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***Metatrichoniscoides celticus* Oliver & Trew, 1981 new for England (Isopoda: Oniscidea: Trichoniscidae)**

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Abstract

The elusive soil-dwelling woodlouse species *Metatrichoniscoides celticus* (Oliver & Trew, 1981) has been recorded for the first time in England. This discovery also marks the first recorded occurrence of *M. celticus* from a heavily synanthropic habitat, suggesting the species is much more widely distributed and can occupy a broader range of habitat types than previously thought. Revised overlapping habitat preferences with the morphologically similar *M. leydigii* complicates previous distribution records and throws some previously assumed records of female *M. celticus* into doubt.

Key words: Isopoda, Oniscidea, *Metatrichoniscoides celticus*, England, distribution, habitat.

Introduction

The trichoniscid *Metatrichoniscoides celticus* was described new to science by Oliver & Trew (1981) from a handful of coastal erosion banks underlain by limestone (within three contiguous hectads) in the Vale of Glamorgan, south Wales, between Ogmores-by-sea and St Donats. It was initially thought to be a supra-littoral species, being found under deeply embedded boulders on the upper shore where exposed humus-rich soil erodes from grassy or un-vegetated banks (Oliver & Trew, 1981; Harding & Sutton, 1985). However, Chater (1986) reports its occurrence at Crwbin some 7 km inland at 170 m a.s.l. beneath large partly embedded limestone boulders in stony soil in a disused limestone quarry, suggesting a much broader habitat preference. Targeted surveys undertaken between 2003 and 2007 relocated this species at its known coastal sites (John Harper, pers. comm. to SJG, data included within Gregory, 2009). More recently, targeted surveys at Ogmores-by-Sea have re-found the species with relative ease (albeit few individuals) in 2016 (C. Owen & M.G. Telfer, pers. comm. to SJG), 2017 (SJG, pers. obsv.) and 2018 (C. Owen, pers. comm. to SJG). However, *M. celticus* has remained a notoriously elusive woodlouse with no additional localities having been discovered since 1986.

Then in February 2019 the collection of a male specimen of *M. celticus* from Anglesey, north Wales (Mariandyrys NNR) is reported by Hughes (2019), which extends the known global range 170 km further north. These specimens were found under embedded limestone blocks in grassland some 0.8 km inland and at 100 m a.s.l. In addition, a female *Metatrichoniscoides* specimen, which may be conspecific, was collected from limestone grassland at Great Orme, Llandudno on the Welsh mainland 16 km to the east at 190 m a.s.l.

Here we report the discovery of *Metatrichoniscoides celticus* from a synanthropic site in south-west England some 60 km further east on the opposite side of the Bristol Channel.

***Metatrichoniscoides celticus* new to England**

On 10.x.2020 FA collected specimens of an unpigmented blind trichoniscid, less than 2 mm in length, from within the topsoil on an allotment in Horfield, Bristol (ST600763, VC34, 45 m a.s.l.). Macrophotographs were taken in-situ, followed by collection and preservation in 80% ethanol. Specimens were readily keyed to *Metatrichoniscoides* sp. by FA using Hopkin (1991), and a

macrophotograph was posted online to BMIG's Isopods and Myriapods of Britain and Ireland group (www.facebook.com/groups/407075766387553) by FA (Fig. 1). The image drew a lot of attention and subsequently FA forwarded the preserved specimens to SJG for species determination.



Figure 1: *Metatrichoniscoides celticus* immature live specimen from Horfield Allotments.
Live macrophotograph in-situ (Image © Frank Ashwood).

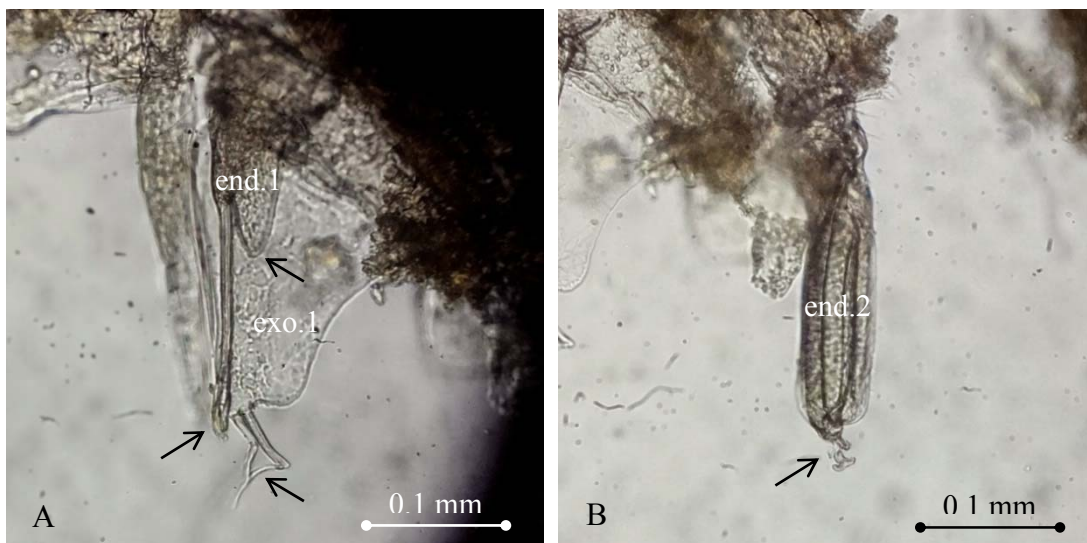


Figure 2: *Metatrichoniscoides celticus* male from Horfield Allotments.
A) Pleopod 1, endopodite 1 (end.1) and exopodite 1 (exo.1); B) Endopodite 2 (end.2).

Given the synanthropic habitat (worked allotments – see Fig. 3A) these specimens were assumed to be *Metatrichoniscoides leydigii* (Weber), however upon dissection of a male specimen it proved to be *M. celticus*. The shape and form of pleopods 1 and 2 matched those for *M. celticus* figured in Oliver & Meehan (1993, p. 33, fig. 8B). Pleopod 1 (Fig. 2A) had the base of the endopodite bearing a well-defined triangular posterior projection (arrowed) and the distal tip was swollen and bearing a series of short bristles (arrowed). The exopodite was terminated with two distal processes ('tails') of uneven lengths (arrowed). The endopodite of pleopod 2 (Fig. 2B) is terminated in hooked projections (arrowed).

To date, eight individuals (two males, four females and two juveniles) have been collected from a single 1 m² patch of soil. The specimens were all recovered following shallow digging (to approx. 10 cm depth), removing and breaking apart large clayey soil clods, and inspecting exposed macropores, in which the woodlice reside (Fig. 3B).



Figure 3: Habitat of *Metatrichoniscoides celticus* at Horfield Allotments.
A) Bare allotment soil from which specimens were collected; B) Closeup on soil macropores.
(Images © Frank Ashwood).

Specimen details

The specimens collected on 10.x.2020 by FA and examined by SJG consisted of an adult male approx. 1.5 mm body length, two adult females of 1.75 mm body length, and one juvenile of only 1 mm (shown in Fig. 1). The specimens have been retained in the personal collection of FA. Record details have been submitted to the BMIG Non-marine Isopod Recording Scheme via iRecord (www.brc.ac.uk/irecord). Species found on the same allotment plot are *Trichoniscoides sarsi* (Patience) (another important discovery; Ashwood & Gregory, 2021), *Platyarthrus hoffmannseggii* Brandt, *Armadillidium nasatum* Budde-Lund, *Oniscus asellus* L., *Porcellio scaber* Latreille and *Philoscia muscorum* (Scopoli).

Discussion

Current evidence supports the idea that *M. celticus* is an elusive soil-dwelling species and is undoubtedly under-recorded. In common with other elusive soil-dwelling trichoniscids, *M. celticus* is usually found by searching the underside of large stones firmly embedded into damp soil (Gregory, 2009). Although elusive, this species may be locally numerous once a favoured niche is discovered (Chater, 1986): within the allotment patch in which this discovery was made, FA has readily found more specimens during subsequent attempts to do so.

As predicted by Gregory (2009), it is now apparent that *M. celticus* is much more widely distributed than previously thought. Previously known from a small area of south Wales, Hughes (2019) extended its range 170 km further north into Anglesey, north Wales. Now, *M. celticus* has been located in Bristol, south-west England. On current evidence, *M. celticus* shows a preference for humus-rich soil overlying calcareous geology on or near the coast. This seems to fit somewhat with this latest discovery, which was on organic-rich heavy clay soil with underlying limestone (British Geological Survey, 1999). *Metatriconiscoides celticus* could therefore be expected to occur in other areas underlain by limestone in south-west England both on or near the coast. It is quite possibly more widely present in western Britain, perhaps even north-west France or Ireland too – with the latter two relatively under recorded compared to UK. Despite recent surveys, it has not been recorded from The Netherlands nor Belgium (Berg *et al.*, 2008; De Smedt *et al.*, 2020).

This finding also marks the first recorded occurrence of *M. celticus* from a heavily synanthropic habitat, suggesting it can occupy a broader range of habitat types than previously thought. Occurrence may be more dependent on soil type and structure rather than associated vegetation. Potential future sites in which this species may be found might include other synanthropic sites, such as gardens and disused limestone quarries, in addition to allotments. Interestingly Harding & Sutton (1985) state that surveys of apparently suitable sites were undertaken in south-west England, but *M. celticus* was not found.

The distribution of *M. celticus* in the UK is complicated by the occurrence of *M. leydigii* which is now also known from the west coast of Britain (Hughes, 2020). *Metatriconiscoides celticus* and *M. leydigii* are morphologically very similar, and reliable separation between the two species can only be achieved through dissection of male specimens, assessing the shape and form of pleopods 1 and 2 (Hopkin, 1991; Oliver & Meechan, 1993). Within the British Isles *M. leydigii* is known from four localities (Fig. 4). Two sites are clearly synanthropic; a garden centre in Oxford and a walled garden at Wentworth Castle Gardens (Hopkin, 1990; Richards, 2016). However, the other two sites, the Medway estuary in Kent and the Ribble estuary in Lancashire, are coastal and appear to be semi-natural habitat; although industry and docks, respectively, lie close to both sites (Gregory, 2012; Hughes, 2020).

Single female specimens of a *Metatriconiscoides* (at the time thought to be *M. celticus*) have been collected from semi-natural coastal habitats at St Bees Head, Cumbria (Hopkin, 1987) and Giant's Causeway, Co. Antrim, Ireland (Irwin, 1992). The former was hand-sorted from among accumulations of damp Triassic red sandstone rubble at the base of the sea cliffs (Hopkin, 1987), and the latter under a

stone embedded in grass turf growing on sand derived from basalt (Irwin, 1992), and neither sites have underlying calcareous geology. In light of the discovery of coastal populations of *M. leydigii*, from Kent, south-east England and recently from Lancashire, north-west England (Gregory, 2012; Hughes, 2020) (Fig. 4) the possibility should be considered that the St Bees Head and Giant's Causeway records could in fact prove to be *M. leydigii*. Likewise, it should be borne in mind that inland observations of female *Metatrichoniscoides* sp., especially those in synanthropic habitats, could prove to be *M. celticus*.

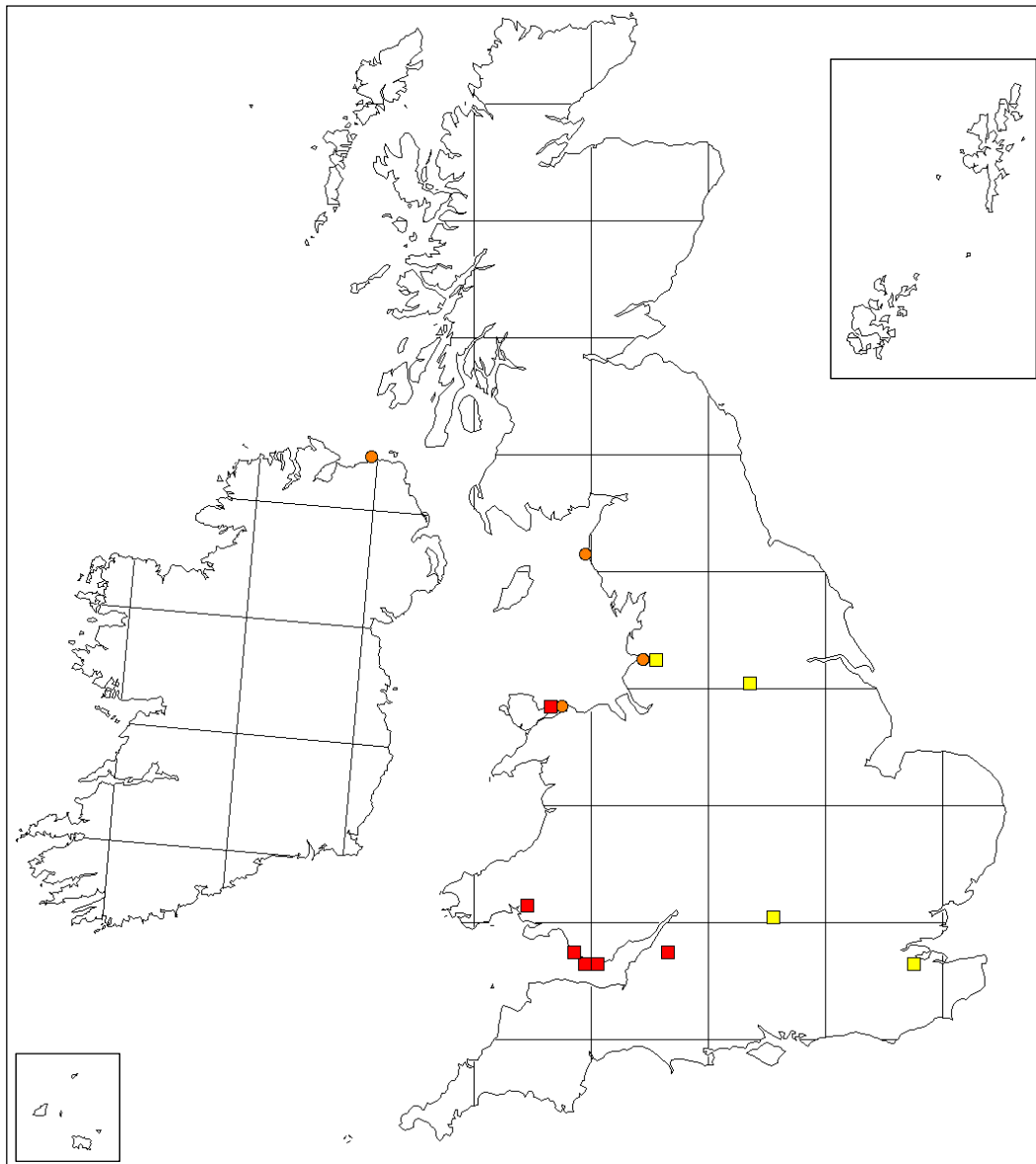


Figure 4: Distribution of *Metatrichoniscoides* species in Britain and Ireland.

■ *Metatrichoniscoides celticus* male; ■ *Metatrichoniscoides leydigii* male;
 ● female *Metatrichoniscoides* species.

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