar*. Length 13–14 mm. Head yellowish brown, labrum blackish, stemmata black, black lateral mark from near posterior margin of head to posterior edge and upwards along the posterior edge towards, but not reaching, the epicranial notch; prothoracic plate pale yellow-brown, with several small blackish marks and an indistinct whitish medial division, shiny and rather translucent but without the body colour showing through, unlike the larva of *Scoparia ambigualis* (Treitschke, 1829); body red-brown or yellowish red-brown, with some dark grey body contents visible, pinacula large, shiny, sclerotised, dark grey or olive grey becoming paler posteriorly, with either one or two very small black marks from each of which arises a short black seta, also with a small black mark within each

Photos: R. J. Heckford.

Figs 1, 2. Larva of *Scoparia pyralella* ([Denis & Schiffermüller], 1775); 17.iii.2009.

anterior dorsal pinacula on abdominal segments 1 to 8 anterodorsad of such setal bearing black mark or marks; peritremes of spiracles small, black; anal plate similar in colour to the pinacula on abdominal segment 9, with several yellowish brown and black spots; thoracic legs shiny, grey; ventral and anal prolegs translucent whitish, a black mark within the planta appearing almost triangular, and not square as in *Scoparia ambigualis*, just above the crochets on the outer edge of the planta, crochets yellowish brown.

Like those of *Scoparia ambigualis* and *S. basistrigalis* Knaggs, 1866, the four dorsal pinacula on thoracic segments 2 and 3 are more or less elongate rhomboid, the longer axis being longitudinal, and each bear two setae, one being dorsolateral of the other, whereas the anterior pair of the dorsal pinacula on each abdominal segment 1 to 8 are almost square and the posterior pair are elongate rectangular, the longer axis being transverse. Again, like those two species, there is no narrow, elongate sclerotized area straddling the median area posterior to these pinacula on thoracic segments 2 and 3, unlike the larvae of some species of *Eudonia* and Crambinae that I have seen.

Pupa. Not described, within a fairly strong cocoon; exuviae pale yellowish brown, not extruded on emergence of the moth.

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