

Notes on the early stages of four species of Oecophoridae, Gelechiidae and Pyralidae (Lepidoptera) in the British Isles

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Synopsis

Descriptions are given of the early stages of *Pseudatemelia josephinae* (Toll, 1956), *Argolamprotes micella* ([Denis & Schiffermüller], 1775), *Hypatima rhomboidella* (Linnaeus, 1758) and *Pyrausta cingulata* (Linnaeus, 1758).

Key words: Lepidoptera, Oecophoridae, Gelechiidae, Pyralidae, *Pseudatemelia josephinae*, *Argolamprotes micella*, *Hypatima rhomboidella*, *Pyrausta cingulata*, ovum, larva.

Pseudatemelia josephinae (Toll, 1956) (Oecophoridae)

It appears that the only descriptions of the ovum, larva and life-cycle in the British literature are those given by Langmaid (2002a: 103–104) and these are stated to be based on those by Heylaerts (1884: 150).

Heylaerts' paper begins by referring to an account of the larva given by Fologne (1860: 102–103), under the name *Oecophora flavifrontella* ([Denis & Schiffermüller], 1775), now *Pseudatemelia flavifrontella*. Heylaerts also uses the name *Oecophora flavifrontella* but Langmaid follows Jäckh (1959: 174–184) in attributing Heylaerts' description to *Pseudatemelia josephinae*, then an undescribed species. Although neither Fologne nor Heylaerts gives any indication of localities, because they published their accounts in a Belgian periodical I presume that both found the species in that country. After *P. josephinae* was described in 1956 it was found to occur in Belgium.

Fologne (1860: 102–103) states that he found cases in May on the trunks of 'hêtres', beech trees (*Fagus sylvatica* L.), onto which he assumed they had climbed towards evening to eat and that during the day they remain concealed amongst dry leaves. He reared them by giving them beech, presumably dead leaves but he does not say so, and lichens but comments that he could not say with certainty what they normally ate.

He gives no larval description but provides two coloured illustrations of the larva, shown dorsally and laterally, as well as two coloured illustrations of the larval case (1860: pl. 2, figs 6, 6a, 6b). Although not stated, I assume that the illustrations (Fig. 1) are made from a final instar larva. The head and prothoracic plate are black, the body whitish tinged pink dorsally, with a considerable number of pinacula of differing sizes, the larger ones brown, the smaller ones possibly pale brown or grey, a large brown anal plate, brown thoracic legs, with the femur and tibia black distally and prolegs concolorous with the body.



Photo: M. R. Honey

Fig. 1. Plate 2, fig. 6 in Fologne (1860), illustrating the larva of '*Oecophora flavifrontella*'.

Fologne records that moths were reared; because he does not make any mention of the larvae overwintering I assume that moths emerged in the same year as he found the larvae.

Heylaerts records that ova were laid on 2 July 1882 and larvae hatched between 10 and 15 August, but does not indicate when the adult was taken or the type of habitat. He describes the ovum, the newly hatched larva, how the larva makes its case and comments that Fologne has perfectly figured the larvae and that his, Heylaerts', are the same except for the colour. That comment is then followed by an account that I assume is of the final instar, although this is not stated. No mention is made of pinacula, but this is presumably because they did not differ from Fologne's illustrations that clearly show these. Heylaerts' paper, like Fologne's, was written in French, and Langmaid (2002a: 103–104) provides an English version, referred to below.

Heylaerts records that the larvae preferred dry leaves of *Vaccinium myrtillus* L. to all other species of dry plant. He notes that the larval stage lasts two years as the larvae pupated in early April 1884, but does not say when, if at all, moths emerged.

When Toll (1956: 185–188) described *P. josephinae*, under the generic name *Tubuliferola*, he said that the larva makes a case cut from a piece of leaf but gave no larval description. He did not mention the accounts by Fologne or Heylaerts, either in relation to this species or *Pseudatemelia flavifrontella*.



Photos: R. J. Heckford



Figs 2, 3. Larva of *Pseudatemelia josephinae* (Toll, 1956).

Jäckh, in a paper dealing with 12 species of *Tubuliferola*, including the species now known as *Pseudatemelia flavifrontella* and *P. josephinae*, attributes Heylaerts' description to *P. josephinae* (1959: 183–184) and not to *P. flavifrontella* but gives no explanation for this; I am not clear why he made this attribution.

Langmaid (2002a: 103–104), based on Heylaerts, describes the ovum as oblong and strongly grooved longitudinally, brownish yellow initially but turning reddish after two or three days. He states that the newly hatched larva is reddish with a black head, prothoracic plate and anal plate and describes how the larva makes its case. He observes that the fully fed larva was described by Heylaerts as follows: head, which is strongly spotted, mostly black, with mouth-parts jet black; body greyish brown; prothoracic plate reddish brown. Because Fologne's paper is not referred to, the pinacula are not mentioned. In fact the larval body of *P. josephinae* has a considerable number of conspicuous pinacula.

As a result of seeing both the coloured figures of the larva provided by Fologne (1860: pl. 2, fig. 6), apparently of *P. josephinae*, and also observing an undoubted larva of this species, described later in this paper, it did not seem to me that the head was strongly spotted and mostly black but was entirely black with numerous small indentations. The words Heylaerts uses are 'La tête, profondément et fortement ponctuée, est plus noire ...' I believe that Heylaerts' use of the word 'ponctuée' to describe the head (la tête) was intended to mean punctate or pitted, and not spotted.

If there might be any uncertainty as to whether or not Fologne and Heylaerts were dealing with this species, the following is an undoubted, although incomplete, account of the early stages of *P. josephinae*.

By an odd coincidence, exactly 125 years after the ova were laid that were described by Heylaerts, I caught a female *P. josephinae* (confirmed in due course by examination of a genitalia preparation) on 2 July 2007 just outside Newtonmore, East Inverness-shire, Scotland (V.C. 96). It was late afternoon and I was sitting in my car with the driver's window open when I noticed that a *Pseudatemelia* species had landed on the windowsill of the driver's door. I kept the specimen in the hope that it would produce ova, which it did when six were laid on 4 July. These proved fertile and larvae hatched from all the ova on 19 July. Unfortunately I failed to rear any moths although larvae were still feeding by early 2008. Apart from during the period between the larvae hatching from the ova and starting to construct their first cases, which they did almost immediately, I was only able to observe the appearance of a larva whilst I happened to be watching one making a new case, when it was about half grown.

After hatching from the ovum the larva makes a case by spinning a considerable number of silken strands from the edge of a leaf to a few millimetres away from the edge, with the larva below the strands. Somehow, possibly as a result of the silk drying and becoming shorter, this causes the edge of the leaf to fold upwards and eventually becoming a tube, which the larva then cuts around to form its case. As recorded by Heylaerts, the larvae made new cases at each ecdysis but I was not able to observe any case being

cut out. The larvae were offered dead leaves of deciduous species of *Quercus* and *Vaccinium myrtillus* and used both to make their cases, although they appeared to prefer the latter.

Description

Ovum. The shape is as described by Heylaerts, oblong and strongly grooved longitudinally, but each end rounded and each ridge between the grooves has a considerable number of indentations, giving a dimpled appearance. Initially very pale yellow, after three days the area where the head eventually forms became bright pinkish red and gradually, over nine days, the overall colour changed to pinkish red, then becoming dark pinkish purple the day following completion of this colour change, except for the head area which was now black. All the ova changed colour at about the same time and all the larvae emerged the day after the ova turned dark pinkish purple.

Larva. First instar. Head and prothoracic plate black; body dull pinkish red, pinacula concolorous with body and more or less circular, except the dorsal pinacula on thoracic segments 2 and 3, which are triangular, with a very small black area surrounding the seta on thoracic segment 2, but not 3. I was not able to observe other features.

About half grown (Figs 2, 3). Head black with numerous small round or oval indentations; prothoracic plate black without indentations; body dark grey dorsally and very dark grey dorsally on thoracic segments 2 and 3, becoming paler grey posteriorly, laterally and ventrally, with a pinkish red suffusion below cuticle which shows through abdominal segments 1–8, particularly through intersegmental divisions; two large, subtriangular dorsal pinacula on thoracic segments 2 and 3 and on segment 3 only a much smaller sub-triangular pinaculum adjoining the inner edges of each anteriorly with two more elongate pinacula posterodorsad of these, all these pinacula very dark brown or black, on each of abdominal segments 1–7 at least 22 dorsal pinacula of varying sizes and shapes, some circular, others more elongate, these pinacula of varying colour but mainly dark brown but some almost colourless with a pale brown area surrounding the base of the seta, on abdominal segment 8 about 12 dorsal pinacula, most elongate but some circular, on abdominal segment 9 three large, elongate, dorsal pinacula, the lateral pinacula on thoracic segments 1 to 3 and abdominal segment 1 very dark brown, rhomboid, on other abdominal segments elongate or circular, variable in colour, some very dark brown, others almost colourless with a pale brown area surrounding the base of the seta; peritremes of spiracles pale brown; anal plate pale yellow-brown, anterior to this and almost adjoining is a shiny dark brown, comparatively large, slightly curved, sclerotized plate; thoracic legs translucent pale yellow, pale yellow-brown sclerotized area distally on femur and proximally on tibia; ventral and anal prolegs translucent, colourless, crochets reddish brown.

Argolamprotes micella ([Denis & Schiffermüller], 1775) (Gelechiidae)

Heckford (1998: 156–157; 2002: 80) gives an account of the final instar, as a result of finding larvae 3–4 mm long on 3 April 1997 at Hardwick Wood, Plympton, Devon, England (V.C. 3), but from observations in 2008 it is clear that one or more of the early instars differs from that description.



Photo: R. J. Heckford

Fig. 4. Larva of *Argolamprotes micella* ([Denis & Schiffermüller], 1775) in shoot of *Rubus fruticosus* agg.

On 16 March 2008, again at Hardwick Wood, I found a few larvae, all about 2 mm long, in shoots of *Rubus fruticosus* agg. (Fig. 4). These differed from those that I found in 1997 mainly in the body being unicolorous pale orange, whereas the body colour of the final instar described in 1997 was yellow-white with the anterior half of all segments, except thoracic segments 2 and 3, reddish and with reddish dorsal, subdorsal and lateral lines. Moths were reared to confirm identification.

Description

Larva. *Early instar* (Fig. 5). 2 mm long. Head black; prothoracic plate appearing black, but under magnification very dark grey; body slightly shiny, pale orange; pinacula concolorous with body; peritremes of spiracles dark grey; anal plate black; thoracic legs appearing black, but under magnification very dark grey; ventral and anal prolegs translucent colourless, crochets black.

At the next instar, when the larvae were about 3 mm long, they took on the colour and markings of the final instar; at that stage the body markings were not so distinct but they became more distinctive as the larvae grew.

Final instar (Fig. 6). The descriptions referred to above in Heckford (1998: 156–157; 2002: 80) are not repeated here but it is hoped that the accompanying photographs of the early instar and final instar show the differences in appearance.



Photos: R. J. Heckford
Figs 5, 6. Larvae of *Argolamprotes micella* ([Denis & Schiffermüller], 1775).

***Hypatima rhomboidella* (Linnaeus, 1758) (Gelechiidae)**

The first account of the larva in the British Isles was given by Richardson (1882: 114). He says that in the latter part of June 1882 his wife discovered a small pinkish brown larva with a black head and second segment, in rolled leaves of a *Betula* species. They then found more larvae and moths were reared.

Richardson gives the following description:

‘The larva rolls up a leaf longitudinally and eats about half of it, sometimes also eating a little from a neighbouring leaf. It then proceeds to the next leaf nearer to the tip of the shoot, as if the leaf it had left had become too old and hard for its jaws, and treats it in the same manner. In some cases I have found it rolled up in one of the very small leaves only about a quarter developed, close to the very tip of the shoot. When full fed it spins a slight cocoon, and turns to a pupa of a light brown colour, and thickly covered with short hairs like the pile of velvet, except between the segments. The moths began to emerge on the 29th of July. I have also bred this species from bramble [*Rubus fruticosus* agg.].

‘I append a description of the larva:

‘Length, 4 ½ lines. Head black, rough like morocco leather, and shining; 2nd segment with a black plate above like the head, with slight indications of a pale dorsal line, and a small triangular black plate on each side. The general colour of the body is a brownish-pink, of which the shade varies considerably in different individuals. The pink predominates in the central portions of each segment on the back and upper parts of the sides; the portions between the segments and the under parts of the body have a light brownish tinge, with a very faint trace of the pink colour. The usual spots are small and black, and generally very inconspicuous. The hairs emitted by them have mostly a brownish tinge, those on the back being darker, sometimes quite black, and two at the anus, as well as a few on the sides of the front segments, are blackish with light-coloured rings. The legs are almost black, but the light ground-colour shows rather conspicuously between their segments; the claspers are of the light brown ground-colour, tinged with pink on the outsides, the rings of hooks at the feet being darker brown; the spiracles are inconspicuously edged with black.’

Immediately below this note, Stainton (1882: 114) comments,

‘The notice of the *habits* of this larva given above is extremely interesting. Madame Lienig’s description (Isis, 1846, p. 292) says nothing of the habits; she gives the same food-plant, *birch*, but she describes the young larva as white, with hardly a tinge of greenish, and the more adult larva as dull whitish. It is not till *some time before pupation* that she says it is reddish-brown, with the white incisions of the segments.’

Meyrick (1895: 610; [1928]: 644–645) gives a reduced version of Richardson’s account,

‘Larva pinkish-brown, head and plate of 2 black’; in the earlier publication he says ‘in rolled leaves of birch’ and in the latter simply gives ‘on birch’.

Subsequently *Corylus avellana* L. was added as a foodplant by Ford (1949: 107).

Heckford & Langmaid (1991: 15, 21) published a larval description based on one larva feeding on *Corylus avellana*. This differed in body colour from

Richardson's description in that it was bright green only becoming suffused pinkish brown shortly before pupation. This account was followed by Langmaid (2002b: 226).

In 2008 I found two larvae at Dawlish Warren, Devon, England (V.C. 3) on 30 May, about half grown, and two larvae near Kinlochewe, Wester Ross, Scotland (V.C. 105) on 19 June, probably in their final instar, all in spinnings on *Betula pendula* Roth. The bodies of all the larvae were green when found and remained this colour until shortly before pupation when they became pinkish brown. Moths were reared from the larvae from Kinlochewe but only hymenopterous parasitoids resulted from those from Dawlish Warren. It was clear from my observations of all four larvae that the description given in 1991 was incomplete, especially in not mentioning that the colour of thoracic segment 1 is quite different from the colour of the rest of the body, and so I set out a fuller account.

Description

Larva. *Final instar.* Head and prothoracic plate black, the latter with a very fine white medial division; body pale, or very pale, green or whitish green, except thoracic segment 1 which is dull plum; pinacula on thoracic segment 1 comparatively large and elongate, very dark brown or blackish, remainder comparatively small and concolorous with body but with a dark brown or blackish brown area surrounding the base of the seta; setae black from base to about half their length, remainder colourless except those on abdominal segments 8–10 which are black throughout their length and conspicuous, especially those on segment 10 which appear to be longer than the others; peritremes of spiracles black; anal plate concolorous with body with some dull greyish green marks; thoracic legs black or dark grey above, becoming pale greenish below; ventral and anal prolegs concolorous with body, crochets reddish brown.

I am puzzled as to why Richardson describes the body colour of the larvae as pinkish brown and not white, whitish or green if they were not about to pupate.

One possibility is that the larva has two colour forms: pinkish brown or green, the latter becoming pinkish brown before pupation. The larvae of several species of *Macrolepidoptera* have two colour forms, usually green and brown, and the bodies of several species of *Lepidoptera* change colour to pink, pinkish brown, brown or reddish shortly before pupation, but I have not noticed any species of *Microlepidoptera* to have a larva with two colour forms.

Another possibility is that all the larvae that Richardson collected were about to pupate. This seems unlikely in view of his account of the larva eating about half a leaf and then proceeding to another leaf.

A third possibility is that the larva that his wife found was about to pupate, that he made his description from this one and did not notice the colour of the other larvae. Although it is clear that he noted that the feeding behaviour was for a larva to move from one leaf to another, perhaps he did not see this happen and when the larvae were in rolled leaves all he saw were their heads and thoracic plates and assumed their bodies were the colour of the one his wife



Figs 7, 8. Larvae of *Pyrausta cingulata* (Linnaeus, 1758).

Photos: R. J. Heckford



Photo: R. J. Heckford

Fig. 9. Larva of *Pyrausta cingulata* (Linnaeus, 1758).

had found. Unless and until further larvae are found with a pinkish brown body colour in, at least, their penultimate instar, I think this is the more likely explanation for Richardson's description.

Finally, although Richardson says that he 'bred this from bramble' he does not say that he found larvae feeding on this. I am not aware of anyone subsequently recording larvae on this plant. It seems more likely that he collected some bramble growing near either *Betula* species or *Corylus avellana* amongst which one or more larvae had pupated.

***Pyrausta cingulata* (Linnaeus, 1758) (Pyrallidae)**

Stainton (1867: 33) appears to have been the first to provide an account of the larva in the British literature, and this was a summary of part of a paper by Heyden (1861: 31–32). Heyden found larvae at Mombach near Mayence, now Mainz, Germany, in the middle of September on *Salvia pratensis* L., usually under leaves lying flat on the ground, gnawing these from the underside resulting in transparent spots on the upper surface, but sometimes on a higher leaf which was rather spun together. He says that its web, into which the larva retreats when disturbed, is generally found near one of the leaves amongst moss and dead leaves, and there are usually rather large heaps of black frass near these. He observed that the larva overwinters in a rather large, grey-

brown, papery cocoon and changes to a pupa in the spring. Stainton makes it clear that in order to save space he does not set out the larval description given by Heyden.

Although *Salvia pratensis* is a very local and uncommon plant in the British Isles and *Pyrausta cingulata* occurs far more widely than the distribution of this plant, nevertheless this was the only foodplant given in the British literature thereafter until Goater (1986: 69–70) cast doubt on this as a British foodplant.

Barrett (1904: 176) appears to have been the first to give a description of the larva in the British literature, and he attributes this to Hofmann, without any citation. I assume that he is referring to *Die Kleinschmetterlingsraupen* published in 1875, where a larval description and foodplant, *Salvia pratensis*, are given on p. 4 and where it is made clear that the information is derived from p. 31 of *Entomologische Zeitung* 1861, although Heyden's name is not mentioned. Barrett repeats, almost verbatim, Heyden's account of the life history as set out by Stainton. Barrett says that Hofmann describes the larva as spindle-shaped with a glossy yellow head spotted darker and a yellowish grey body with glossy black raised dots on which are small hairs.

Meyrick ([1928]: 429) does not describe the larva but says that it is in a web beneath the lower leaves of *Salvia pratensis*.

Beirne (1954: 156–157) more or less repeats the information provided by Barrett, without giving any attribution.

Goater (1986: 69–70) gives no larval description of this or any other species. He says that *Salvia pratensis* is cited as the foodplant by most text books on the authority of Heyden according to Barrett, but notes that this is unlikely to be the normal foodplant in the British Isles, where the moth appears to be associated with *Thymus* sp. Goater states that it was not known whether the larva had been reared in the British Isles. From enquiries that I have made, including from Mr A. M. Davis, Organiser of the Pyralid Recording Scheme, and Mr M. S. Parsons, of Butterfly Conservation, I cannot trace that the larva has been found in the British Isles before 2007, or if it has that any published account has appeared.

Emmet (1988: 215–216) gives *Thymus drucei* Ronn. (= *Thymus polytrichus* A. Kerner ex Borbas) as the foodplant, and possibly also *Salvia pratensis*. Later, however, he cites only *Thymus praecox* (= *Thymus polytrichus*) (Emmet, 1991: 172–173). Presumably this was because of Goater's comments no doubt supplemented by Emmet's own observations and discussions with colleagues.

On 4 and 26 August 2007 I visited the east coast of the Lizard peninsula, Cornwall, England (V.C. 1), an area with thin soils overlaying serpentine rock. *Salvia pratensis* does not occur in Cornwall but *Thymus polytrichus* does and is comparatively common on the Lizard peninsula. I collected 18 Pyraustine larvae in slight silken spinings amongst *Thymus polytrichus* growing over exposed areas of rock or compacted areas of bare soil. They did not appear to create any webs into which they retreated when disturbed, or piles of frass. The larvae were not easy to find and appeared to occur low down within the foodplant. However, they must be comparatively easy for hymenopterous parasitoids to locate because in due course nine each produced one parasitoid. The remaining larvae spun comparatively thick papery cocoons the following

month. The contents of some could be observed because several were spun against the side of the plastic containers within which I kept them. From this it was clear, as noted by Heyden, that the larvae do not then change to pupae but overwinter in that stage. Unfortunately by late winter/early spring it was also clear that most had died, despite being kept outside. On 17 May 2008 I brought indoors a cocoon that had been made by 6 September 2007 by a larva collected on 27 August. This had not been spun against a side of the container and so the contents were not visible. On opening it that day I found that the larva was still alive, much to my surprise. As will be seen from the description given below the body colour of the final instar is either purplish grey or reddish purple, but the body colour of this hibernating larva was dull green. I assumed that as I had opened the cocoon the larva would not survive but a moth emerged on 19 August 2008, thus confirming my assumption that the larvae I had found were this species.

In captivity I offered the larvae *Thymus* spp., the leaves of *Salvia verbenaca* L. and a garden *Salvia*, and all were accepted.

Description

Larva. *Early instars.* These appeared to be the same as the final instar described below except that the body colour is more variable. One larva 3 mm long had thoracic segments 2 and 3 greenish and the abdominal segments greenish yellow with a pale greyish purple dorsal line. One larva 4 mm long (Fig. 7) had thoracic segments 2 and 3 greenish yellow and the abdominal segments pale yellow-brown with a darker dorsal line. One larva 5 mm long had thoracic segments 2 and 3 greyish purple and the abdominal segments brighter reddish purple than in the final instar. One larva 6 mm long (Fig. 8) had thoracic segments 2 and 3 greenish and the abdominal segments dull reddish purple with the areas around the pinacula grey and a dull reddish purple dorsal line. I was not able to observe when the body colour of these larvae changed to the colour of the final instar, partly because some produced hymenopterous parasitoid larvae before that instar.

Final instar (Fig. 9). 11–12 mm long. Head: labrum yellowish brown becoming darker towards all edges, anterior edge with black mark medially, clypeus white, epicranium yellowish white with yellowish brown or black marks and edged black laterally, adfrontal sutures honey brown, stemmata black; prothoracic plate yellowish brown with several black spots and marks and a faint, white medial division; body dull purplish grey or dull reddish purple with intersegmental divisions dark grey or dull reddish brown, both of these colour forms with an indistinct, sometimes obsolete, grey dorsal line, and a very indistinct yellowish white subspiracular line, or dull reddish brown without any apparent lines; pinacula conspicuous, some slightly edged pale yellowish white, large, slightly shiny and appearing black, but under magnification the dorsal and lateral pinacula appear very dark grey with a black area surrounding a dark honey coloured seta, sublateral and ventral pinacula pale grey with a similar black area; peritremes of spiracles black; anal plate comparatively large, pale grey with black marks; thoracic legs with femur dark grey on the upper surface, pale greyish white on the lower surface, tibia pale greyish white, posteriorly dark grey on the upper surface, tarsus dark honey brown, claw black; ventral and anal prolegs concolourous with body, planta white, crochets reddish brown. Body changes to dull green at some stage whilst overwintering.

Pupa. Undescribed, not extruded on emergence, within a thick, papery, brown cocoon. Exuviae reddish brown.

Hymenopterous parasitoids reared from larva of *Pyrausta cingulata*

Apanteles obscurus (Nees, 1834) (Braconidae, Microgasterinae) 2 ♂, 7 ♀. A known parasitoid of certain Pyralid species including *Pyrausta purpuralis* (Linnaeus, 1758).

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NOTES AND OBSERVATIONS

***Endothenia oblongana* (Haworth, 1811) (Lepidoptera: Tortricidae)
reared from a rootstock of *Plantago lanceolata* L.**

In 2009 a male *Endothenia oblongana* (Haworth, 1811) emerged from a rootstock of *Plantago lanceolata* L. collected the previous autumn in Devon. This appears to be the first record of the species being reared in the British Isles.

As far as I can trace, the first indication in the British literature of a larval foodplant was given by Barrett (1872, *The Entomologist's Monthly Magazine* 9: 128), under *Antiithesia sellana* Hübner, in a series of notes on the Tortricidae. He states that 'Mr. Doubleday tells me that the larva feeds in heads of *Centaurea nigra*: he also points out that this species may readily be separated from its nearest allies (*gentiana* and *oblongana*) by the peculiar round apex of its short anterior wings. This is very evident in specimens communicated by him.'

The fact that Barrett's '*sellana*' differed from '*oblongana*' would suggest that the larva Doubleday found in heads of *Centaurea nigra* was not that of what is now known as *Endothenia oblongana*. Consideration of other parts of the note shows that Barrett was indeed referring to this species. Barrett makes clear at the start of his paper that it was written as a result of the publication, in 1871, of Staudinger & Wocke's *Catalog der Lepidopteren des europaeischen Faunengebiets*. He described this Catalogue (1872, *loc. cit.* 9: 124) as causing such a revolution in the existing nomenclature that a good deal of confusion was likely to be caused in some groups, commenting that this was especially so with the Tortrices. Accordingly, Barrett stated that he thought that a few notes on the changes of nomenclature would be of interest. Thus, the primary purpose of Barrett's note was to set out those nomenclatural changes, but occasionally he also added information about the biology of certain species.

Staudinger & Wocke (1871, *loc. cit.*: 248) placed the following species, amongst others, in the genus *Penthina*: *oblongana* Haworth, *sellana* Hübner and *gentiana* Hübner. These are now known respectively as *Endothenia marginana* (Haworth, 1811), *E. oblongana* (Haworth, 1811) and *E. gentianaeana* (Hübner, 1799).

Barrett (1872, *loc. cit.* 9: 127) states that Wocke, who dealt with the Microlepidoptera section of *Catalog der Lepidopteren des europaeischen Faunengebiets*, changed '*Antiithesia marginana*, Haw.' to '*oblongana*, Haw., because Haworth's description of *oblongana* (the ♀) is placed before that of *marginana* (the ♂)'. In fact, as indicated above, Staudinger & Wocke place both species in the genus *Penthina* but Barrett comments (1872, *loc. cit.* 9: 124) that he could not agree with Wocke's new arrangement because of the difficulty he felt in adopting such a genus as *Penthina*.

Barrett (1872, *loc. cit.* 9: 127) notes that the larval foodplant of *Antiithesia oblongana*, now *Endothenia marginana*, was likely to be various Compositae, thereby showing that the larva of *Endothenia marginana* was unknown in the British Isles at that date.

In view of the comments above, it is clear that Barrett's note on *Antiithesia sellana* should be read as referring to *Endothenia oblongana* (Haworth, 1811);

the '*oblongana*' that he referred to in parenthesis on p. 128 of his note now being known as *Endothenia marginana*.

Subsequently, under *Penthina sellana* Hübner, Barrett states (1905, *The Lepidoptera of the British Islands* 10: 373–374) that the larva is apparently undescribed and doubtfully known, that the late Mr Doubleday informed him that it feeds in seed heads of *Centaurea nigra* and that W. Farren had seen the moth apparently depositing ova on leaves of *Plantago lanceolata*. He adds that Hofmann states that he had reared it from seeds of *Pedicularis*. Although Barrett gives no citation, I assume that he is referring to E. Hofmann's *Die Kleinschmetterlingsraupen* published in 1875.

Bradley, Tremewan & Smith (1979, *British Tortricoid Moths*, Tortricidae: Olethreutinae: 57–58) give a larval description of *Endothenia oblongana* based on Swatschek (1958, *Abhandlungen zur Larvalsystematik der Insekten* 3: 198) as follows: head, prothoracic plate and thoracic legs dark brown, anal plate somewhat lighter; abdomen lemon-yellow. They state that little is known about the larval habits in the British Isles, but the foodplant is believed to be *Centaurea nigra*. They note that in continental Europe it is reported to be polyphagous and the larva has been recorded on '*Cirsium oleraceum*, *C. palustre*, *Dipsacus*, *Galeopsis*, *Odontites verna*, *Verbascum*, *Scabiosa*, *Stachys* and *Plantago*, feeding in the roots and rootstocks.' They give the larval period as September to May.

Swatschek (1958, *loc. cit.*: 198) based his description on preserved larvae found by Disqué at Speyer in the Rhine valley, Germany, on 30 March 1904 and 5 November 1909 in the rootstock of *Plantago*, species not stated.

Emmet (1991, in Emmet & Heath (Eds), *The Moths and Butterflies of Great Britain and Ireland* 7(2): 152–153) clearly had doubts about the foodplant because he gives '? *Centaurea nigra*; roots'.

I am not aware that any further information about the life history has been published in the British literature. Whether the larvae that Doubleday found in heads of *Centaurea nigra* were really those of *Endothenia oblongana* may never be known, but if he reared a male then it should have been obvious from the hindwing whether it was that species or *Endothenia marginana*. In any event, I consider that Emmet was right to question whether *Centaurea nigra* is a foodplant.

In their review of this species in The Netherlands, Koster & Nieuwerkerken (1998, *Entomologische Berichten* 58: 145–152) record that in the spring they collected some plants of *Plantago lanceolata*, which was very abundant where they had taken *Endothenia oblongana* at light. They found some larvae, possibly tortricoid, but failed to rear anything.

On 11 October 2008 I was searching rootstocks of *Plantago lanceolata* at Heybrook Bay, Devon (V.C. 3) in the hope of finding larvae of *Homoeosoma sinuella* (Fabricius, 1794) by looking at plants with slightly withered or stunted leaves. I found only one rootstock with a larva. The top of the plant broke off quite easily to reveal a comparatively small larva that was not within a narrow tunnel about the breadth of the larva, as is often the case with stem- or root-feeding larvae, but inside a chamber that was probably at least twice the breadth and length of the larva. I was not able to make a full larval description

and only noted that the head and prothoracic plate were dark brown and the body whitish with concolorous pinacula. Within a few hours it had closed with silk the end that had broken open and the spinning was so thick that I could not see through it to observe when the larva pupated. The rootstock was overwintered in a container outdoors in a shed and brought indoors in late March 2009. A male *Endothenia oblongana* emerged on 24 April. The yellowish brown exuviae were extruded to about half their length through the sealed silken top of the rootstock.

Interestingly, *Endothenia marginana* has been reared from the seed heads of *Plantago lanceolata* (www.ukmoths.org.uk, site visited May 2010), thus showing that the larvae of two closely related species utilize either 'end' of this plant.

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