

**The Cinnabar Moth (*Tyria jacobaeae* L., 1758) (Lepidoptera, Erebidae) and historic agro-ecosystems: questions answered, questions posed**

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**Introduction**

Recently it was suggested (Whitehead 2017) that arable and grassland populations of the Cinnabar Moth *Tyria jacobaeae* . may be ecologically and bionomically differentiated. Numbers of Groundsel-feeding larvae from Worcestershire’s historic agroecosystems were found to be few in relation to the prolific larvae observed on grassland Ragwort *Senecio jacobaea* L. During 2018 interesting new evidence was gleaned that threw further light on this matter.

**Discussion**

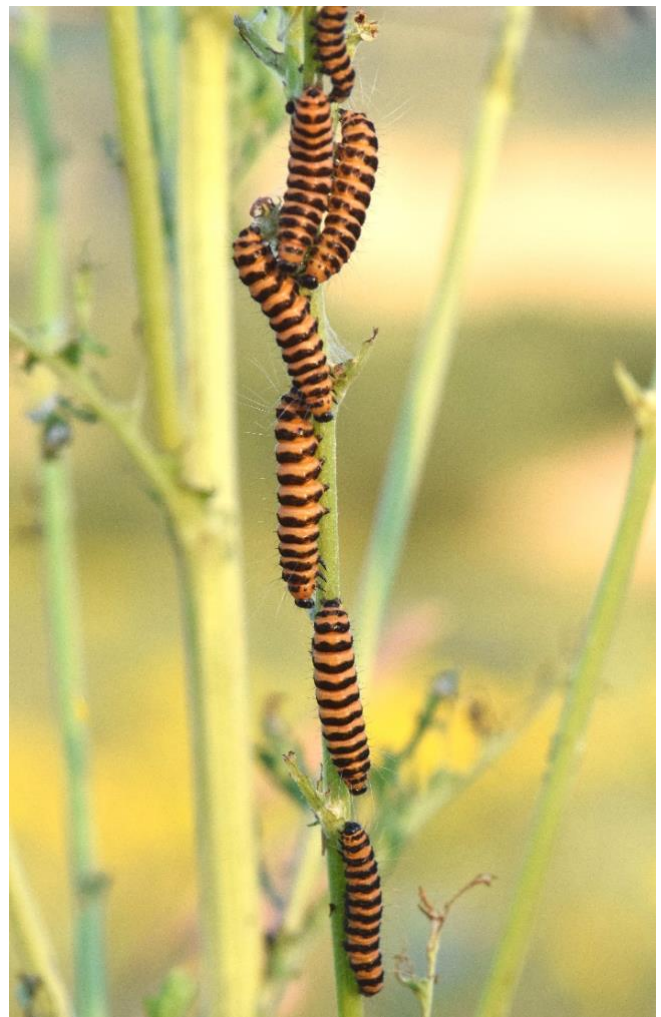
On 19 June 2018 a female *T. jacobaeae* was observed ovipositing on Groundsel *Senecio vulgaris* L. growing on a remanié fragment of the town’s once extensive medieval open fields in the Greenhill area of Evesham (SP04 54 m altitude). The plant was only 65 mm high and remarkably the moth laid 72 eggs under one leaf. On 2 July 2018 it was found that 46 of the eggs had hatched but that only 12 larvae, each 3 mm long, remained on the plant. On 11 July the 12 larvae were reduced to one; this was flaccid, about 9 mm long and had consumed the entire plant including its main stem. At 11.28 hrs on that day it abandoned the plant and began to move across the site apparently in the wandering phase mentioned previously. I intervened and placed the larvae on a second plant of Groundsel which was also eventually consumed and then abandoned by it (01).



01. Having consumed most of the Groundsel foliage the last remaining underfed larva of *T. jacobaeae* at Evesham consumes the flowers on 5 July 2018. The larvae not infrequently web their food plants.

This observation raises some interesting questions:

1. There is a significant mismatch between the number of eggs laid and the ability of the host plant to support the equivalent number of larvae. Might this imply that not enough time has yet elapsed, even if it is considerable, for *T. jacobaeae* to adapt successfully to the agri-environment?
2. Only 63% of the eggs that were laid actually hatched. Is this a manifestation of an agroecosystem population subject to recent generalised negative selection pressure creating reduced population viability?
3. What became of the 34 larvae that absented themselves in the period up to 2 July 2018? Where they consumed by the other larvae as a recognised competition-limiting strategy?
4. Between 2 July when the larvae were found to be 3 mm long, and 11 July the remaining 12 larvae were finally reduced to one on the plant. What became of the other 11 larvae?



02. Well-grown larvae of *Tyria jacobaeae* on grassland Ragwort, Birlingham, Worcestershire, 14 July 2018.

If Groundsel-feeding larvae travel habitually over the land surface (Whitehead, 2017) they are unlikely to survive everywhere; in this instance there were only two Groundsel plants within a 40 metre radius. Also in this instance 1.38% of the total number of eggs laid produced a larva that reached maturity, evidently as an extreme example of the density-dependent larval mortality cited by Dempster & Lakhani (1979). If typical, such a sequence of events may explain why larvae of *T. jacobaeae* are found so rarely on Groundsel on traditional agroecosystems, but it does not explain the persistence of the moth at some sites where the populations can scarcely be described as fecund and therefore may be of conservation interest.

In Roman and medieval agriculture, where fallows and infields were fertilised organically from livestock, Groundsel may have proliferated more than it does now, with the potential to achieve dominance. It is observed that all of the agricultural sites supporting *T. jacobaeae* in Worcestershire up to now have either Roman or possibly earlier, or medieval origins, and are of considerable conservation interest (Whitehead, 2016). It may simply be that increasingly sanitised arable agriculture is not conducive to the fortunes of the Cinnabar Moth.

More than 7000 larvae of *T. jacobaeae* were on floodplain grassland at Birlingham, Worcestershire, (SO 94 13 m altitude) during July 2018 (02) suggesting that the regional status of grassland *T. jacobaeae* causes no current concerns (Fox *et al.*, 2013).

#### References

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#### Images

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