

## Summer Fruit Tortrix Moth *Adoxophyes orana* and Light Brown Apple Moth *Epiphyas postvittana*.

Roger Umpelby.

As a 'retired' applied entomologist, Tony Simpson's article on the first record of *Adoxophyes orana* in VC37 (Simpson 2018) was of particular interest to me as I spent many years using pheromone traps to monitor populations of this species (01). This monitoring was in relation to its impact as a top fruit pest. The monitoring of horticultural pest species with sex pheromone traps started in the UK in the early 1970s with apple being the main crop involved, *A. orana* was one of the three species initially studied (Carden 1987).

Of all the many 'pest' moth species I monitored over many years on a range of horticultural crops, *A. orana* and *Epiphyas postvittana* interested me most; why? – because of their strange distribution in the UK, including in Worcestershire. Both species, being horticultural pests, are likely to be moved regularly around the UK on plant material from nurseries, and could therefore be expected to become widespread very quickly. However their distribution histories tell different stories.



01. male *Adoxophyes orana* on the sticky base of a pheromone trap. Roger Umpelby.

### *Adoxophyes orana* (Fischer von Röslerstamm)

According to Massee (1954), the caterpillars of this species was first described in Holland in about 1834 on birch (*Betula* spp.), but it was not until 1940 that its caterpillars were found feeding in apple orchards in Belgium. The first UK record of the caterpillar in a commercial apple orchard was in 1950 in north-east Kent. Over the next few years it spread throughout Kent and East Sussex. By the 1970s it had also become a pest in apple orchards throughout East Anglia; and it remains to this day to be a major pest of apples throughout East and South-east England. Today, if you include cider apples, more than half of the area of apples of the UK is in the west of England, so what about *A. orana* here? Effectively it is not, and has never been, a pest of commercial apple orchards in the western half of the UK.

The reason for this remains a complete mystery because, anticipating the arrival of this species, pheromone trapping has been done annually in several western counties, including Worcestershire, since the mid-1980s and, with one notable exception, no *A. orana* have been positively identified in traps west of Hampshire. Although the pheromone for *A. orana* is effective, and catches of well over 50 per week are not uncommon in the south-east, the pheromone does attract an unusually high number of other 'contaminant' species. These contaminants result in frequent mis-identification, particularly in areas where *A. orana* is not present. Image 01 shows a male *A. orana* on the sticky base of a trap, and image 02 shows one of the main contaminant species, the Middle-barred Minor *Oligia fasciuncula* on the *A. orana* trap base.



02. Male *Oligia fasciuncula* on *A. orana* pheromone trap. Roger Umpelby.

Apart from the usual natural spread westwards and northwards of most new species which are first recorded in the south-east of England, the frequent national and international movement of nursery-raised apple trees in theory should speed the spread of *A. orana* to new areas. This is because in the autumn, the second or third instars of the caterpillar spin hibernacula to over-winter in; these are often formed on the woody parts of the tree, including on nursery trees (Alford 1984). Although most nursery cider apple trees are produced in areas where *A. orana* is not present, desert and culinary varieties are most frequently sourced from areas and countries where *A. orana* is widespread and very common.

What about 'the notable exception' mentioned above? In 2014 I was asked to visit a commercial organic apple orchard in north-western Gloucestershire, to advise on caterpillar control. The grower ran pheromone traps for *A. orana* and the other two main caterpillar apple pests, Codling Moth *Cydia pomonella*, and Fruit Tree Tortrix Moth *Archips podana*. To my surprise he said he was getting moderate to high catches of *A. orana*, and I was able to confirm his identification was correct. After nearly 40 years of anticipating its arrival in this part of the UK, at last confirmation. I should not have been pleased, but I sort of was as it was the first catch I had seen in over 30 years since working in Kent! So six years on since this confirmation, what has happened? Not much as, although the original infestation continues each year, there have been no further confirmed infestations in other convention, organic or derelict orchards in the area or in the west of England, so the puzzle remains. Perhaps they have recently migrated 60km. to Eastham and nearby parts of north Worcestershire.

### *Epiphyas postvittana* (Walker)

This species is native to Australia and was first recorded in the UK in 1927 near Reading, and in 1933 it was reared from caterpillars found on apple fruit imported from New Zealand (Massee 1954). In 1936 the first recorded breeding colonies of it were found on nursery stock in Cornwall (Alford 1984).

Over the next 40+ years, apart from occasional records elsewhere, *E. postvittana* was recorded only in Cornwall and Devon. From the early 1980s things began to change with regular and increasing records from parts of Wales, with the occasional record from The Wirral and Liverpool areas and one from Herefordshire in 1988. The distribution started to change rapidly in the early 1990s with several records from Dorset and the Isle of Wight, followed by records from the London area from 1995. Records started to be confirmed from 1998 in East Anglia. (NBN Atlas occurrence download). Today this species is found throughout the UK and is common in most of England and Wales (Butterfly Conservation website).



Tony Simpson reports that his first record in Worcestershire (VC37) was in August 1997 in Wyre Forest, with his second from The Knapp in 1999. He confirms that from 2005 this species became much more widespread. (Simpson 2020).

*Epiphyas postvittana* is a major pest of apples in Australia and New Zealand, but interestingly in the UK, although recorded in apples, it rarely, if ever, causes economic crop damage in apple orchards. However through the late 1990s *E. postvittana* became an increasingly important pest of nursery stock in southern and central England. Unlike many Tortricid moth pest species, the male and female moths are very different and the female is much larger (03 and 04).



03. Male *Epiphyas postvittana* on pheromone trap. Roger Umpelby.

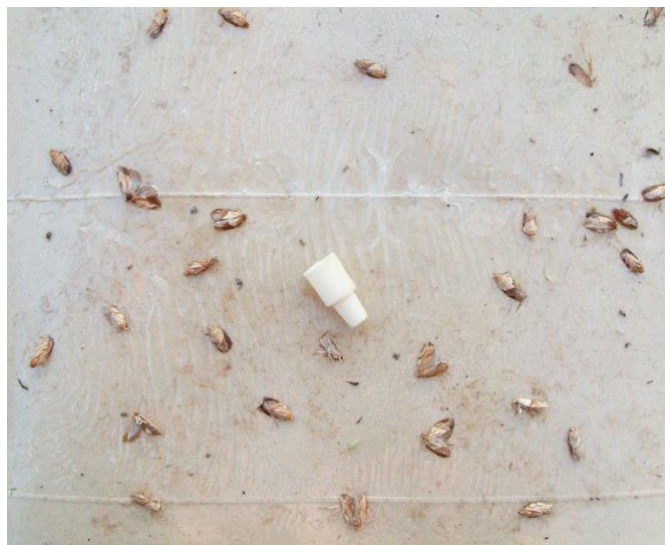


04. Female *Epiphyas postvittana*. Roger Umpelby.

In 2002 a new and highly effective pheromone for *E. postvittana* became commercially available and regular and widespread monitoring started to enable crop damage prediction and more accurate timing of any necessary control measures. In Worcestershire in 2002 up to a maximum of five moths per week were recorded in traps at several sites, and subsequently each year catches rose steadily until a peak of 84 moths in one week in 2008. Numbers trapped after 2010, a really bitter early winter, fell sharply (10 in 2011) and in each year since weekly peaks have remained between ten and 25. Unlike the pheromone for *A. orana*, the pheromone for *E. postvittana* usually attracts few contaminants, as illustrated in image 05. However in some areas *Pyrausta aurata*, sometimes called a Mint Moth, is a regular contaminant (06 and 07).

#### Any answers?

The sudden spread of *E. postvittana* from south-west England after so many years is likely to be due to subtle changes in temperature, so is likely to be due to our warming climate. Conversely however, the reason for the lack of spread of *A. orana* into and through Worcestershire is still unexplained; ideas most welcome!



05. *Epiphyas postvittana* males on pheromone trap. Roger Umpelby.



06. *Pyrausta aurata* on *E. postvittana* pheromone trap. Roger Umpelby.

#### References

- Alford, D. V. 1984. *A colour atlas of fruit pests*. Wolfe Publishing Ltd., London
- Butterfly Conservation website. <https://butterfly-conservation.org/moths/light-brown-apple-moth>
- Carden, P.W. 1987. *Supervised control of apple pests in southern England*. *Crop Protection* 6(4):234-243
- Massee, A.M. 1954. *The pests of fruit and hops*. Crosby Lockwood & Son Ltd., London
- NBN Atlas occurrence download at <http://nbnatlas.org>. Accessed 06-11-2020.
- Simpson, T. 2018. *Summer Fruit Tortrix new to Worcestershire VC37*. *Worcestershire Record* 45:24
- Simpson, T. 2020. Private communication

#### Images

- 01. male *Adoxophyes orana* on the sticky base of a pheromone trap. Roger Umpelby.
- 02. Male *Oligia fasciuncula* on *A. orana* pheromone trap. Roger Umpelby.
- 03. Male *Epiphyas postvittana* on pheromone trap. Roger Umpelby.

04. Female *Epiphyas postvittana*. Roger Umpelby.
05. *Epiphyas postvittana* males on pheromone trap. Roger Umpelby.
06. *Pyrausta aurata* on *E. postvittana* pheromone trap.  
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