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## **OBSERVATIONS ON TWO WOODLOUSE SPECIES (ISOPODA; ONISCIDEA) NEW TO NORTH WALES: *METATRICHONISCOIDES CELTICUS* OLIVER & TREW, 1981 AND *PHILOSCIA AFFINIS* VERHOEFF, 1908**

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### **ABSTRACT**

The terrestrial woodlice *Metatrichoniscoides celticus* Oliver & Trew, 1981 and *Philoscia affinis* Verhoeff, 1908 are reported as new to North Wales. *M. celticus* is recorded at its 5<sup>th</sup> confirmed location in Britain from heathland surrounding Mariandyrys NNR, Anglesey. All previously known records of this elusive endemic are restricted to the south coast of Wales. *P. affinis* is also recorded at its 7<sup>th</sup> British site in woodland on Roman Camp, Bangor, Gwynedd, after being discovered new to Britain in 2017. A description with illustrations is provided for both, as well as an updated discussion of habitat preferences based on these new observations.

### **INTRODUCTION**

Woodlice are considered to be the most successful group of terrestrial crustaceans, occupying most of the world's land masses and ecoregions (Schmalfuss, 2004). Although species richness appears to decrease at higher latitudes within Europe (Sfenthourakis & Hornung, 2018), the United Kingdom still boasts c.40 native and naturalised woodlouse species (Gregory, 2009). Despite this relatively high diversity, there is still a considerable lack of records for many parts of the UK, especially from more remote regions.

One such area is North Wales, which is comprised of six counties: Anglesey, Conwy, Denbighshire, Flintshire, Gwynedd and Wrexham. Since the beginning of woodlouse recording in the UK, only one comprehensive survey of the area has ever been conducted. This study took place in Bangor, Gwynedd in 1985 by the British Isopoda Study Group (BISG) and recorded a total of 17 native species (Hopkin, 1985). Further sources confirmed the presence of *Armadillidium depressum* (Clements & Alexander, 1987), *A. nasatum* (Larwood, 1920), *A. pulchellum* (Fussey, 1980), *Porcellio dilatatus* (Fussey, 1981) and *Trichoniscoides saeroeensis* (Loxton, 2008), bringing the current North Wales species list to 22.

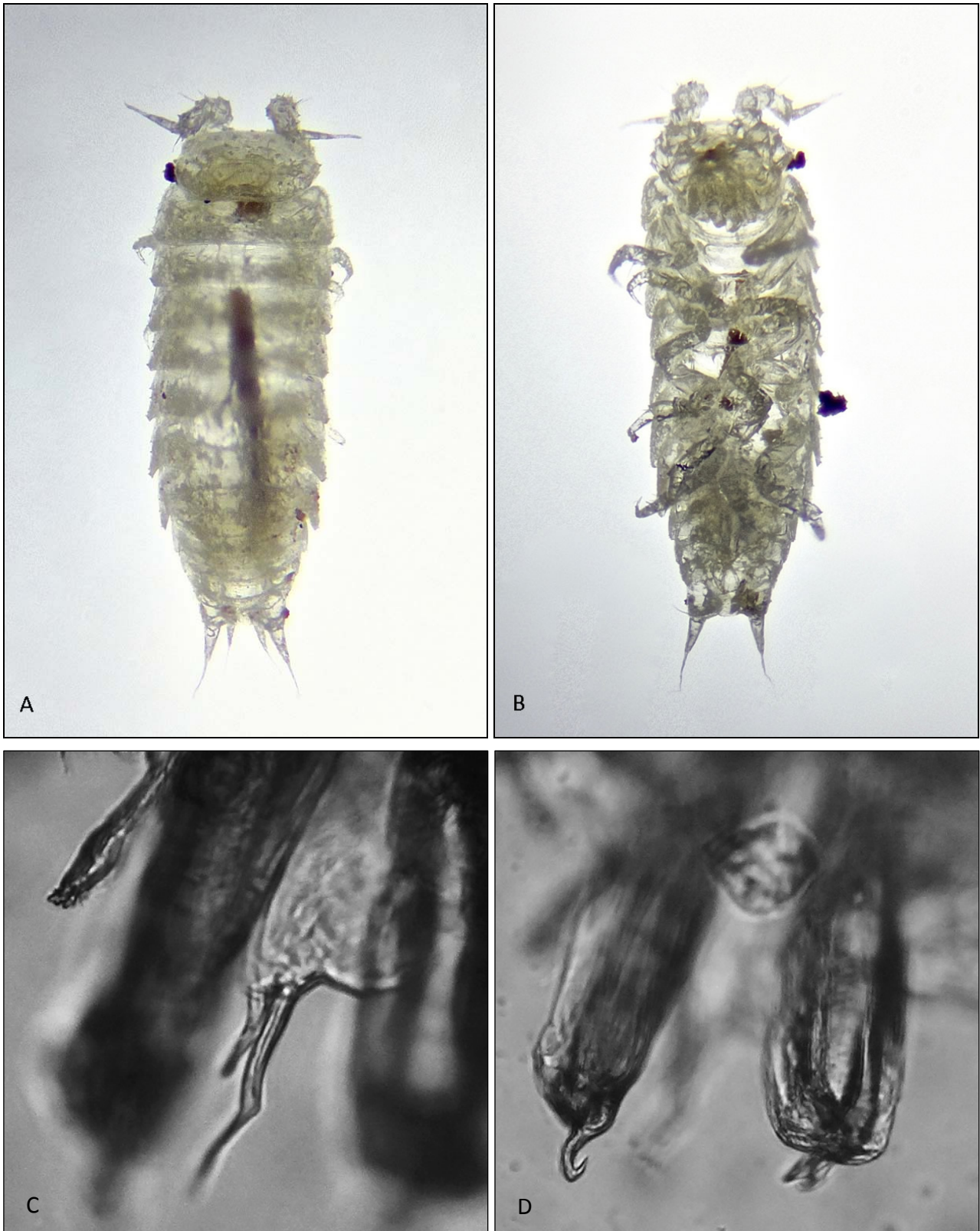
Surprised by the lack of modern records, random sampling was undertaken by the author at different locations around Bangor, Gwynedd starting in October 2018 to update and provide new records for the area. As a result, two notably significant and under-recorded species; *Metatrichoniscoides celticus* and *Philoscia affinis*, are described as new to North Wales.

### **DESCRIPTION**

#### **Family Trichoniscidae**

#### ***Metatrichoniscoides celticus* Oliver & Trew, 1981**

On 24.ii.2019, one male and one female blind Trichoniscoid woodlouse were found under embedded limestone blocks, alongside *Haplophthalmus mengii* (Zaddach) and *Trichoniscus pygmaeus* Sars in heathland around the Mariandyrys NNR (SSSI) (SH 6019 8102) in the south east of Anglesey, 0.8 km from the coast. Both individuals were collected and examined under dissection microscope and were provisionally identified as a *Metatrichoniscoides* spp. Vandel, due to the lack of ommatidia and the coarsely tuberculate body (Figs. 1A, 1B).



**Figure 1: Male *Metatrichoniscoides celticus* from Mariandyrys, Anglesey**  
A) Habitus, dorsal view; B) Habitus, ventral view; C) Pleopod 1, distal articles of endopodite and exopodite; D) Pleopod 2, with distal articles of both endopodites.

There are two confirmed members of the genus *Metatrichonisoides* in Britain; *M. celticus*, which is a British endemic and is found at four localities along the south coast of Wales (Oliver & Trew, 1981; Chater, 1986), and *M. leydigii* (Weber), known from three localities: a garden centre in Oxfordshire (Gregory & Campbell, 1995), an ornamental garden in Derbyshire (Richards, 2016) and a single male collected from the seminatural banks of the River Medway, Kent (Gregory, 2012). *M. leydigii* is also widespread in Northern Europe, occurring in France, Belgium, the Netherlands and Germany (Schmalfuss, 2004).

The male specimen from Mariandyrys was sent to Steve Gregory within days of discovery for dissection, and was identified as *M. celticus* due to the male genital characteristics.

#### *Appearance*

Adult size varies between 0.9-2.3 mm, with males typically being smaller (Oliver & Trew, 1981) - The male specimen from Mariandyrys (Figs. 1A, 1B) measured 1.75 mm. The entire body is off-white and translucent, with some longitudinal opaque white subcuticular patterning near the dorsoventral region. The dorsum is also noticeably covered with coarse tubercles, and the ommatidia is entirely lacking.

#### *Male Sexual Characteristics*

Pleopods 1 and 2 match those figured in Oliver & Trew (1981). The exopodites of pleopod 1 are terminated with distal processes ('tails') of uneven lengths. The shorter distal region of the endopodites are spearhead shaped with tightly packed outwardly facing bristles (Fig. 1C). The endopodites of pleopod 2 are tipped with hooks and the exopodites are greatly reduced (Fig. 1D).

#### *Distribution*

Confirmed males of *M. celticus* have only been known from four sites along the south coast of Wales; in the Vale of Glamorgan between Ogmores-by-the-sea and Nash Point, as well as in an abandoned limestone quarry in Crwbin, 50 km west from the type locality (Oliver & Trew, 1981; Chater, 1986). Due to this limited distribution range (only 63 km), as well as its elusiveness and small population size, *M. celticus* has been listed as Vulnerable by the IUCN (Griffiths, 1996).

Therefore the male specimen confirmed here drastically extends the known range by a further 170 km from its closest known location at Crwbin. A further female *Metatrichonisoides* was also found on 17.ii.2019 by the author at the Great Orme, Llandudno, Conwy (SH76628296) 16 km North East from Mariandyrys and is highly likely to represent another record for this species due to its close proximity.

#### *Habitat*

*M. celticus* was originally referred to as 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). Although this is true of the type localities, the specimens found inland at Crwbin were underneath large semi-embedded limestone boulders in stony soil, suggesting a much broader habitat preference (Chater, 1986).

Female representatives that are believed to be *M. celticus* have also been found at St Bees Head in Cumberland (Hopkin, 1987), and Giant's Causeway, Co. Antrim, Ireland (Irwin, 1992). But due to their unconfirmed identification, it may be unwise to factor them in to determine habitat choice. There is however, considerable similarity between the geology of all confirmed records of *M. celticus* in Wales. Those of the type locality between Ogmores-by-the-sea and Nash point are situated on an extensive area of Limestone of the Portkerry Member (Lias Group) (BGS, 2017). The Crwbin quarry record is nestled directly on a very narrow band of the Pembroke Limestone Group which runs from North East to South

West towards the coast at Kidwelly (BGS, 2017). The new records from Mariandyrys is situated on the Loggerheads Limestone Formation which outcrops on the South Eastern tip of Anglesey, and the unconfirmed female representative from the Great Orme is found on Cefn Mawr Limestone Formation which makes up the headland and closely surrounding peaks of Llandudno (BGS, 2017). It is therefore possible to speculate that *M. celticus* has a preference for calcareous geology with alkaline-humus rich soil, on or near the coast.

Further efforts to locate this species in the United Kingdom, or even the northern coastlines of France and Spain, could be focused on regions with shallow calcareous bedrock.

## Family Philosciidae

### *Philoscia affinis* Verhoeff, 1908

While sampling for woodlice at Roman Camp, Bangor (SH58087270) on 24.xi.2018, a large number of *Philoscia* spp. Latreille, were found in acidic, mixed, predominantly oak (*Quercus* spp.) and birch (*Betula* spp.) woodland amongst leaf litter and under logs, alongside *Oniscus asellus*, *Porcellio scaber* and *Trichoniscus pusillus* agg.. Several individuals were taken for examination (Fig. 2) to determine the possibility of these being the recently discovered British native *P. affinis*, as opposed to the widespread and ubiquitous *P. muscorum* (Scopoli).

Specimens were confirmed without difficulty to be *P. affinis* after examination of the male 7<sup>th</sup> pereopod under dissection microscope.

#### Appearance

Figs. 2 & 3. Five males from Roman Camp were measured with an average length of 6 mm. The females typically varied extensively in size but did not exceed a length greater than 11 mm. The body of *P. affinis* has a stepped outline and is entirely smooth, lacking tuberculation or hairs. Pleopodal lungs are entirely absent and the flagella segments of the antennae are divided into three. The head colouration is typically pigmented with two shades of brown, with the lighter being distributed as a mosaic pattern, the head is also non-distinct from the colouration of the rest of the body and typically lacks the yellow spot on the rear edge of the head usually seen in *P. muscorum*. *P. affinis* also appears to have a white stained dot on the lower frontal edge of each epimeron, however this isn't always present in some of the reddish brown or yellow colour variants.

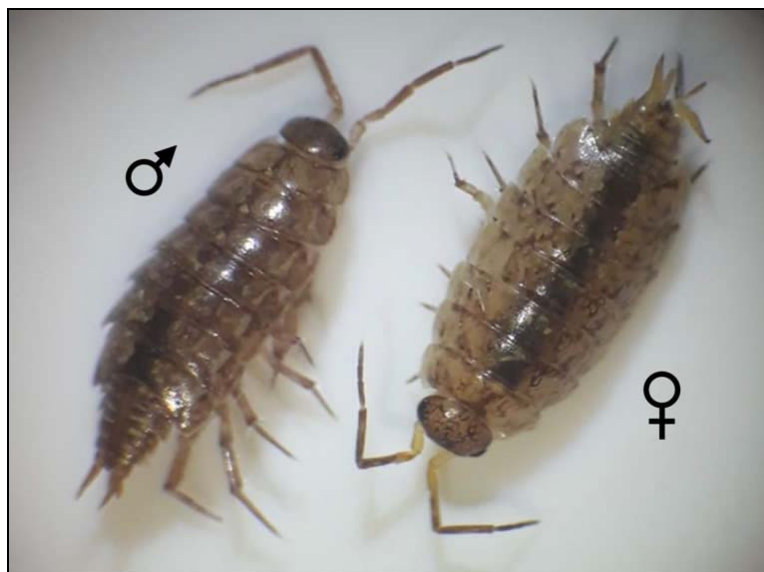
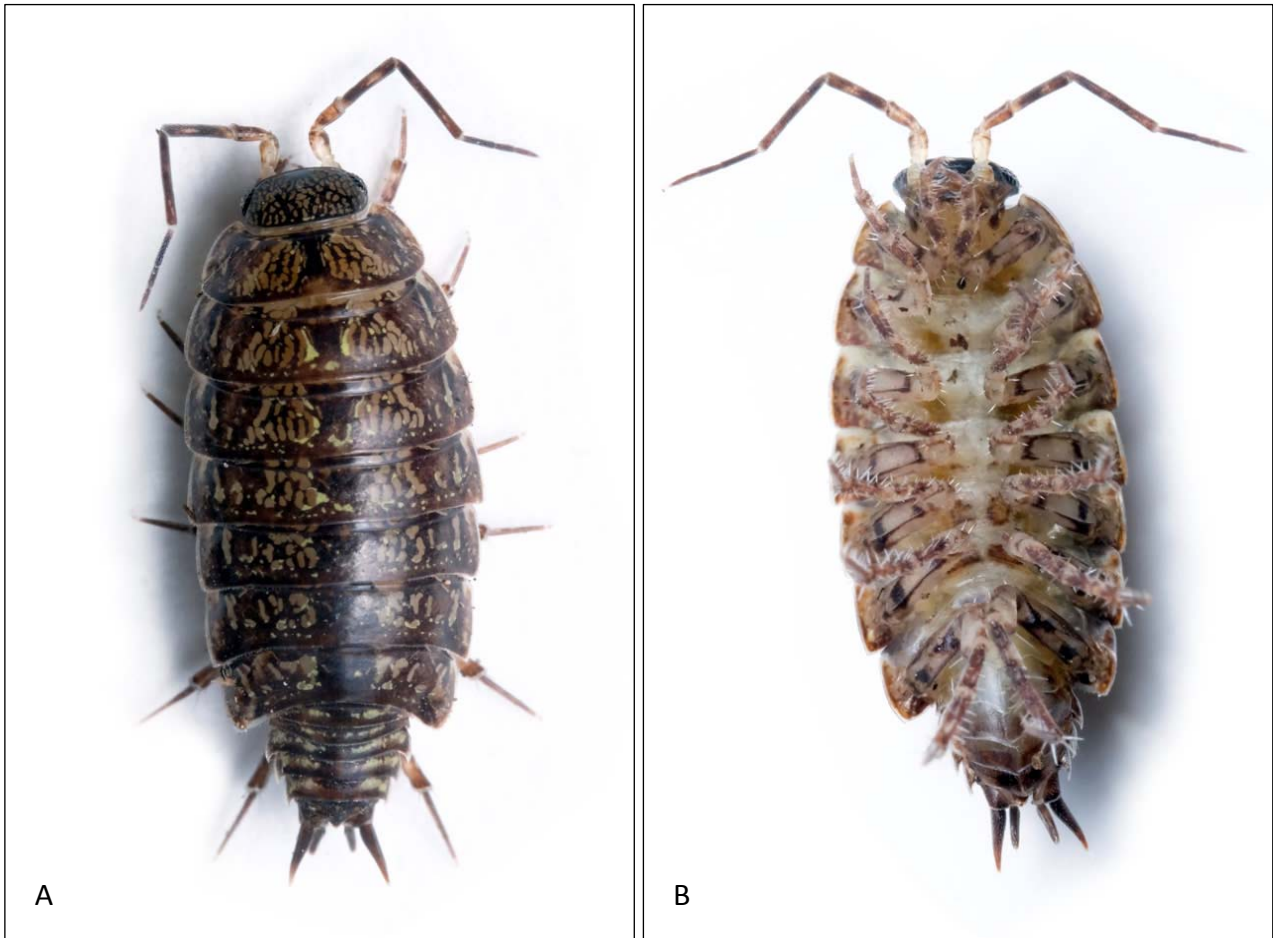


Figure 2: Male and female *P. affinis* from Roman Camp, Bangor, Gwynedd



**Figure 3: Female *P. affinis* from Bangor Mountain, Bangor, Gwynedd**  
A) Dorsal view; B) Ventral view



**Figure 4: 7<sup>th</sup> male pereiopod with the erect spur of the merus arrowed**

### *Male Sexual Characteristics*

*P. affinis* can be identified by the erect spur on the lower joint of the merus of the 7<sup>th</sup> male pereopod in lateral view (Fig. 4) (Vandel, 1962; Segers & Boeraeve *et al.*, 2018).

### *Distribution*

Since its initial discovery in 2017 from old museum specimens collected in south east England in 1985 (Segers *et al.*, 2018), 6 further confirmed sites have been made across the UK from Western Scotland down to South West England. Although there are currently few records it is likely this species is widespread, with what seems to be a south westerly distribution trend.

Therefore, the Roman Camp observation fills a gap in the current records. *P. affinis* has since been found by the author at several adjacent woodlands in the Bangor area, including Bangor Mountain (SH58301 71988) on the 7.ii.2019 (female Fig. 3) as well as being found among coastal shingle on the 9.ii.2019 at the Spinnies Aberogwen (SH6172272453).

### *Habitat*

Vandel (1962) found that *P. affinis* frequented damp forests in France, and recent records from Belgium suggested that it may favour moderately damp oak woodland (Boeraeve *et al.*, 2017). Specimens collected by Segers, *et al.* (2018) from Houghton, West Sussex were situated on lime-rich soil over chalk and limestone, amongst beech trees (*Fagus sylvatica*). *P. affinis* collected by Garnham (2019) from several sites across Cumbria show similar habitat trends. Records include: Warton Crag, Carnforth from mixed woodland including ash (*Fraxinus excelsior*), oak, hazel (*Corylus avanula*), yew (*Taxus baccata*), holly (*Ilex aquifolium*), hawthorn (*Crataegus monogyna*) and blackthorn (*Prunus spinosa*). Lords Lot, Carnforth from oak, beech and scot's pine (*Pinus sylvestris*) woodland and at Trowbarrow NR, Carnforth from mixed woodland containing sycamore (*Acer pseudoplatanus*), yew, oak and ash. The specimens from Roman Camp, Bangor, were collected from an east facing hillside in oak and birch dominated woodland, with occasional ash, yew and holly trees on moderately damp soil over the Llanberis Slates (BGS, 2017). In comparison, the individual encountered at Spinnies, Aberogwen, occurred in a seemingly uncharacteristic environment compared to the later records. However, the north-facing coastal shingle they were collected from backed immediately onto mixed woodland, containing oak, beech and hawthorn, where leaf litter material of the respective trees had congregated between the pebbles.

The records with accessible habitat data above suggest *P. affinis* prefers relatively damp mixed woodland, dominated by either oak, beech or a mix of the two, with rock type appearing to have little influence.

Although no significant inland records have been made so far within Britain, it is likely that coastal woodlands should (according to current records) be favoured to search for this species.

## OVERVIEW OF RECORDS

*Metatrichoniscoides celticus*: Mariandyrys, Anglesey, Wales: SH60198102, 24.ii.2019, 1♂, 1♀, Thomas Hughes leg., Steve Gregory, det.

*Metatrichoniscoides cf. celticus*: Great Orme, Llandudno, Conwy, Wales: SH76628296, 17.ii.2019, 1♀, Thomas Hughes leg./det.

*Philoscia affinis*: Roman Camp, Bangor, Gwynedd, Wales: SH58087270, 24.xi.2018, 5♂, 8♀, Thomas Hughes leg./det.

*Philoscia affinis*: Bangor Mountain, Penrhyn Arms Wood, Bangor, Gwynedd, Wales: SH58301 71988, 7.ii.2019, 2♂, 4♀, Thomas Hughes leg./det.

*Philoscia affinis*: Spinnies Aberogwen, Bangor, Gwynedd, Wales: SH6172272453, 9.ii.2019, 2♂, Thomas Hughes leg./det.

## ACKNOWLEDGMENTS

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