

NOTES ON THE BIOLOGY OF TWO BRITISH OPHIONINAE (HYMENOPTERA: ICHNEUMONIDAE)

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ABSTRACT

Unequivocal rearing data are given for *Enicospilus adustus* (from *Sideridis turbida*) in England and *Eremotylus marginatus* (from *Asteroscopus sphinx*) in Germany, with a consideration of their British distributions. Barcode (COI sequence) data are given for *E. marginatus*.

INTRODUCTION

Although Ophioninae are among the largest ichneumonids in Britain and are familiar to most entomologists, they are relatively infrequently reared. For several of the British species, even some quite common ones, little or nothing is known of their host relations (cf. Shaw & Broad, 2023). In part this is because most (perhaps all) species parasitise late-instar larvae, and for the majority these are species of Noctuidae, possibly even late into their final instars, which are not often easily found or commonly collected in numbers. Recently, clear host relations have been uncovered for the first time for two British species, *Enicospilus adustus* (Haller) and *Eremotylus marginatus* (Jurine), as recorded here. Although the first record is from a straightforward rearing in England, the information for *E. marginatus* derives from a DNA determination of a parasitoid larva from a host collected in Germany.

REARINGS AND DISCUSSION

Enicospilus adustus

A male of this species was sent to me by Barry Henwood, reared from a larva of the noctuid *Sideridis turbida* (Esper) collected by him at Loe Bar, Cornwall on 5.viii.2020. The date of emergence is not recorded (but was almost certainly in 2021). The parasitoid cocoon, though not the host remains, is present and the specimen is deposited in the National Museums of Scotland (NMS). Adult *S. turbida* were reared from larvae determined by BH as that species on both this and previous occasions from Loe Bar, and the host determination is beyond doubt. Broad & Shaw (2016) were able to cite only one reared specimen, but its host is unclear: supposedly either *Blepharita* (now *Minotype*) *adusta* (Esper) or *Lacanobia contigua* ([Dennis & Schiffermüller]), mis-cited as *L. oleracea* (Linnaeus). The present rearing represents the first reliable host record for *E. adustus* (especially taking into account the confused application of names in *Enicospilus*, as discussed by Broad & Shaw (2016)) and, although not a perfect fit, the British distribution data for this widespread but uncommon parasitoid given by Broad & Shaw (2016) is a fairly good match to that of the much-declined *S. turbida* given by Randle *et al.* (2019). However, *E. adustus* is recorded as a common and widespread species in the southern and central parts of Sweden, occurring in a wide range of habitats (Johansson, 2018), which suggests that it may have a larger host repertoire. It should be noted that Haller's type series was not reared, and the name *adustus* does not relate to the name of a host.

Eremotylus marginatus

While on an insect-collecting and camping holiday for the period 19.v–1.vi.2023 in Thuringia (Germany) in a pleasant mix of mainly deciduous woodland and meadows cut for hay at Harztor, I was pleased to catch two males of *Eremotylus marginatus* flying in daytime (as the males of this relatively large and dark ophionine often do) on 23 and 25.v.2023 (both specimens in NMS). I also collected from *Quercus petraea* three final instars of the large noctuid *Asteroscopus sphinx* (Hufnagel), which had to be reared singly (in 7.5 × 2.5 cm corked glass tubes) as they are potentially cannibalistic. One produced a brood of *Glyptapanteles fulvipes* (Haliday) (Braconidae: Microgastrinae), one died of unknown causes, and the third became prepupal on 29.v.2023, the day after it was collected. It was transferred in situ to a detached shaded and open garden shed in Edinburgh, and on 14.vi.2023 it was seen that a large parasitoid larva had erupted from the prepupa and started to spin its cocoon – clearly Ophioninae, but a large one even for that subfamily, which encouraged my hunch that it would turn out to be *E. marginatus*. Unfortunately, nothing emerged from it the following May and, as it seemed likely that it had died as an adult in the cocoon, on 4.vii.2024 the cocoon was opened; a bad mistake, as it contained a living larva that had not yet defecated and thus had not yet committed to pupation. Presumably, as had been found to occasionally happen in *Ophion minutus* Kreiechbauer (Shaw & Broad, 2023), it would have lain over for (at least) another year. Although unusual for temperate ichneumonids, some species that make extremely dense and finely-spun subterranean cocoons can do this, the “decision” to commit to emerging in the following year probably involving defecation in late summer, as seen in the acaenitine ichneumonid *Aceanitus dubitator* (Shaw & Wahl, 1989). At any rate there was no realistic prospect of rearing the exposed larva, so it was preserved in ethanol and a portion submitted for CO1 sequencing (using standard insect primers and nanopore sequencing) by the Natural History Museum UK (NHMUK), along with a leg of the male *E. marginatus* collected at Harztor on 23.v.2023. Both yielded identical CO1 sequences in the barcode region, demonstrating unequivocally that the parasitoid of *A. sphinx* was indeed *E. marginatus*:

Larva (2 identical replicates)

> NHMUK016038419_all.fa;658;13;ambs=0;estgaps=0

AATTTTATATTTTATTTTCGGTATATGAGCCGGAATATTAGGTTCTT-
CAATAAGTTTAAATTATTCGAATAGAATTAGGAAATCCTGGATATT-
TAATTAATAATGATCAAATTTATAATTCAATTATTACATCACATGCATT-
TATTATAATTTTTTTTATAGTAATACCTATTATAAATTGGTGGAATTTG-
GAAACTGAATAATTCCATTAATATTAGGAGCTCCAGATATAGCTTTCC-
CACGAATAAATAATATAAGTTTTTGATTATTACCACCTTCAT-
TAAATTTTTTAAATTATAAGAAGAATCTTAAATAATGGAGTAGGAA-
CAGGTTGAACAGTTTACCCACCATTAATCAATTAATATTAATCATGAAG-
GAATATCATTAGATTTAGCTATTTTTTCCTTACATTTAGCTGGAATAT-
CATCTATTATAGGAGCAATTAACCTTCATTACAACATTATTAATA-
TAAAAAATATTAATATTTTATTTGAACAAATAACCCTATTTTCTTGAT-
CAATTTTAATTACCACAATTTTATTACTTTTAGCTGTCCAGTTTGTAG-
CAGGTGCTATTACTATACTTTTAACAGATCGAAATCTAAATA-
CATCTTTTTTTGACCCATCAGGAGGAGGAGACCCAATTTTATATCAA-
CATTTATTT

Adult (3 identical replicates)

> NHMUK016038420_all.fa;658;25;ambs = 0;estgaps = 0

AATTTTATATTTTATTTTCGGTATATGAGCCGGAATATTAGGTTCTT-
CAATAAGTTTAAATTATTCGAATAGAATTAGGAAATCCTGGATATT-
TAATTAATAATGATCAAATTTATAATTCAATTATTACATCACATGCATT-
TATTATAATTTTTTTTATAGTAATACCTATTATAATTGGTGGATTG-
GAAACTGAATAATTCATTAATATTAGGAGCTCCAGATATAGCTTTCC-
CACGAATAAATAATATAAGTTTTTTGATTATTACCACCTTCAT-
TAAATTTTTTAATTATAAGAAGAATCTTAAATAATGGAGTAGGAA-
CAGGTTGAACAGTTTACCCACCATTATCATTAAATATTAATCATGAAG-
GAATATCATTAGATTTAGCTATTTTTTCCTTACATTTAGCTGGAATAT-
CATCTATTATAGGAGCAATTAACCTTCATTACAACCTATTATTAATA-
TAAAAAATATTAATATTTTATTTTGAACAAATAACCCTATTTTCTTGAT-
CAATTTTAATTACCACAATTTTATTACTTTTAGCTGTCCCAGTTTTAG-
CAGGTGCTATTACTATACTTTTAACAGATCGAAATCTAAATA-
CATCTTTTTTTGACCCATCAGGAGGAGGAGACCCAATTTTATATCAA-
CATTTATTT

These sequences will be uploaded onto BOLD via the NHMUK system in due course.

De Gaulle (1908) lists, without comment or detail, *Scopelosoma satelittia* (now *Eupsilia transversa* (Hufnagel)) as a host for this parasitoid, but otherwise there appears to be nothing published on its biology. All 11 of the caterpillars of *E. transversa* that I found by general beating of trees (largely *Quercus petraea*) and shrubs (largely *Prunus spinosa*) at Harztor were less than half grown, but kept for rearing none the less (singly, in 7.5 cm 2.5 cm corked glass tubes, as they also tend to be cannibalistic). One produced a *Microplitis* sp. (Braconidae: Microgastrinae) and others died apparently unparasitized but, after about two more weeks of feeding and moulting, then a prolonged prepupal period, eventually five moths were reared. In addition to a slight phenological misfit (presuming that *E. marginatus* parasitises final instar hosts) *E. transversa* seems too small a noctuid to serve as host for such a large ichneumonid and De Gaulle's association seems improbable, or at least atypical. *Eremotylus marginatus* (Fig. 1) is a rather scarce and local species in



Fig. 1. Male *Enocospilus marginatus*, Monks Wood, Cambridgeshire. Photo: Gavin Broad.

Britain, but widely distributed in deciduous woodland in the south and midlands. It should not be confused with the similarly coloured but commoner *Ophion ventricosus* Gravenhorst (a parasitoid of the geometrid *Phigalia pilosaria* ([Denis & Schiffermüller]); cf. Shaw & Broad, 2023), which lacks the strong bend at the base of fore wing vein 2r&RS as it leaves the pterostigma (visible in Fig. 1 for *E. marginatus*). For what it is worth, while *Eupsilia transversa* is found more or less throughout Britain, *A. sphinx* is restricted to the southern half of Britain and characteristic of woodland habitats (Randle *et al.*, 2019), a closer fit to the distribution of the parasitoid.

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