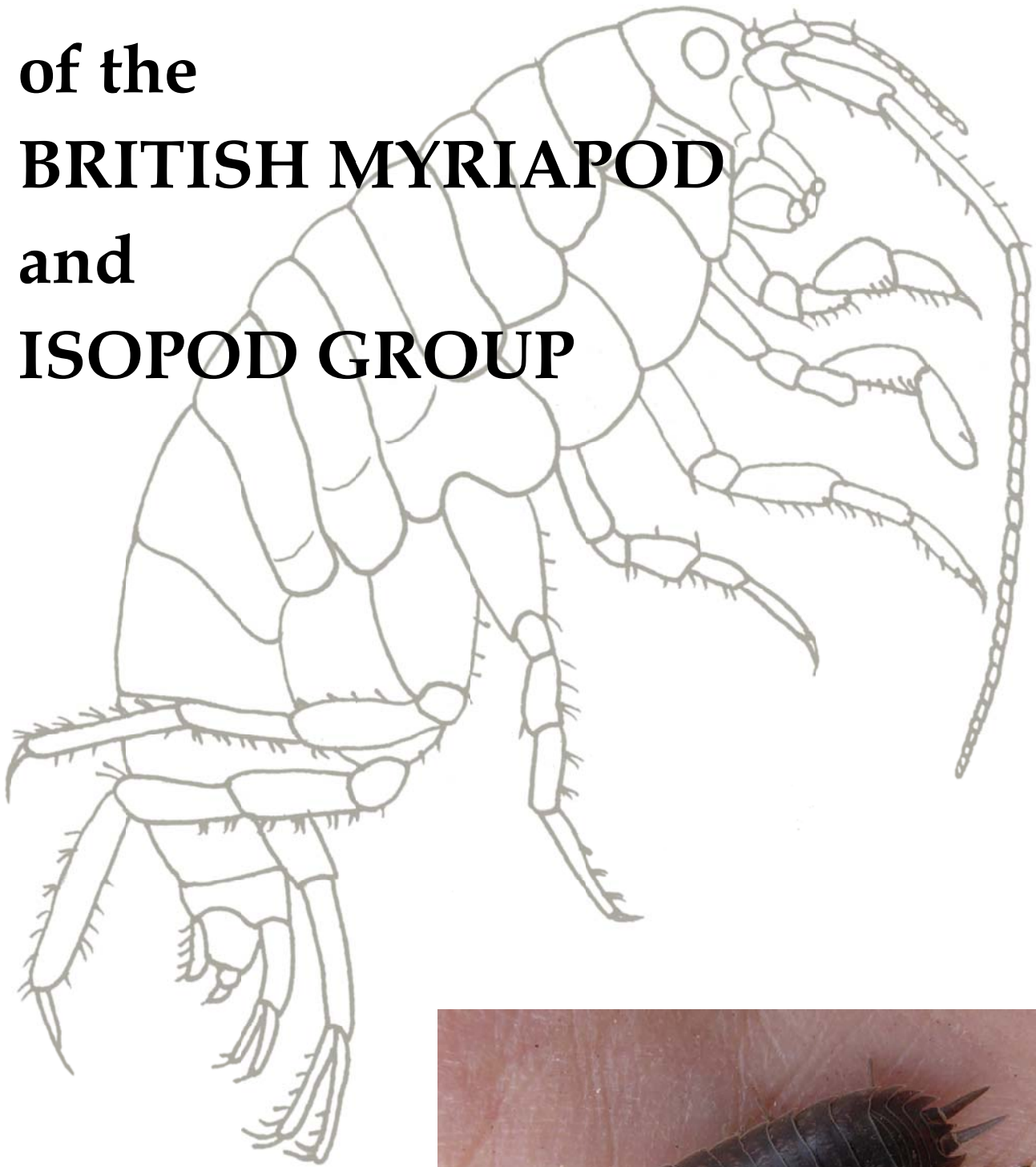


**Bulletin  
of the  
BRITISH MYRIAPOD  
and  
ISOPOD GROUP**



## CONTENTS

---

<b>Editorial</b>	1
<b>Articles</b>	
On the terrestrial landhopper <i>Arcitalitrus dorrieni</i> (Hunt, 1925) (Amphipoda: Talitridae): Identification and current distribution – Steve J. Gregory	2
Early county lists of non-marine Isopoda and Myriapoda from Cambridgeshire compiled by the Rev. Leonard Jenyns – Paul T. Harding and A.D. Barber	14
Is <i>Porcellio laevis</i> (Latreille) declining in Britain and Ireland? – Paul T. Harding	23
<i>Cylindroiulus apenninorum</i> (Brölemann, 1897) (Diplopoda, Julida: Julidae) new for the UK from the Isle of Wight and South Devon – A.D. Barber & Helen J. Read	28
A third British site for <i>Metatrichoniscoides leydigii</i> (Weber, 1880) – Paul Richards	34
New records and habitat observations for <i>Trichoniscoides</i> species (Isopoda, Oniscidea: Trichoniscidae) from Bedfordshire and Derbyshire – Paul Richards	37
Identification of North European <i>Melogona</i> females, and the first record of <i>M. gallica</i> (Latzel, 1884) from Denmark (Diplopoda, Chordeumatida: Chordeumatidae) – Henrik Enghoff	42
Confirmation of the presence of <i>Lamyctes africanus</i> (Porath, 1871) in France (Chilopoda, Lithobiomorpha: Henicopidae) – Etienne Iorio	44
<b>Miscellanea</b>	
Defence fluids of millipedes; a warning – Thomas Wesener	49
<b>Field meeting reports</b>	
Report of BMIG field meeting at Claonaig, Kintyre, September 2010: Woodlice and Millipedes, including additional Scottish records of <i>Chordeuma sylvestre</i> C.L.Koch and <i>Leptoiulus belgicus</i> Latzel – Steve J. Gregory	50
<b>Book reviews</b>	
Les chilopodes (Chilopoda) de la moitié nord de France (by Etienne Iorio & Aurélien Labroche) – A.D. Barber	59

Cover illustration: *Arcitalitrus dorrieni* (Hunt), habitus.

Cover photograph: *Porcellio laevis* (Latreille) male © Jim Flanagan.

Editors: H.J. Read, A.D. Barber & S.J. Gregory

c/o Helen J. Read; email [helen@helen-read.co.uk](mailto:helen@helen-read.co.uk)

© Published by the British Myriapod and Isopod Group, 2016

ISSN 1475 1739

## EDITORIAL

This edition of the Bulletin, the second to be published ‘on-line’ only, continues with the theme of presenting new species to the British Isles. This year new species include *Cylindroiulus apenninorum* from Italy which has turned up recently on the Isle of Wight and in Plymouth. Already known from the Netherlands the recent English records might suggest that it has gone unnoticed in the UK in the past and could be found more widely by diligent recorders. In fact, this was indicated in an article by Casimir Jeekel comparing the Dutch and British millipede fauna in the Bulletin in 2001 where he commented: "I have always wondered why this Italian species, which was reported from the Netherlands already in 19th century, has never been collected in other West European countries like the U.K" (see: *Bulletin of the British Myriapod and Isopod Group* 17: p51. Download pdf at: <http://bmig.org.uk/sites/www.bmig.org.uk/files/bulletin/BullBMIG17%20p43-59%20Jeekel%20Dutch-UK%20fauna.pdf>). *Lamyctes africanus* is another species to look out for and we include an update about this species from France.

Woodlice are well represented in this year’s Bulletin with a historical article about Isopods as well as Myriapods recorded by Rev. Jenyns in Cambridgeshire in the nineteenth century compiled by Paul Harding and several short papers including some new records of some of our smaller species and the paucity of recent records for *Porcellio laevis*. The BMIG recording scheme adopted the land hopper *Arcitalitrus dorrieni* as an ‘honorary’ terrestrial isopod some years ago and articles on this species have appeared in previous Bulletins. We have been aware that this species is steadily being found more widely across the UK and the article by Steve Gregory presents a timely review of the current situation.

The identification of female millipedes is frequently problematic so the item by Henrik Enghoff presenting a method for determining the northern European *Melogona* species is a welcome addition to the literature.

BMIG continues to actively encourage the recording of millipedes, centipedes and woodlice though the annual field meetings and supporting recorders throughout the year. In return recorders are urged to become more involved in the Group through attending the meetings that are organised and through submitting their records, even of common species, on a regular basis. Additionally, the group is encouraging the dissemination of information and news through the website and various forms of social media. We have the following accounts and it would be wonderful if we can encourage more people to contribute to them, building our community of myriapod and isopod enthusiasts and spreading the word more widely.

**Facebook:** <https://www.facebook.com/BritishMyriapodandIsopodGroup>

**Twitter:** @britishmigroup <https://twitter.com/britishmigroup>

**Instagram:** britishmigroup <https://www.instagram.com/britishmigroup> (mobile phones and tablets)

## ON THE TERRESTRIAL LANDHOPPER *ARCITALITRUS DORRIENI* (HUNT, 1925) (AMPHIPODA: TALITRIDAE): IDENTIFICATION AND CURRENT DISTRIBUTION

Steve J. Gregory

200 Ock Street, Abingdon, Oxfordshire, OX14 5DR, UK.

E-mail: [stevegregory@btopenworld.com](mailto:stevegregory@btopenworld.com)

### ABSTRACT

Truly terrestrial Landhoppers (Talitridae) are characteristic inhabitants of subtropical forests, but one introduced species, *Arcitalitrus dorrieni*, is capable of surviving outdoors in the mild Atlantic regions of Ireland and southern and western Britain. The discovery of a few outlying populations of landhoppers in north-east Britain highlighted the need for an update-to-date identification work to check if these were indeed the same species, or another naturalised species of terrestrial Talitrid. Specimens of *A. dorrieni* are examined from across its known British and Irish range. A brief description and figures of key features are presented and comparison is made to other semi-terrestrial Talitrids, particularly *Cryptorchestia cavimana*. A brief review of the ongoing spread and current distribution of *A. dorrieni* in Britain and Ireland is presented. It is possible that successive generations of *A. dorrieni* have become better adapted to the temperate British climate. An identification key to separate *A. dorrieni* from other known British and Irish Talitrids is given.

### INTRODUCTION

The Talitridae is an amphipod family that is widely distributed across warm temperate and subtropical regions where they inhabit a wide variety of habitats from coastal to inland terrestrial habitats. However, the truly terrestrial Landhoppers are characteristic inhabitants of subtropical forests where they form an important component of the leaf-litter decomposition fauna. Several species have been accidentally transported by man and have established themselves in glasshouses throughout the world.

Four species of Landhopper (also known as Woodhopper or Lawn Shrimp) have been reported as introductions into Britain and Ireland. Three species, *Brevitalitrus hortulanus* Calman, 1912, *Talitroides alluaudi* (Chevreux, 1896) and *T. topitotum* (Burt, 1934) have only been recorded from inside heated tropical glasshouses, such as Kew Gardens and Glasgow Botanic Gardens (Cochard, Vilisics & Séchet, 2010). The fourth species, *Arcitalitrus dorrieni* (Hunt, 1925), is Britain's and Ireland's only truly terrestrial amphipod that is capable of surviving outdoors. Consequently, it has been adopted as an honorary 'woodlouse' by the BMIG woodlouse recording scheme (Gregory, 2000; Barber & Gregory, 2012).

*Arcitalitrus dorrieni* was originally described from Trescoe Abbey Gardens, Isles of Scilly, in 1924 (Hunt, 1925). A decade later it was also discovered in Co. Galway, western Ireland (Rawlinson, 1937). From the Isles of Scilly it rapidly colonised south-western England. Subsequently, it has spread further afield, especially into the mild and moist Atlantic regions of western Britain, but remained most frequent in south-west England and south Wales (Harding & Sutton, 1988; Cowling, *et al*, 2004). In Ireland it has been widely, but patchily, recorded in coastal regions where it may be under-recorded. Although *A. dorrieni* has been known from Royal Botanic Gardens Kew, London, since 1980 (Welch, 1981), there had been no subsequent records further north than this in eastern Britain. It is now known that *A. dorrieni* is native to the forests of New South Wales, eastern Australia (Peart & Lowry, 2006), where several other species of *Arcitalitrus* have been described.

This article was prompted by the reported occurrence of *A. dorrieni* in Sunderland, north-east England (Gregory, 2012), an area which experiences relatively cold and dry winters. Was this the same warmth and moisture loving species known from southern and western Britain, or was it different species of talitrid ‘landhopper’? It also appears that on occasions *A. dorrieni* has been confused with the semi-terrestrial species *Cryptorchestia cavimana* (Heller, 1865) (e.g. as reported by Gregory, 2013). There appears to be no readily available British work for the identification of *A. dorrieni*, or for the three ‘alien’ tropical glasshouse species, *Brevitalitrus hortulanus*, *Talitroides topitotum* and *T. alluaudi*. Lincoln (1979) primarily deals with British marine amphipods. It does describe and figure *A. dorrieni*, but excludes the three ‘alien’ species. Peart & Lowry (2006) provide an identification key to the nine known species of *Arcitalitrus* (all native to Australia), but, although briefly described, *A. dorrieni* is not figured.

Thus, British specimens of *A. dorrieni* are described and figured herein and a simple key to British terrestrial amphipods presented with the intention of encouraging interest in this neglected group of species.

## IDENTIFICATION OF *ARCITALITRUS DORRIENI*

### Material examined

Specimens thought to be *A. dorrieni* were examined from various sites, both within the known range (southern and western Britain and Northern Ireland) and also from recently discovered outlying sites along the eastern coast of Britain (East Anglia, north-east England and south-east Scotland). Material examined is listed in Table 1.

### Taxonomy

ORDER Amphipoda

  SUBORDER Senticaudata

    INFRAORDER Talitrida

      PARVORDER Talitridira

        SUPERFAMILY Talitroidea

          FAMILY Talitridae

*Arcitalitrus dorrieni* (Hunt, 1925)

              Synonyms: *Talitrus dorrieni* Hunt, 1925

*Talitroides dorrieni* (Hunt, 1925)

*Talitrus sylvaticus* Haswell, 1879 (in part)

Hurley (1975) established subgenus *Talitrus* (*Arcitalitrus*) to accommodate *Talitrus sylvaticus* Haswell, 1879 and treated *T. dorrieni* as a junior synonymy of that species. Consequently, some older British works (e.g. Ingle, 1958) have used the name *sylvaticus* (for *dorrieni*). Subsequently, Bousfield (1984) resurrected *T. dorrieni* as a valid species and Friend (1987) elevated sub-genus *Arcitalitrus* to generic status to accommodate *dorrieni* and *bassianus* Friend. Although this synonymy was acknowledged by Moore & Spicer (1986), there appears to have been some confusion that two species, *A. dorrieni* and *A. sylvaticus*, have been recorded from Britain and Ireland, rather than just the former.

### Description

Descriptions of *Arcitalitrus dorrieni* are given by Hunt (1925) and Lincoln (1979). The description below is based on material identified as *A. dorrieni* in Table 1. Key characters are shown in **bold**.

TABLE 1: Localities of amphipod material examined in the course of this study

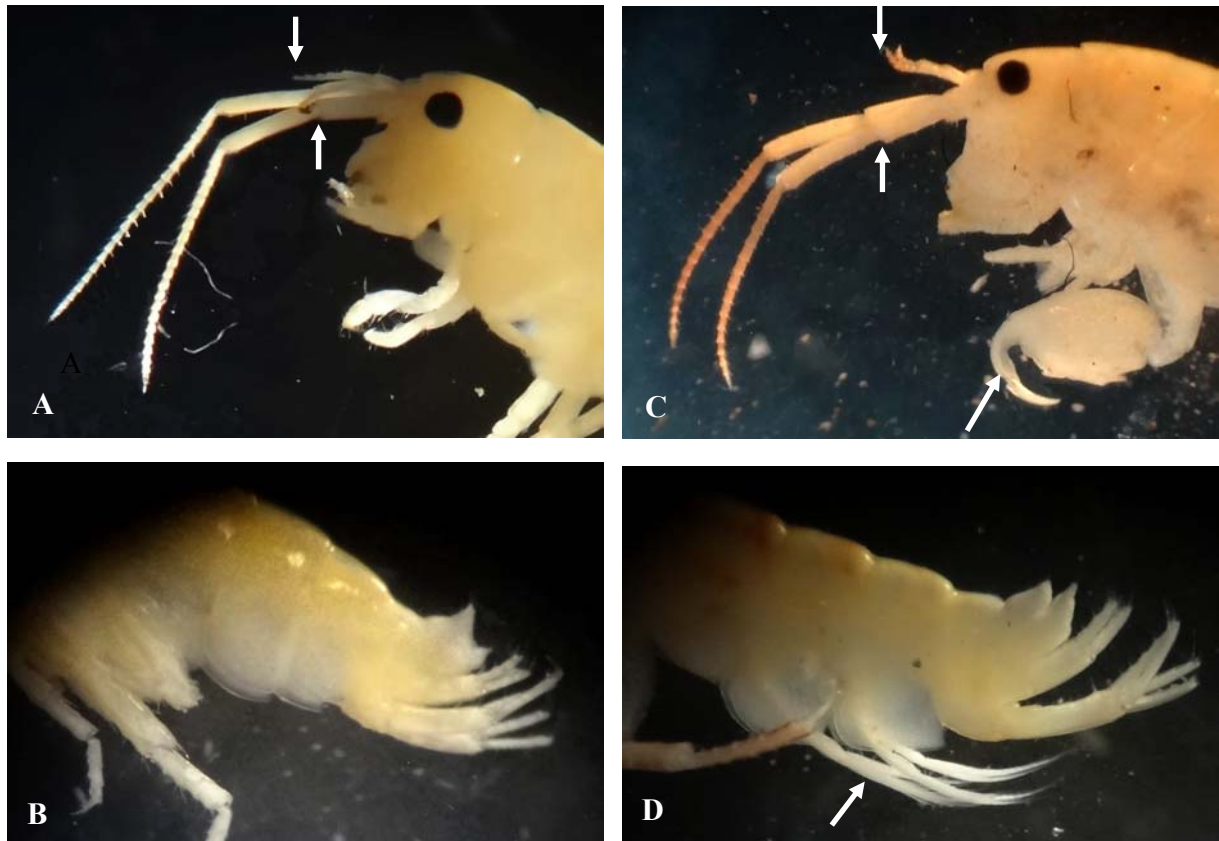
\*determined by Roy Anderson using the information presented in this paper

Locality	Vice County	VC no.	Grid Ref	Date of collection	Species determination
Eden Project	East Cornwall	2	SX 04-54-	18.ix.2010	<i>Arcitalitrus dorrieni</i>
Ivybridge	South Devon	3	SX 63-53-	12.xii.2012	<i>Arcitalitrus dorrieni</i>
Okehampton	North Devon	4	SX 59-95-	19.x.2015	<i>Arcitalitrus dorrieni</i>
Cardiff	Glamorgan	41	ST 17-83-	03.ii.2015	<i>Arcitalitrus dorrieni</i>
Ventnor, Bot. Gdn.	Isle of Wight	10	SZ 55-77-	07.xii.2015	<i>Arcitalitrus dorrieni</i>
Waterlooville	South Hampshire	11	SU 68-08-	31.x.2013	<i>Arcitalitrus dorrieni</i>
RHS Wisley Gdn.	Surrey	17	TQ 06-58-	1.iv.2016	<i>Arcitalitrus dorrieni</i>
Sheffield Park	East Sussex	14	TQ 41-23-	2.iv.2016	<i>Arcitalitrus dorrieni</i>
St. Leonards	East Sussex	14	TQ 80-10-	22.xi.2012	<i>Arcitalitrus dorrieni</i>
Preston	South Lancashire	59	SD 55-27-	02.vi.2010	<i>Arcitalitrus dorrieni</i>
Brodict Castle	Isle of Arran	100	NS 01-37-	13.ix.2010	<i>Arcitalitrus dorrieni</i>
Norwich	East Norfolk	27	TG 2--0--	09.xi.2012	<i>Cryptorchestia cavimana</i>
Newark-on-Trent	Nottinghamshire	56	SK 76-53-	12.i.2016	<i>Cryptorchestia cavimana</i>
Aberlady Bay	East Lothian	82	NT 46-80-	11.iv.2015	<i>Orchestia gammarellus</i>
Sunderland	County Durham	66	NZ 39-55-	01.ix.2012	<i>Arcitalitrus dorrieni</i>
Sunderland	County Durham	66	NZ 39-54-	16.i.2015	<i>Arcitalitrus dorrieni</i>
Edinburgh	Midlothian	83	NT 26-75-	10.iv.2015	<i>Arcitalitrus dorrieni</i>
Ballywalter Beach	Co. Down	H38	J 63-69-	20.ii.2016	<i>Arcitalitrus dorrieni</i> *
Belfast	Co. Antrim	H39	J 35-69-	18.ii.2016	<i>Arcitalitrus dorrieni</i> *
Belfast	Co. Antrim	H39	J 30-74-	18.ii.2016	<i>Arcitalitrus dorrieni</i> *

Body laterally compressed, up to 15 mm in length, cuticle lacking calcification. Eye circular about  $\frac{1}{3}$  head length (Figs. 1A & 2A). **Antenna 1 terminates beside the basal third of peduncle segment 3 of antenna 2** (Figs. 1A & 2B). Antenna 2 about 50% of body length (Fig. 2A), with flagellum about twice the length of the peduncle, **comprising about 25 articles in mature specimens** (Figs. 1A & 2B), but considerably fewer in immature specimens.

Gnathopod 1 and gnathopod 2 are not sexually dimorphic (as Figs. 2E & 2F). Gnathopod 2 with merus and carpus expanded posteriorly as a rounded flange, propodus of “mitten-like” type (Fig. 2F). Coxal gill 2 lobate, ‘W’ shaped, not incised (Fig. 2H). Coxal gill 6 lobate, anterior and posterior margins smooth, **apically deeply incised** (Fig. 2I). Gills 3-5 less well developed.

Epimeron 2 longer than epimeron 3 (Fig. 2C). Epimeron 3 with posterior margin weakly crenulate and posteroventral corner subquadrate (Fig. 2D). Uropod 1 and uropod 2 are not sexually dimorphic. Telson entire, longer than broad, with slight notch at tip, **with more than ten robust marginal and apical setae** (Fig. 2G).



**FIGURES 1A-B: *Arcitalitrus dorrieni* male, from Ivybridge, Devon.**

A) Antennae 1 & 2 (Note relative position of arrows in Figs. 1A and 1C), lateral view; B) Epimera 1-3 (note pleopods concealed) and urosome, lateral view.

**FIGURES 1C-D: *Cryptorchestia cavimana* male, from Norwich, Suffolk.**

C) Antennae 1 & 2 and gnathopod 2 (arrowed), lateral view; D) Epimera 1-3, showing conspicuous pleopods (arrowed) and urosome, lateral view.

Pleopod 1 well developed, biramous (Fig. 2J). Both rami well developed, distinctly segmented and longer than peduncle. Both typically with about 7 to 9 articles, the inner ramus slightly longer than the outer. The rami and outer edge of peduncle are fringed with stout plumose setae. Pleopod 2 also well developed, biramous, slightly longer and stouter than pleopod 1 (Fig. 2K). Both rami well developed, distinctly segmented and subequal in length to peduncle. Both typically with about 7 to 9 articles, the inner slightly longer than the outer. The rami and outer edge of peduncle are fringed with stout plumose setae. **Pleopod 3 is considerably reduced to little more than a tubercle (< 0.1 mm in length), entirely lacking rami** (Fig. 2L).

### Identification of British and Irish terrestrial and semi-terrestrial Amphipods

The terrestrial landhoppers and coastal sandhoppers (family Talitridae) are readily distinguished from the aquatic shrimps (families Crangonyctidae and Gammaridae) by antenna 1 (the dorsal pair) being considerably reduced in size; less than  $\frac{1}{4}$  the length of, and much narrower than, antenna pair 2 (the ventral pair) (Figs. 1A, 1C, 2B & 3A). They have round eyes (Figs. 1A & 1C) and an entire telson, bearing at most an apical notch (Fig. 2G). In contrast, the aquatic shrimps typically have antenna 1 and 2 subequal in size, or the shorter antenna (often pair 2) at least  $\frac{1}{2}$  the length of the longer. Eyes are oval or kidney shaped and telson is divided longitudinally into two parts, at least by a deep central cleft.

Although similar in appearance to other Talitrids, such as *Cryptorchestia cavimana*, *Orchestia* spp. and *Talitrus saltator*, *Arcitalitrus dorrieni* is darkly pigmented (almost black) in life. However, body pigments rapidly fade to pale orange upon preservation in alcohol. Confusion in the field is most likely to occur with the introduced *C. cavimana*, which may be darkly pigmented in life (dark brown) and is also capable of inhabiting semi-terrestrial sites far inland; albeit typically close to water (Lincoln, 1979). Both species have epimeron 3 and telson of similar shape (as in Figs. 2D & 2G), but differ in a number of other characters. The most useful characters for separating *A. dorrieni* from *C. cavimana* (and other related species) are detailed below.

A simple key to distinguish *Arcitalitrus dorrieni* from other British and Irish Talitrids is given in Appendix I.

#### *Relative lengths of antennal pairs 1 and 2*

In *A. dorrieni* antenna 1 is relatively long and terminates alongside the basal third of peduncle segment 3 of antenna 2 (Figs. 1A & 2B - arrowed). This character is shared with the introduced tropical glasshouse species, *B. hortulanus*, *Talitroides alluaudi* and *T. topitotum*.

In the case of *C. cavimana*, *Orchestia* spp. and *Talitrus saltator* antenna pair 1 is shorter and does not reach beyond the end of peduncle segment 2 of antenna pair 2 (Figs. 1C & 3A - arrowed).

#### *Number of flagella segments of antenna 2*

In mature specimens of *A. dorrieni* (up to 15mm in length) antenna 2 has the flagellum comprising about 25 articles (Figs. 1A & 2B). However, the number of flagella articles increases with each moult, so considerably fewer articles will be seen in immature specimens. Immatures examined of 7.5 mm in length have about 15 articles.

Mature *C. cavimana* (up to 20mm) have the flagellum of antenna 2 with about 15 articles (Figs. 1C & 3A). Other British and Irish species of *Orchestia* have between 10-17 articles, while *T. saltator* has about 35 articles that are wider than long (Lincoln, 1979; Chevreux & Fage, 1925).

#### *Shape of male gnathopod 2*

In *A. dorrieni* gnathopod 2 (Fig. 2F) is not sexually dimorphic, being identical in male and female specimens. This character is shared with the introduced tropical glasshouse species and the native sandhopper *T. saltator*.

In *Cryptorchestia*, *Orchestia* and related genera, males have gnathopod 2 with the propodus greatly enlarged, giving a 'boxing-glove' appearance, contrasting that of the female (Figs. 3C vs 3B).

#### *Shape of coxal gill 6*

In *A. dorrieni* coxal gill 6 (located at the base of pereopod 6) is lobate, with anterior and posterior margins smooth and apically with a deep cleft (Fig. 2I).

In *C. cavimana* coxal gill 6 is a rounded triangle (Fig. 3D), and in other species it is of a different, but equally characteristic, shape (but never with a deep apical cleft).

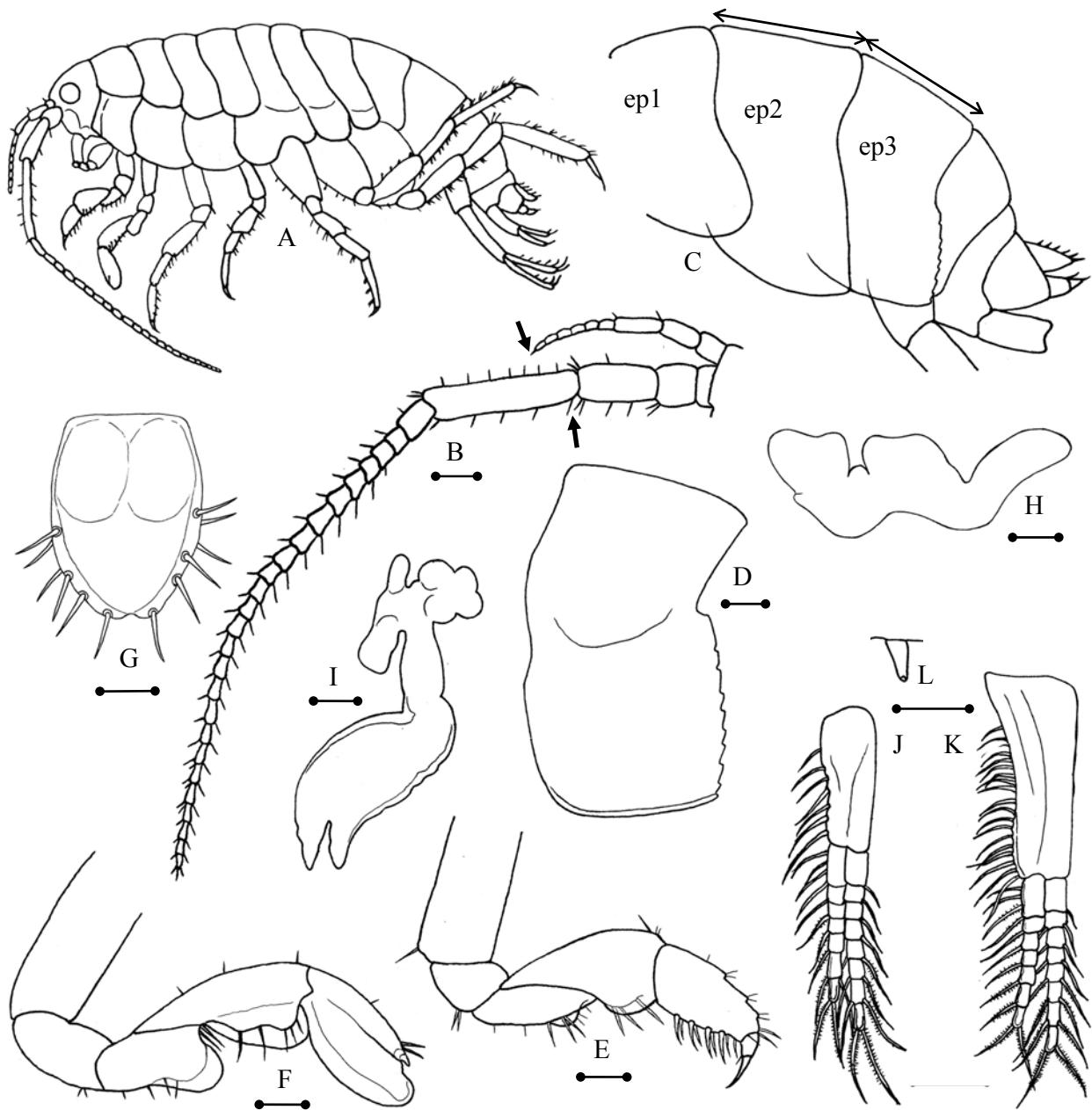
#### *Development of pleopods 1-3*

Although pleopods 1 & 2 are well developed in *A. dorrieni*, each bearing two distinctly segmented rami (Figs. 2J & 2K), they are relatively short (c. 1mm in length), directed anteriorly and consequently more or less obscured in lateral view by their corresponding epimera 1 and 2 (Fig. 1B). Pleopod 3 is



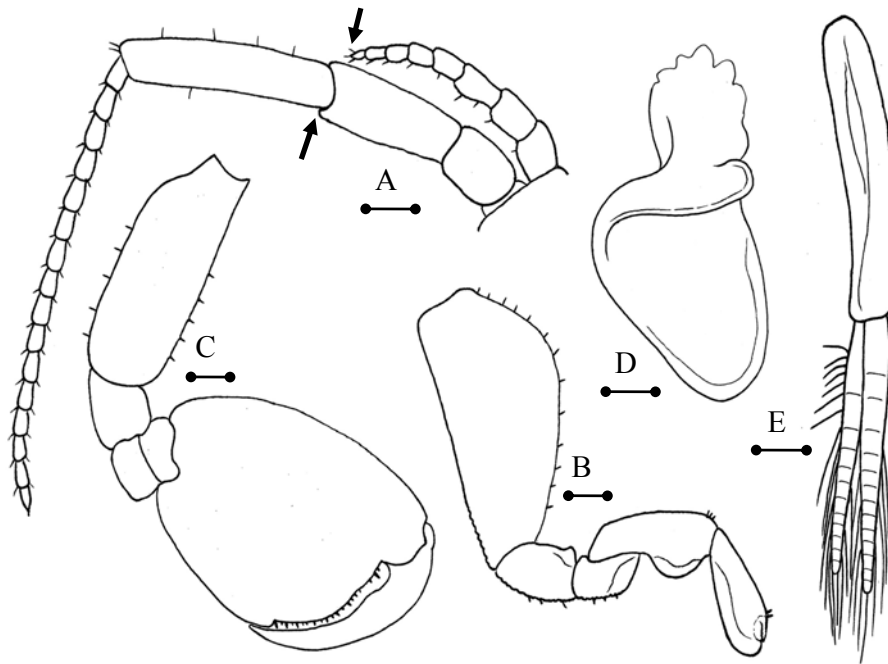
considerably reduced to little more than a tubercle (< 0.1 mm in length), entirely lacking rami (Fig. 2J) and very difficult to see.

In contrast, *C. cavimana* has all three pleopods (1-3) well developed (up to 3mm in length), with pleopod 3 bearing two distinct rami that are subequal in length to the peduncle (Fig. 3E). The pleopods are directed posteriorly, extending ventrally well beyond the epimera 1-3, and consequently conspicuous in lateral view (Fig. 1D). The pleopods are also similarly well developed, and visible in lateral view, in closely related genera of *Orchestia* and in *T. saltator*.



**FIGURE 2: *Arcitalitrus dorrieni* (Hunt) female. Specimen from Ivybridge, Devon**

A) Entire animal, lateral view; B) Antennae 1 and 2, lateral view (compare position of arrows with Fig. 3A); C) Epimeron 1-3 and urosome, lateral view; D) Epimeron 3, lateral view; E) Gnathopod 1, anterior view; F) Gnathopod 2, anterior view; G) Telson, dorsal view; H) Coxal gill 2, lateral view; I) Coxal gill 6, lateral view; J) Pleopod 1, anterior view; K) Pleopod 2, anterior view; L) Pleopod 3, anterior view. Scale bars = 0.2 mm



**FIGURE 3: *Cryptorchestia cavimana* (Heller), from Norwich, Norfolk**

A) Female, antennae 1 and 2, lateral view (compare position of arrows with Fig. 2B);  
 B) Female, gnathopod 2, anterior view; C) Male, gnathopod 2, anterior view; D) Female coxal gill 6,  
 lateral view; E) Female pleopod 3. Scale bars = 0.2 mm

### Other *Arcitalitrus* species

Peart & Lowry (2006) provide descriptions and identification keys to the nine known species of *Arcitalitrus* (all native to Australia). It is possible that other species may turn up in Britain or Ireland. They diagnose *Arcitalitrus dorrieni* by gill 6 being apically incised (Fig. 2I); pleopod 3 rami absent (Fig. 2L); uropod 3 peduncle with 2 robust setae; telson entire, with more than 10 robust setae (Fig. 2G). Two other species of *Arcitalitrus* also have gill 6 with a deep apical cleft as seen in *A. dorrieni* (and which also share the homoplastic character of epimeron 2 being longer than epimeron 3). *A. moonpar* Peart & Lowry has epimeron 3 with posteroventral corner evenly rounded, while *A. bundeena* Peart & Lowry has epimeron 3 with posteroventral corner bearing a prominent tooth formed by a notch on the posterior edge. In *A. dorrieni* epimeron 3 has the posteroventral corner subquadrate (Fig. 2D).

### THE CONTINUING SPREAD OF *ARCITALITRUS DORRIENI* IN BRITAIN AND IRELAND

A map of the current known distribution of *Arcitalitrus dorrieni* is given in Fig. 4. To give an indication of its spread across Britain and Ireland of over past decades, the earliest recorded occurrence of *A. dorrieni* within a given 10km square is plotted using four date classes (up to 1988, 1989 to 2004, 2005 to 2010 and 2011 to present). This is the opposite of conventional distribution maps where the most recent record in a 10km square takes precedence.

### Distribution up to 1988

Harding & Sutton (1988) summarised the British and Irish distribution (90 localities) of *A. dorrieni* known to that date (based on Richardson, 1980; Welch, 1981; Moore & Spicer, 1986). The species was shown to be widespread in the south and west of Cornwall (including the Isles of Scilly), with a scattering of sites along the southern coasts of Devon and Dorset. They considered that further

populations remained to be discovered within this range. Isolated records were known from Kew Gardens, Surrey and the Scottish islands of Colonsay, on the west coast. The only known Irish sites remained in the environs of the original 1936 record in Co. Galway.

### **New sites recorded between 1989 and 2004**

Cowling, *et al* (2004) reported some 60 new 10-km square records for *A. dorrieni* since the publication of Harding and Sutton (1988). This was mainly a consolidation of range in south-west England, but also wide scatter of records from south Wales and additional sites in the Scottish western Isles. Although its distribution has remained predominantly coastal, it also appears to be established in the London area. In Ireland it was widely, but patchily recorded, where it is possibly under-recorded. Of particular note is that Cowling, *et al* (2004) also reported a vast number of negative records outside this range, where surveys were undertaken, but *A. dorrieni* was not found.

### **Sites discovered since 2005**

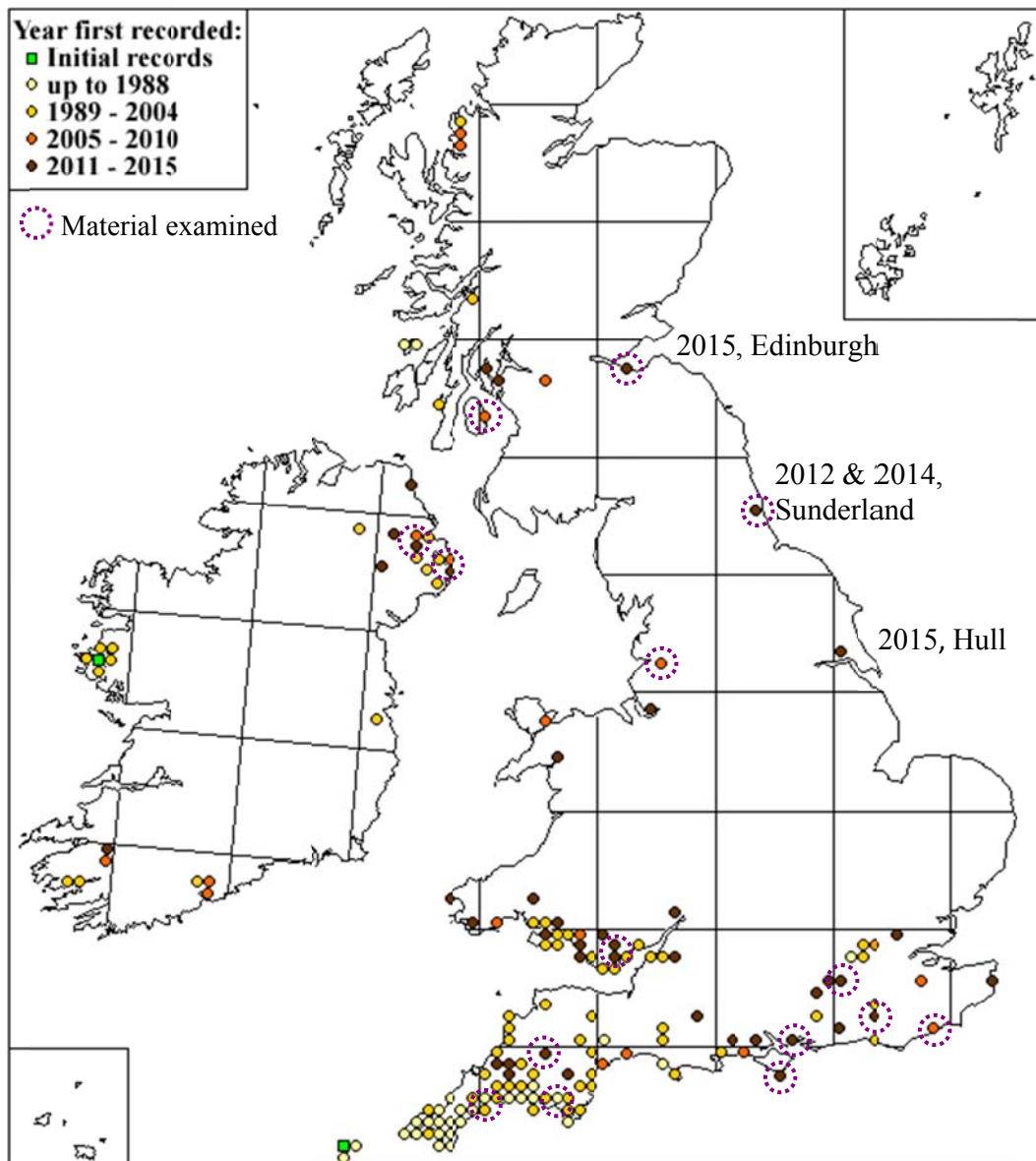
Since 2000 additional records for *A. dorrieni* have been collated by the author through the BMIG Woodlouse Recording Scheme (Gregory, 2000). An updated distribution map was presented by Barber & Gregory (2012). It was apparent that *A. dorrieni* was now well established and locally common in south-west England and south Wales. Elsewhere within its previously known range it appears to be increasing, especially in south-eastern England. In western Scotland it was recorded from the Isle of Arran and from Glasgow on the mainland in 2010 (Gregory, 2016; Hancock, 2012). In Northern Ireland *A. dorrieni* has been widely recorded from ornamental gardens, such as those owned by The National Trust (Roy Anderson, pers. comm.), but there is only a scatter of records elsewhere in Ireland (possibly due to under-recording).

Until 2012 all known records were from the southern or western areas of Britain. In eastern England there were no records of *A. dorrieni* north of the London area. Then in 2012, *A. dorrieni* was first reported from Sunderland, north east England, where it appears to be well established, and in 2015 it was also reported from Hull, Yorkshire, and Edinburgh, south-eastern Scotland (Gregory, 2012; 2015). It is possible that *A. dorrieni* has been over-looked in eastern England. It is apparent that the vast majority of known records remain coastal, where extreme temperatures are ameliorated.

## **DISCUSSION**

*Arcitalitrus dorrieni* is a subtropical species and Richardson (1980) suggested that harsh weather may slow its spread by reducing population size. Harding & Sutton (1988) demonstrated that the then known distribution in Britain and Ireland exhibited a close correlation with mean January 5°C isotherm. The southern and western coasts of Britain experience relatively mild winters and this is where *A. dorrieni* predominantly occurs. Bathed in the relatively warm waters of the North Atlantic drift it is perhaps not unexpected that *A. dorrieni* should colonise western parts of Scotland. It is no coincidence that this is also an area where 'tender' exotic plants were imported to be grown outdoors.

Considering that many of the records from Britain and Ireland are associated with long established ornamental gardens, such as those now managed by the National Trust, it seems likely that the species was initially dispersed widely and inadvertently among exotic plants. In recent decades it is possible that the horticultural trade has become the main vector of dispersal, via garden centres and potted plants. Once established in an area *A. dorrieni* may be carried inadvertently within garden refuse and tipped soil allowing rapid colonisation adjacent areas such as gardens, waste ground, woodland, and a variety of other damp, typically shady, habitats.



**FIGURE 4: Map indicating succession of 10km records for *Arcitalitrus dorrieni* (Hunt) in Britain and Ireland** (i.e. the earliest record in each 10km square is shown).

Based on Harding & Sutton (1988), Cowling, et al (2004) and Barber & Gregory (2012), with additional records submitted to the BMIG Non-marine Isopod Recording Scheme. The first recorded occurrences are Isles of Scilly, 1924, and Co. Galway, 1936.

Its apparent expansion into new areas of Britain and Ireland may be facilitated by climate change. Edinburgh and Sunderland, which are located on the north-east coast of Britain, would seem to be inhospitable places for a subtropical Landhopper. However, both sites occur within built up areas and are close to the coast. Thus, it is likely that adverse weather conditions will be ameliorated by maritime and urban heat-island effects. This is clearly not the complete picture since in Sunderland specimens have been observed to be active during hard frosts or beneath deep snow and rapidly retreat into burrows excavated into the soil when disturbed (Andrew Fox, pers. comm.). It is possible that successive generations of *A. dorrieni* may have become better adapted to the British climate (as suggested by Brey, 2002).

It is plausible that *A. dorrieni* may have been introduced into to Britain and Ireland more than once. However, taking the isolated Scottish record on Colonsay as an example, where *A. dorrieni* was first discovered in 1979, it is known that exotic plants were imported from a variety of countries from the 19<sup>th</sup> Century onwards, but during the 1930s plants were also imported from the Isles of Scilly (Moore & Spicer, 1986). Thus, this seems a highly probable route of initial introduction, supporting the idea that *A. dorrieni* has only been introduced once into Britain and Ireland. Further support for this idea comes from the observation that globally *A. dorrieni* has only been introduced into Britain and Ireland (where exchanges of plant material between estates took place), whereas its close relative, *Arcitalitrus sylvaticus*, has been introduced into California, USA (Lazo-Wasem, 1983) and neither species have been recorded from continental Europe (Cochard, Vilisics & Séchet, 2010).

Whatever its origins, it is clear that the Landhopper, Woodhopper or Lawn Shrimp, *Arcitalitrus dorrieni*, is here to stay.

#### ACKNOWLEDGEMENTS

I am grateful to Tony Barber for his help and encouragement and to Mike Davidson for help with relevant literature. Roy Anderson kindly checked specimens from sites in Northern Ireland using information presented in this paper.

My grateful thanks to all who provided specimens for examination: Tony Barber, Victoria Burton, Sian Evans, Jim Flanagan, Andrew Fox, Dan Hoare, Mike Jones, Stephen Kelly, Angela Lidgett, Keith Lugg, Christian Owen, Paul Richards, Duncan Sivell, Derek Whiteley and Sam Wilcox.

#### REFERENCES

- Barber, A.D & Gregory, S.J. (2012) *Arcitalitrus dorrieni* (Hunt, 1925) Woodhopper, Landhopper, Lawn shrimp. Unpublished presentation for CEH (BRC).
- Bousfield, E.L., (1984) Recent advances in the systematics and biogeography of landhoppers (Amphipoda: Talitridae) of the Indo-pacific region. In *Biogeography of the Tropical Pacific*, ed. F.J. Radovsky, P.H. Raven & S.H. Sohmer. *Bishop Museum Special Publication*. **72**: 171–210.
- Brey, I. (2002) How many legs does an alien have? *Bulletin of the Amateur Entomologists Society*. **61**: 54-56.
- Chevreaux, É. & Fage, L. (1925) *Faune de France 9: Amphipodes*. Paris, Paul Lechevalier. 488pp.
- Cochard, P-O., Vilisics, F. & Séchet, E. (2010) *Alien terrestrial crustaceans (Isopods & Amphipods)*. Chapter 7.1. In Roques, A., *et al* (eds) *Alien terrestrial arthropods in Europe*. *BioRisk*. **4(1)**: 81-96.
- Cowling, J.E., Spicer, J.I., Weeks, J.M. & Gaston, K.J. (2004) Current status of an amphipod invader, *Arcitalitrus dorrieni* (Hunt, 1925) in Britain. *Journal of Natural History*. **38**: 1665-1675.
- Friend, A. (1987) The terrestrial amphipods (Amphipoda: Talitridae) of Tasmania: systematics and zoogeography. *Records of the Australian Museum, Supplement*. **7**: 1–85.
- Gregory, S.J. (2016) BMIG field meeting on Kintyre, 2010: woodlice and millipedes, with additional Scottish records of *Chordeuma sylvestre* and *Leptoiulus belgicus*. *Bulletin of the British Myriapod & Isopod Group*. **29**: 50-58.
- Gregory, S.J. (2015) More on north-eastern Landhoppers *Arcitalitrus dorrieni*. *British Myriapod & Isopod Group Newsletter* No. **31**: 4 (unpublished).
- Gregory, S.J. (2013) More on (semi)-terrestrial amphipods: *Orchestia cavimana*. *British Myriapod & Isopod Group Newsletter* No. **26**: 3 (unpublished).
- Gregory, S.J. (2012) Significant new records for the Landhopper *Arcitalitrus dorrieni*. *British Myriapod & Isopod Group Newsletter* No. **25**: 1 (unpublished).

- Gregory, S.J. (2000) The land-hopper (*Arcitalitrus dorrieni*) in Britain. *British Myriapod & Isopod Newsletter* No. 1: 2 (unpublished).
- Hancock, E. G. (2012) The Australian landhopper, *Arcitalitrus dorrieni* (Hunt, 1925), Crustacea, Amphipoda, in Glasgow. *The Glasgow Naturalist*. **25**: Part 4.
- Harding, P.T. & Sutton, S.L. (1988) The spread of the terrestrial amphipod *Arcitalitrus dorrieni* in Britain and Ireland: watch this niche! *Isopoda* **2**: 7-10.
- Hunt, O. D. (1925) On the amphipod genus *Talitrus*, with a description of a new species from the Scilly Isles, *T. dorrieni* n.sp. *Journal of the Marine Biological Association of the United Kingdom*. **13**: 854-869.
- Hurley, D.E., (1975) A possible subdivision of the terrestrial genus *Talitrus* (Crustacea Amphipoda: Family Talitridae). *Records of New Zealand Oceanographic Institute* **2(14)**: 157–170.
- Ingle, R.W., (1958) A new British record of the amphipod *Talitrus (Talitroides) sylvaticus* (Haswell). *Annals and Magazine of Natural History*, series **13(1)**: 591–592.
- Lazo-Wasem, E.A., (1983) Additional records of the terrestrial amphipod *Arcitalitrus sylvaticus* (Haswell, 1880) in California, U.S.A. *Crustaceana* **45(2)**: 213–214.
- Lincoln, R. J. (1979) *British Marine Amphipoda: Gammaridea*. London: British Museum (Natural History). pp. 685.
- Moore, P.G. & Spicer, J.I. (1986) On the status of *Arcitalitrus dorrieni* (Crustacea: Amphipoda) on the island of Colonsay, Inner Hebrides. *Journal of Natural History*. **20**: 667-680.
- Peart, R., & J. K. Lowry (2006) The amphipod genus *Arcitalitrus* (Crustacea: Amphipoda: Talitridae) of New South Wales forests, with descriptions of six new species. *Records of the Australian Museum* **58(1)**: 97–118.
- Rawlinson, R. (1937) The occurrence of the amphipod *Talitroides dorrieni* Hunt in Co. Galway, Ireland. *Annals and Magazine of Natural History, Series 10* **20**: 589-592.
- Richardson, A.M.M. (1980) Notes on the occurrence of *Talitrus dorrieni* Hunt (Crustacea: Amphipoda: Talitridae) in south-west England. *Journal of Natural History*. **14**: 751-757.
- Welch, R.C. (1981) *Talitroides dorrieni* (Hunt) (Crustacea: Amphipoda) in the Royal Botanic Gardens, Kew, Surrey. *London Naturalist*, **60**: 43-44.

## APPENDIX I

Key to the identification of *Arcitalitrus dorrieni* in Britain and Ireland

- 1) Amphipods with antenna 1 (dorsal) considerably reduced, no more than 1/3 (typically less) the length of, and much narrower than, antenna 2 (ventral) (Figs. 2B & 3A). Eyes circular (Fig. 2A). Telson entire, with no more than a shallow central distal notch (Figs. 2G) ..... **Talitridae 2**
- Amphipods with antenna 1 and 2 similar in size, or the shorter antenna at least 1/2 as long as the longer one. Eyes oval or kidney shaped. Telson divided longitudinally into two parts, at least by a deep central cleft. (Gammaridae & Crangonyctidae) ..... **Aquatic Water-shrimps**
- 2) Antenna 1 relatively long, terminating alongside the basal third of the third peduncle segment of antenna 2 (Fig. 2B). Pleopod 3 greatly reduced, less than 1/2 length of pleopods 1 & 2, either entirely lacking rami (e.g. Fig. 2L) or with inner ramus reduced to a few vestigial segments. Gnathopod 2 never sexually dimorphic. Always found in terrestrial, albeit moist, habitats ..... **Terrestrial Landhoppers 3**
- Antenna 1 relatively short, not reaching beyond the end of the second peduncle segment of antenna 2 (Fig. 3A). Pleopod 3 well developed, at least 2/3 the length of pleopods 2, bearing distinct paired rami. Gnathopod 2 sexually dimorphic (Figs. 3B & 3C), except in *Talitrus saltator*. Typically associated with coastal intertidal or supralittoral habitats, but *C. cavimana* may be found beside watercourses considerably inland ..... **Supralittoral Sandhoppers and Semi-terrestrial Land hoppers**
- 3) Gill 6 with distinct 'pincer-like' apical cleft (Fig. 2I). Pleopods 1 and 2 with inner and outer rami of similar length, as long as or longer than peduncle (Figs. 2J & 2K). Pleopod 3 reduced to vestigial stump, entirely lacking rami (Fig. 2L). Telson with more than 10 robust dorsal setae (Fig. 2G). Widely naturalised outdoors, or inside heated glasshouses ..... ***Arcitalitrus dorrieni***
- Gill 6 of different shape, lacking apical cleft. Pleopods 1 & 2 either have inner rami reduced, much shorter than outer rami or with both rami much shorter than peduncle. Pleopod 3 reduced, with or without short rami. Telson with 8 or less setae. Associated with heated tropical glasshouses ..... ***Brevitalitrus hortulanus*; *Talitroides alluaudi* or *T. topitotum***

## EARLY COUNTY LISTS OF NON-MARINE ISOPODA AND MYRIAPODA FROM CAMBRIDGESHIRE COMPILED BY THE REV. LEONARD JENYNS

Paul T. Harding<sup>1</sup> and A. D. Barber<sup>2</sup>

<sup>1</sup> Centre for Ecology and Hydrology Wallingford, Crowmarsh Gifford, OX10 8BB, UK.

E-mail: [pha@ceh.ac.uk](mailto:pha@ceh.ac.uk)

(Address for correspondence: 60 Boxworth Road, Elsworth, Cambridge, CB23 4JQ, UK.)

<sup>2</sup> Rathgar, Exeter Road, Ivybridge, Devon, PL21 0BD, UK.

E-mail: [abarber159@btinternet.com](mailto:abarber159@btinternet.com)

### INTRODUCTION

A long-term project to transcribe, interpret, annotate and publish the Reverend Leonard Jenyns' unpublished *Catalogue of Cambridgeshire Insects* is being edited by Richard Preece and Tim Sparks. Several of Jenyns' notebooks and manuscripts are now held at the University Museum of Zoology at Cambridge, together with many of his surviving associated specimens. Preece and Sparks (2012) have already published *Fauna Cantabrigiensis* (covering vertebrates and molluscs) and a single volume *Entomologia Cantabrigiensis* is in preparation based on Jenyns original three volume *Catalogue of Cambridgeshire Insects*. We are grateful to Richard Preece and Tim Sparks for permission to publish material relating to Isopoda and Myriapoda, which we and Henry Arnold have helped to interpret and annotate for the project.

### THE REVEREND LEONARD JENYNS (1800-1893)

Preece and Sparks (2012) provide a short biography of Jenyns from which the following summary has been prepared.

Jenyns was the eighth child of the Rev. George Leonard Jenyns of Bottisham Hall, Cambridgeshire. The family was well connected and inherited property including the Bottisham estate. Leonard Jenyns had developed an interest in natural history before going to Eton in 1813 where he acquired a particular fascination with Gilbert White's *A Natural History of Selborne*, which stayed with him in later life. In 1818 Jenyns entered St John's College Cambridge where he came under the influence of J. S. Henslow (Chair of Mineralogy and later Botany at Cambridge). Henslow and Jenyns were jointly responsible for the formation of the Cambridge Philosophical Society's Museum, and in 1823 Henslow married Jenyns' sister Harriet. This period, the 1820s and 1830s, has been regarded as a 'golden age' of natural history in Cambridge. Henslow was an important influence of both Jenyns and the young Charles Darwin, with Jenyns and Darwin gradually developing a friendship which included joint entomological excursions to the fens and the Bottisham area. In 1831, Jenyns was offered, and briefly considered, the role of naturalist with Captain Fitzroy on H.M.S. Beagle, and apparently slightly regretted "his unimaginative decision" to decline in favour of Darwin. Jenyns actively began to publish in 1827, covering a wide range of natural history topics. Perhaps most notable was his monumental *Manual of British Vertebrate Animals*, published in 1835. But the most rigorous and exacting scientific work undertaken by Jenyns is considered to be his work on Darwin's collections of fishes from the Beagle voyage, eventually published in 1842.

Jenyns had been ordained Deacon in London and began a five year curacy at Swaffham Bulbeck near Cambridge, becoming vicar there at the end of 1827. His clerical duties in this small rural parish allowed plenty of time for local natural history. He married in 1844, after which he had less spare time for natural history. His wife's failing health meant that in October 1849, he resigned the incumbency at



Swaffham Bulbeck and they moved to the Isle of Wight and later to the Bath area. From this point onwards Jenyns' work on the natural history of Cambridgeshire was effectively limited to curating his collection and collating his records. Some of his insect collection was presented to the Cambridge Philosophical Society in 1854, and records were assembled into a three volume *Catalogue of Cambridgeshire Insects* in 1868 and 6 volumes of notebooks including the manuscript of *Fauna Cantabrigiensis* in 1869, both of which were deposited at the University Museum of Zoology, Cambridge (Preece & Sparks, 2012).

Leonard Jenyns' life following his move to Bath in 1850 is described by Preece and Sparks (2012), including a full list of his publications. This list is a little surprising in that after 1873 he published as Leonard Blomefield having changed his surname in 1871 to enable him to inherit an estate in Norfolk.

Although the *Catalogue of Cambridgeshire Insects* was sent to Professor Alfred Newton at Cambridge in 1868, it seems probable that the records included in it date mainly from his time in Cambridgeshire, probably beginning in 1818, until his marriage in 1844, or at the latest 1849 when he moved away from Swaffham Bulbeck.

## THE SPECIES LISTS

In the following species lists, we have simplified the approach being taken by Preece and Sparks for publishing the forthcoming *Entomologia Cantabrigiensis* to include the following.

1. The scientific name and authority used by Jenyns (in bold).<sup>1</sup>
2. Jenyns' own comments about the occurrence of the species and related information, these comments are inset, using an italic script font, to distinguish it from the following. For some species Jenyns gives lengths, in inches and lines (abbreviated to inc. and lin., or unc. and lin. in Latin). A line is one twelfth of an inch (2.1 mm).
3. Our interpretation of the name used by Jenyns, following present-day nomenclature.<sup>2</sup>
4. In some cases Jenyns' nomenclature cannot be allocated unambiguously to a single species and in some cases original Latin descriptions are quoted. We comment on the present-day status of the relevant species in Cambridgeshire.

## ISOPODA

### *Asellus aquaticus*, Leach

*Ponds & ditches everywhere.*

*Asellus aquaticus* (Linnaeus, 1758) and/or *Proasellus meridianus* (Racovitza, 1919).

*P. meridianus* was not described as a separate species until 1919. *Asellus* specimens in British collections from before 1919 are known to include both species. Both species occur widely in the county, although the latter is possibly less widespread. Both species occupy similar freshwater habitats.

---

<sup>1</sup> Jenyns' manuscript is inconsistent in how authorities are cited and whether dates are included. We have retained these inconsistencies.

<sup>2</sup> Full authority names and dates are included. The following sources were used: Isopoda – Gregory (2009); Diplopoda – Lee (2006); Chilopoda (Geophilomorpha) – Bonato & Minelli (2014), Chilopoda (lithobiids) – Chilobase.

***Philoscia muscorum*, Latr.**

*Under stones & in mosses, common.*

*Philoscia muscorum* (Scopoli, 1763).

Still common in the county.

***Philoscia* ?**

*Seven specimens in the collection of what appears to me to be a distinct species from the above. It is invariably of a brick red colour, & never attains to above one fourth of the size of *P. muscorum*. Not uncommon in rotten wood, & damp places.*

Unknown.

Possibly a *Trichoniscus* species. Given the habitat, it is unlikely to be *Androniscus dentiger* Verhoeff, 1908.

***Oniscus asellus*, Linn.**

*In rotten wood, old walls, & under the bark of trees, very common.*

*Oniscus asellus* Linnaeus, 1748.

Still very common.

***Porcellio scaber*, Latr.**

*In the same places as the last & equally abundant.*

*Porcellio scaber* Latreille, 1804.

Still very common.

***P. variegatus*, Jenyns**

*This appears to me to be a distinct species from the last, differing in the shape of the caudal styles, & in colour. The body is more variegated, & the head black. I first found a specimen at Bottisham, & afterwards observed it in great plenty under old tiles, stones, & other rubbish, at the foot of one of the Stables on Newmarket Heath.*

Probably a *nomen nudum*.

From the description and habitat possibly *Porcellio spinicornis* Say, 1818, which was added to the British list in 1868.

***P. laevis*, Latr.**

*Under stones, & in outhouses, Bottisham Hall: less common than *P. scaber*.*

*Porcellio laevis* Latreille, 1804.

A synanthropic species, usually associated with stables, cattle barns, large dung heaps and mature gardens. It is probably less common now than it appears to have been during the 19<sup>th</sup> century.

***Armadillo vulgaris*, Latr.**

*In moss, & under stones, common. N.B. This genus requires examination. I suspect there are two or three species confounded under the name of *A. vulgaris*. Three specimens in the collection, from*

*Newmarket Heath, appear very distinct. They are much smaller than usual, more varied in colour, with the ground inclining to a yellowish tinge.*

Probably *Armadillidium vulgare* (Latreille, 1804).

*Armadillidium vulgare* is the only one of the six British *Armadillidium* species that is recorded widely in Cambridgeshire. The small specimens from Newmarket Heath are intriguing because they could possibly have been *A. pulchellum* (Zencker, 1798), which has been recorded from a few lowland heaths in south-eastern England but is more common in western Britain.

## MYRIAPODA - DIPLOPODA

### ***Julus sabulosus*, Leach, Zool. Misc. vol. 3. p. 33.**

*Two specimens found under stones, in Whitewood, Gamlingay. Also on the Devil's Ditch. Length 1 inc. 4 lin.*

*Ommatoiulus sabulosus* (Linnaeus, 1758).

A very distinctive species with its pair of dorsal red-orange longitudinal lines and upturned telson tip (Leach: *Jul. nigro-cinereus lineis duabus dorsalibus rufescentibus, segmento ultimo mucronato, pedibus luteus*) and is unlikely to be confused with any other British form. Recorded mainly on light or sandy soils at a few sites in Cambridgeshire.

### ***J. niger*, Leach, Zool. Misc. 3. 34.**

*With the last at Gamlingay. Found also at Bottisham. ~ Length 1 inc. 6 lin.*

*Tachypodoiulus niger* (Leach, 1815).

A large, common and distinctive British species, also with an upturned tip to the telson (Leach: *J. segmento ultimo mucronato*). Recorded widely in Cambridgeshire.

### ***J. punctatus*, Leach, Zool. Misc. 3. 34.**

*One specimen taken at Bottisham, but not in the collection; accidentally destroyed.*

*Cylindroiulus punctatus* (Leach, 1815).

*C. punctatus* has been recorded at several sites in Cambridgeshire, often in woodland. It is probably one of the most commonly found British millipedes and is characteristic of woodland sites. A relatively light brown animal with darker repugnatorial glands along the body and a distinctive telson (Leach: *J. segmento ultimo mucronato....*)

### ***J. pusillus*, Leach, Zool. Misc. 3. 35.**

*Common at Bottisham in rotten wood.*

Uncertain, possibly *Brachyiulus pusillus* (Leach, 1815) which is fairly distinct and which Leach described as *J. segmento ultimo submucronato, corpore cinerascete-nigro aut fusco-brunneo, dorso lineis duabus rufescentibus*.

*B. pusillus* has been recorded at a few sites in Cambridgeshire. It is usually associated with clay soils, and is often found in pastures and agricultural land. It is rarely a species of rotten wood in our experience, indeed Lee (2006) indicates that analysis of habitat data suggests a strong negative relationship with woodland.

***Craspedosoma polydesmoides*, Leach, Zool. Misc. 3. 36. t. 134. fig. 6.**

*Common at Bottisham under bark, &c. and in rotten trees.*

*Nanogona polydesmoides* (Leach, 1814).

Recorded widely in Cambridgeshire and occurs in a wide range of habitats.

***Polyxenus lagurus*, Latr. Leach, Zool. Misc. 3. 38. t. 135. B.**

*Very common, inhabiting the same places as the last.*

*Polyxenus lagurus* (Linnaeus, 1758).

This small and unmistakable millipede has been recorded at a few scattered sites in Cambridgeshire, the nearest locality to Bottisham being at Wicken Fen.

**MYRIAPODA - CHILOPODA*****Lithobius variegatus*, Leach ? Zool. Misc. 3. p. 40.**

*I am not sure that this is the *Lith. variegatus* of Leach, but it is quite distinct from the next species, always much smaller, as well as darker in colour. It inhabits the same places, &c. is far from uncommon at Bottisham.*

Uncertain – could be one of several *Lithobius* species.

*L. variegatus* (Leach, 1814) in life is very distinct with variegations (Leach: *pedibusque variegatus nec coloribus*) which are lost on preservation. It is probably uncommon or absent in Cambridgeshire, as in much of eastern England, although it was recorded commonly at Monks Wood in former Huntingdonshire (Welch, 1969) and at the same location in 2013 (Calum Urquart, pers. comm.). Given Jenyns' description it is likely to be another *Lithobius* species because *L. variegatus* is similar in size to *L. forficatus* and even in the preserved state is hardly darker in colour. *L. melanops*, which was not described until Newport's 1845 account, tends to be relatively light in colour with a distinct darker longitudinal band dorsally. Likely possibilities for a smaller, dark species (other than an immature *L. forficatus*) are *L. crassipes* (described by Koch in 1862), which is common in eastern England, or one of the other smaller *Lithobius* species.

***L. forficatus*, Newport. – *L. vulgaris* Leach**

*Common everywhere, under stones, &c.*

*Lithobius forficatus* (Linnaeus, 1758).

Chilobase includes *Lithobius vulgaris* Leach, 1817 as a synonym of *L. forficatus* (Linnaeus, 1758). *L. forficatus* is the common, large brown *Lithobius* species of most of Britain.

***Arthronomalus longicornis*, Newp. in Linn. Trans. vol. 19. p. 430.**

*Not uncommon at Bottisham, Quy, Cambridge, &c. Distinguished from all the other indigenous species of this family by the length of the antennae.*

*A. longicornis* = *Necrophloeophagus longicornis* (Leach, 1815) = *Geophilus flavus* (De Geer, 1778).

*Geophilus flavus* (De Geer, 1778), as it is now known, is a common and widespread species, with characteristic long antennae.

***A. carpophagus*, Newp. Linn. Trans. 19. 432.**

*Gardens, &c. not uncommon, feeding on decayed fruit.*

*Geophilus carpophagus* was described by Leach (1815) although he did not include an indication of the number of leg-bearing segments. Newport (1845) whom Jenyns cited as authority reported that there were three specimens in the British Museum, in too bad a condition to be correctly described as for colour. One had 51 leg bearing segments. It is now recognised that there are two similar species in Britain, *G. carpophagus* Leach, 1815 *sensu strictu* and *Geophilus easoni* Arthur *et al*, 2001. In principle, Jenyns' species could be either species although the habitat suggests the former; *G. carpophagus* *ss* is frequently associated with buildings, whilst *G. easoni*, the smaller of the two forms, tends to occur in woodland and moorland. Reports of an association with fruit go back to Leach and indeed this is reflected in the name.

***A. maritimus*, ~ *Geoph. maritimus*, Leach, Zool. Misc. 3. p. 44. tab. 140. fig. 1, 2. ??**

*Brunneo- ferrugineus, lateribus violascentibus, capita antennisque ferrugineis, ano pedibusque subflavidis, pedum paribus circiter 51. Long. vix 2 unc. I have referred this to the Geophilus maritimus of Leach, provisionally, but am doubtful whether it be really the same as that species, or whether it may not be a mere variety of A. carpophagus, from which it scarcely differs except in colour. One specimen only is in the collection, taken under stones in Whitewood, Gamlingay.*

This cannot be *Strigamia maritima* (Leach, 1817) which occurs only on the coast and in tidal estuaries. *Strigamia crassipes* (C.L.Koch, 1835) has 49-53 leg pairs and *Geophilus easoni* has 47-51 leg pairs. Both are reddish-brown species, unlike many other British geophilomorpha, which are often yellowish or whitish, so possibly it is one of these. *Geophilus carpophagus* *ss* can also have as few as 51 leg pairs.

***A. gigas*, Jenyns**

*lavus, capite, antennisque, anoque ferrugineis, mandibulorum apicibus, unguibusque nigris; corpore crasso, pedum paribus 55. Long. 2 unc. 6 lin. This appears to me to be a distinct species from all those described by Leach or Newport; characterized by its pale yellow colour, & very stout body (of the same size throughout) compared with its length. One specimen taken in a garden at Cambridge.*

*Nomen nudum.* We cannot refer this to any clearly recognisable British species if, indeed, the colour and leg numbers are correct. Species that might be described as pale yellow and very stout body and likely to be found in gardens include *Stenotaenia linearis* (C.L.Koch, 1835), *Geophilus electricus* (Linnaeus, 1758) and *Haplophilus subterraneus* (Shaw, 1794) but these all have more than 55 leg pairs. Of yellowish species that can have 55 pairs, there is the pale yellow but elongate rather than stout *Geophilus alpinus* Meinert, 1870 and *Geophilus flavus* (above). The pale *Henia brevis* (Silvestri, 1896) with 53-57 pairs is elongate rather than stout whilst *Geophilus osquidatum* Brölemann, 1909 is mostly found in western Britain.

A species named *Geophilus gigas* was described from Iran by Attems in 1951.

***Geophilus acuminatus*, Leach, Zool. Misc. 3. p. 45.**

*Occasionally met with in the Shrubbery at Bottisham Hall, under stones, &c. Length 1 inc. 6 lines. Three specimens in the collection.*

Probably *Strigamia acuminata* (Leach, 1815):

This species occurs widely in Cambridgeshire. Leach in his descriptions of this species does not seem to give the number of leg pairs, so the possibility of it being the similar species *Strigamia crassipes* (C.L.Koch, 1835) cannot be excluded.

### ***G. complanatus*, Jenyns.**

*Ferrugineus; corpore valde depresso, posticè lato, anticè attenuato; pedum paribus 51. Long. 1 unc. 3 lin. Apparently an undescribed species, distinguished from the last by its greatly depressed body, dilated behind, & more numerous pairs of feet. One specimen taken at Bottisham, & highly luminous.*

*Nomen nudum.* We cannot be sure which species is being referred to here. Segment number and colour suggest *Strigamia crassipes* or *Geophilus easoni*. Males of *S. crassipes* have very much dilated last legs indicating the former, but we are not aware of this synonym for that species and it does not occur in Chilobase. Several species of British geophilomorphs have been reported at various times as luminous including *S. crassipes*.

### ***G. electricus*, Jenyns**

*Flavo-fulvescens; capite antennisque saturatioribus; hæ articulis apice pallidis; pedibus flavis; pedum paribus circiter 50. Long. 1 unc. 3 lin. Somewhat depressed, body rather narrower towards the anterior extremity: head fulvous, with the mouth paler; antennæ with the apex of each articulation sensibly pale. Body nearly of one uniform yellowish fulvous colour, with the anus & underside paler, but free from any tinge of brown or violet; feet pale yellow with the ungues dark. On the upper surface of the body a longitudinal line on either side rather of a deeper colour than the rest of the body, but no abbreviated impressed lines on the segments.*

*The above description is taken from three specimens in the collection ~ (numbered 117, 118, 119, on blue paper) all of which were taken together on the night of Sept. 8, 1831, by the roadside between Bottisham and Swaffham, shining brilliantly. A fourth specimen, without a number, was taken elsewhere, the exact locality not known, & possibly may be different. ~ Perhaps, however, it may be questioned whether any of them are specifically distinct from the *G. complanatus* last described? I have called this species *Electricus*, but I am not sure that it is the *Scolopendra electrica* of authors.*

*Nomen nudum.* This is definitely not the *Geophilus electricus* of Linneaus if the leg numbers are even approximately correct (all geophilomorpha have an odd number of pairs in practice). The true *G. electricus* has between 65 and 73 pairs and, in fact, despite its name, there is some doubt as to whether it is luminous. Barber (2014) noted that caution is needed in interpreting older records of “*Geophilus electricus*”. What, in fact, is being referred to here is obscure. *G. carpophagus* sl is known to be luminous sometimes (as are also *Haplophilus subterraneus* and *Geophilus flavus*) but the colour is quite wrong. On the author’s own descriptions, this is distinct in colour from his *G. complanatus* but *S. crassipes* (which that may be) can show luminescence.

### ***Geophilus subterraneus*, Leach, Newport.**

*Very common in gardens, often turned up with the spade.*

In the absence of any diagnostic characters being given, we cannot be absolutely certain that this is *Haplophilus subterraneus* (Shaw, 1794) but that species is often dug up in gardens. Leach (1817) describes it as *Habitat in Angliæ hortis*.

## CONCLUSIONS

Given that Jenyns' field work in Cambridgeshire could not have been any later than 1849 and his work on collating his records no later than 1868, it is clear that his knowledge of Isopoda and Myriapoda was up-to-date. This would not be remarkable if these taxonomic groups were his principal interest, but, as has been shown in *Fauna Cantabrigiensis* and will be in the *Entomologia Cantabrigiensis* volume when published, Jenyns covered many faunal groups with considerable depth of knowledge.

In the case of the Isopoda, his list is probably the earliest county list to be compiled, but it was not published at that time, so the first published county lists are probably those for Devon by Stebbing (1874, 1879).

As with Isopoda, work on compiling lists of British millipedes and centipedes began with the work of W.E. Leach (1790-1836). Clearly Jenyns is using Leach as one of his principal references and indeed all the millipedes are actually referred to Leach's *Zoological Miscellany* (1817). For centipedes he uses both that source along with work by George Newport (1803-1854) notably his *Linnean Society Transactions* monograph (1845) as well as adding species of his own naming. It is possible to be reasonably certain as to which millipedes he is referring to but with the centipedes correlation with presently known species varies from clearly identifiable types to almost completely obscure ones, as is indicated in our comments for each. There are several cases where the species name used by Jenyns (as the author of the species) is not a valid name, has never been properly published or lacks sufficient descriptive information to satisfy the criteria for availability. We have recorded these as being *nomina nuda*, although they may also be *nomina non rite publicatum* i.e. not properly published names.

There are several species of myriapod that we might have expected to be included. For millipedes, these could include *Glomeris marginata* (Villers, 1789) and *Polydesmus angustus* Latzel, 1884, both of which are included in the Leach *Zoological Miscellany* (the latter as *Polydesmus complanatus* from which it was subsequently separated). For centipedes, with the confusion of names, it is more difficult although perhaps it is surprising that *Cryptops hortensis*, described by Donovan in 1810 and also included in Leach's account, was not found.

For myriapods, credit for the first "county list" should be given to George Johnston (1835) for his list for Berwickshire. The first English list published for a specific county would seem to be that of Parfitt (1874) for Devon although there had been a list for the Falmouth area of Cornwall published by Cocks more than twenty years earlier (Cocks, 1849, 1851).

## ACKNOWLEDGEMENTS

We are grateful to Richard Preece and Tim Sparks for permission to publish this paper in advance of completion their work on *Entomologia Cantabrigiensis*, and to Duncan Sivell for comments on a draft of this paper.

## REFERENCES

- Arthur, W., Foddai, D., Kettle, C., Lewis, J.G.E., Luczynski, M. & Minelli, A. (2001) Analysis of segment number and enzyme variation in a centipede reveals a cryptic species, *Geophilus easoni* sp. nov., and raises questions about speciation. *Biological Journal of the Linnean Society*. **74**: 489-499.
- Barber, A.D. (2014) Early records and names of British & Irish centipedes. *Bulletin of the British Myriapod and Isopod Group*. **27**: 43-52.
- Bonato, L. & Minelli, A. (2014) Chilopoda Geophilomorpha of Europe: a revised list of species with taxonomic and nomenclatorial notes. *Zootaxa*. **3770** (1): 1-136.

Chilobase. (<http://chilobase.bio.unipd.it/>)

Cocks, W.P. (1849) Contributions to the Fauna of Falmouth. *Ann. Rept. Roy. Cornwall Polytechnic Soc.* **17**:38-102.

Cocks, W.P. (1851) Contributions to the Fauna of Falmouth. *Ann. Rept. Roy. Cornwall Polytechnic Soc.* **19**:12-22.

Johnston, G. (1835) A descriptive Catalogue of the Insécta Myriápoda found in Berwickshire. *Loudon`s Magazine of Natural History.* **8**: 486-494.

Leach W.E. (1815) A tabular View of the external Characters of Four Classes of Animals, which Linné arranged under Insecta; with the Distribution of the Genera composing Three of these Classes into Orders &c. and Descriptions of several New Genera and Species. *Trans. Linn. Soc.* **11**(2): 306-400.

Leach, W.E. (1817) Class Myriapoda. *Zool. Misc.* **3**: 31-45.

Lee, P. (2006) Atlas of the Millipedes (Diplopoda) of Britain and Ireland. Sofia-Moscow: Pensoft Publishers.

Newport, G. (1844/45) Monograph on the Myriapoda Chilopoda; with Observations on the General Arrangement of the Articulata. *Trans. Linn. Soc.* **19**:265-302 (1844), 349-438 (1845).

Parfitt, E. (1874) Fauna of Devon Part XI. Myriopoda, etc. *Trans. Devonshire Assn.* **6**:716-727.

Preece, R.C. & Sparks, T.H. editors (2012) Fauna Cantabrigiensis: The vertebrate and molluscan fauna of Cambridgeshire by the Rev. Leonard Jenyns (1800-1893): transcript and commentaries. London: Ray Society.

Stebbing, T.R.R. (1874) The sessile-eyed Crustacea of Devon. *Trans. Devonshire Assn. Advmt Sci.* **6**: 764-773.

Stebbing, T.R.R. (1879) Sessile-eyed Crustacea of Devonshire, Supplementary List. *Trans. Devonshire Assn. Advmt Sci.* **11**: 515-524.

Welch, R.C. (1969) Myriapoda from Monks Wood National Nature Reserve. *Rep. Huntingdon. Fauna Flora Soc.* **21<sup>st</sup>** (1968): 24-27.



## IS *PORCELLIO LAEVIS* (LATREILLE) DECLINING IN BRITAIN AND IRELAND?

Paul T. Harding

Centre for Ecology and Hydrology Wallingford, Crowmarsh Gifford, OX10 8BB, UK.

Email: [pha@ceh.ac.uk](mailto:pha@ceh.ac.uk)

Address for correspondence: 60 Boxworth Road, Elsworth, Cambridge CB23 4JQ, UK.

### ABSTRACT

The cosmopolitan woodlouse, *Porcellio laevis* (Latreille) is large and distinctive, and was formerly recorded widely in Britain and Ireland, mainly in urban and strongly synanthropic situations. In recent decades the species has been recorded in a decreasing number of localities. In this paper possible explanations for this apparent decline are explored, including the progressive loss of suitable synanthropic sites associated with domestic cattle and horses. Alternative synanthropic sites in old, traditionally-managed, walled gardens may also be important for this species.

### INTRODUCTION

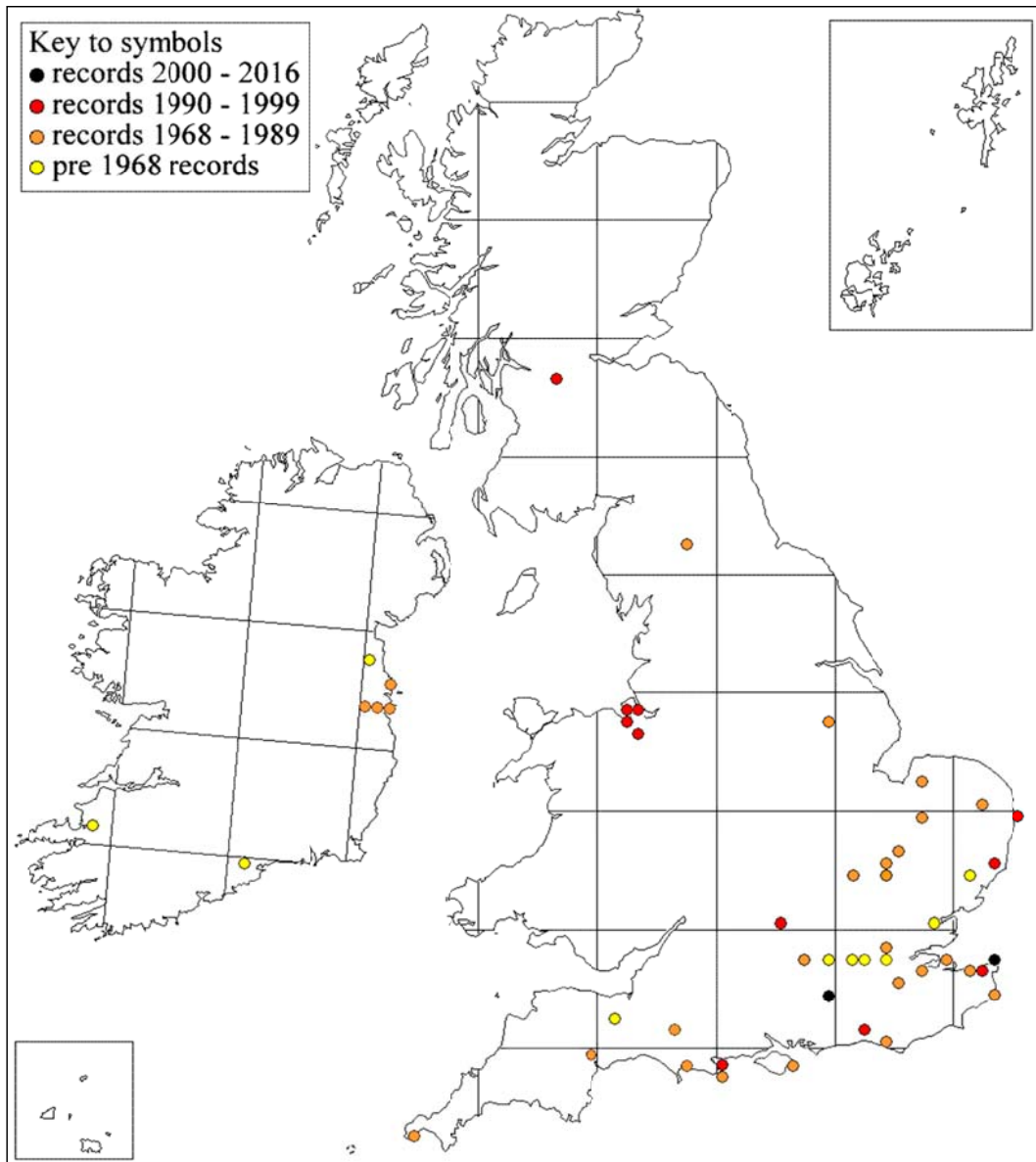
*Porcellio laevis* (Latreille, 1804) is a large and distinctive woodlouse, up to 20mm long with a smooth dorsal surface and, in the male, long uropods.

Vandel (1962) and Schmalzfuss (1998) place *P. laevis* as a characteristic representative of a distinctive North African group of *Porcellio* species. It is now a cosmopolitan species, spread widely throughout the world, including North and South America, Western Asia, Japan, Australia and some Pacific islands, resulting in a complex synonymy (Schmalzfuss, 2003). In the region of its probable natural origin, North Africa, it has been recorded at altitudes up to 2000 metres, and in southern France (Alpes-Maritime) at over 1000 metres (Vandel, 1962). It occurs in many parts of the rest of Europe but is normally regarded as a cosmopolitan species (cf. Taiti & Ferrara, 1989). It has been recorded in parts of northern Europe, to southern Sweden and Denmark, but always in close association with human habitations and farms. Even in hotter climates, such as India, it seems to occur as an anthropophile (Nair, 1984). As a widespread, cosmopolitan species, it has attracted some interest in relation to genetic variation for plasticity in physiological and life-history traits (Lardies & Bozinovic, 2008).

*P. laevis* is clearly a synanthropic species in Britain and Ireland (Harding & Sutton, 1985; Gregory, 2009). However, our contact with this species appears to have declined for several decades. This apparent decline in records of *P. laevis* in Britain and Ireland may be merely a result of changed priorities among recorders, but, in this paper I suggest other possible reasons for decline. The known distribution of *P. laevis* in Britain and Ireland is summarised in Fig.1.

### RECORDS

The first record of *P. laevis* from Britain is from the late 13th century. Although identifiable evidence of woodlice is rarely found in archaeological deposits, 'sub-fossil' remains of *P. laevis* were recorded from a medieval infill pit at Stonar, East Kent (Girling, 1979). The processes by which such remains were preserved in an archaeological context are described by Girling, involving the permeation of calcium carbonate into the exoskeleton in hard water, waterlogged conditions.



**FIGURE 1: Map indicating distribution of *Porcellio laevis* (Latreille) in Britain and Ireland (plotted at 10km resolution)**

Given its large size, distinctive appearance and synanthropic associations, it is perhaps not surprising that *P. laevis* was one of the first species of woodlice to be recognised in Britain and Ireland. Robert Templeton (1836) listed five species of woodlice from Ireland from the papers of his late father, John Templeton (1766-1825). Leach (1814)<sup>3</sup> listed six species of woodlice from “Britain”, noting that *P. laevis* was rare, referring to a single specimen taken by him in Devon. Bate and Westwood (1868) stated that it occurred commonly in stable-litter in England and Ireland but, from their description, it is possible that some of their *P. laevis* records may refer to *Cylisticus convexus* (De Geer, 1778). Examination of museum collections (Harding, 1977a,b) suggested that confusion with *C. convexus* was also experienced by W.E. Collinge and R.A. Phillips or D.R. Pack-Beresford.

<sup>3</sup> There is uncertainty about the precise date of Leach’s list in The Edinburgh Encyclopaedia, which was published in parts. It could be as late as 1830.

Notwithstanding these confused identifications, subsequent authors (up to and including Edney, 1954) recorded *P. laevis* as common or at least widespread, usually associated with stables and farms, and “among vegetable rubbish near human dwellings” (Webb & Sillem, 1906). But these observations were probably based on records from south-east England and around cities in Ireland. Later authors (Sutton, 1972; Doogue & Harding, 1982; Harding & Sutton, 1985; Hopkin, 1991; Oliver & Meechan, 1993; Gregory, 2009) remarked on the fact that, although obviously a synanthropic species, often associated with farms and dung- and compost-heaps, *P. laevis* has appeared to be less frequently recorded. Indeed, until 2016 the most recent field records were from the Wirral in 1995, Glasgow, southern Scotland in 1996 and Margate, Kent in 2007 (Steve Gregory, pers. comm.).

A highlight of the BMIG Annual Meeting at Juniper Hall, Surrey in 2016 was the discovery of an apparently thriving population of *P. laevis* in the middle of Guildford, Surrey (Flanagan, 2016).

### **PORCELLIO LAEVIS, LIVESTOCK NUMBERS AND HUSBANDRY PRACTICES**

The early recognition of *P. laevis* in Britain and Ireland almost certainly relates to the particular synanthropic associations of the species in northern latitudes. The available evidence suggests that where any form of habitat information has been documented in publications or in modern records, stables, farms, dung heaps and gardens predominated. Early records appeared to be mainly from cities and towns, although this may be a partial artefact of the way records were summarised. However, the thermal effect of cities may have been a contributory factor in the occurrence of *P. laevis*.

In the second half of the 19<sup>th</sup> century and throughout 20<sup>th</sup> century there were considerable changes in the numbers and distribution of cattle and horses. Dairy cows were commonly kept within large cities until efficient rail transport enabled fresh milk to be brought in from the surrounding countryside. Taylor (1971) estimated that in the mid-19<sup>th</sup> century there were 24,000 cattle in London, but this number had possibly halved by 1865 when the viral disease rinderpest (cattle plague) spread throughout Britain. Similarly, horses were abundant in cities for all forms of transport until World War I, and their use in agriculture continued into World War II. Estimates vary regarding the number of horses in Victorian Britain – over 3 million has been suggested, but Brassley (2000) concluded that by 1909 there were 1.1 million, by 1946 this had halved to 545,000, and by 1960 the total number of horses had reduced to 54,000. During the 20<sup>th</sup> century the number of tractors increased from 500 (in 1909) to an estimated 500,000.

Thus, by the 21<sup>st</sup> century, contact with urban cattle had been lost and numbers of horses had reduced to under 2% of that in Victorian times, and these too are almost exclusively rural. If formerly *P. laevis* was mainly associated with stables and cow yards, particularly in urban settings, it would appear to have undergone a major decline in habitat availability. But that may not be the only factor in limiting habitat availability and opportunities for passive dispersal in rural settings. Agricultural methods and equine practices have become increasingly sophisticated since World War II. The introduction of powerful helminthicides and other biocides has increased the ‘sterility’ of dung, and storage of slurry and dung is now carefully managed and subject to regulation.

### **DISCUSSION**

Despite the apparently isolated record in 2016, we seem to have progressively lost contact with *Porcellio laevis* in Britain and Ireland. This is surprising for what was one of the first six species of woodlice to be recorded here (Leach, 1814). For over 100 years it was recorded as common, and being a large and distinctive, surface living species it is not easily overlooked. Are isopodologists just not looking for it or has the species declined?

The habitat of *P. laevis* is poorly defined, but it appears to be strongly synanthropic, associated mainly with stables, cattle yards and dung heaps and occasionally with compost heaps and old, enclosed gardens. With the exception of the last two, its habitats have declined as numbers of horses have shrunk and cattle husbandry has modernised. In contrast, the other classic compost heap species, *Porcellionides pruinosus*, seems able to disperse and maintain populations (Gregory, 2009) and is comparatively well recorded.

Even if a good dung heap from an organic herd of dairy or beef cattle can be found, the prospects of a passing isopodologist gaining access to it will probably be limited by modern farm biosecurity. Security and biosecurity can also greatly restrict access to stables with any more than a few riding ponies.

The recent discovery of *Porcellio laevis* in the long-established walled garden of the former Allen House Mansion at Guildford (Flanagan, 2016) highlights a potentially important habitat for the species. Although the conditions and historical context described for the Guildford locality may in themselves be uncommon, it would certainly be worth surveying other large, old, well-established and continuously managed gardens and, in particular, walled gardens. A similar record from Oxford in the 1990s was from a compost heap in an entirely enclosed, walled domestic garden in the city centre (Gregory & Campbell, 1995).

*Porcellio laevis* would appear to be much less common than a century ago. This may be due to a decline in habitat availability and suitability caused, for example, by modern agricultural and equine management practices. This is a species for which negative records would be both practicable and useful – where a search was made and the species was not found.

#### ACKNOWLEDGEMENTS

I am grateful to Steve Gregory for details of records of *P. laevis* and for the distribution map, to Tony Barber for comments on an earlier draft and to Jim Flanagan for discussions about the Guildford record in 2016.

#### REFERENCES

- Bate, C.S. & Westwood, J.O. (1868) *A history of the British sessile-eyed Crustacea, Vol. 2*. London: John van Voorst.
- Brassley, P. (2000). Output and technical changes in twentieth century British agriculture. *Agricultural History Review*, **48**: 60-84.
- Doogue, D. & Harding, P.T. (1982) *Distribution atlas of woodlice in Ireland*. Dublin: An Foras Forbartha.
- Edney, E.B. (1954) *British woodlice, with keys to the species*. Linnean Society of London Synopses of the British fauna, No. **9**.
- Flanagan, J. (2016) A new record of the woodlouse *Porcellio laevis* from Allen House Grounds in Guildford, Surrey. *British Myriapod and Isopod Group Newsletter*, No. **33** (unpublished).
- Girling, M.A. (1979) Calcium carbonate-replaced arthropods from archaeological deposits. *Journal of Archaeological Science*, **6**, 309-320.
- Gregory S. (2009) *Woodlice and Waterlice (Isopoda: Oniscidea & Asellota) in Britain and Ireland*. Shrewbury: Biological Records Centre/Field Studies Council.
- Gregory, S.J. & Campbell, J.M. (1995) An atlas of Oxfordshire Isopoda: Oniscidea. *Oxfordshire Museums Service Occasional Paper* No. **17**. 19pp. Oxfordshire County Council.
- Harding, P.T. (1977a) A re-examination of the work of W.E. Collinge on Woodlice (Crustacea, Isopoda, Oniscoidea) from the British Isles. *Journal of the Society for the Bibliography of Natural History*, **8**, 286-315.

- Harding, P.T. (1977b) *A catalogue of the woodlice (Crustacea, Isopoda, Oniscoidea) from Ireland and Britain in the collection of the National Museum of Ireland, Dublin*. Unpublished report to the National Museum of Ireland and the Royal Irish Academy.
- Harding, P.T. & Sutton, S.L. (1985) *Woodlice in Britain and Ireland: distribution and habitat*. Huntingdon: Institute of Terrestrial Ecology.
- Hopkin, S.P. (1991) *A key to the woodlice of Britain and Ireland*. AIDGAP, Field Studies Council Publication No. 2014. Shrewsbury: Field Studies Council. (Reprinted from *Field Studies*, **7**, 599-650.)
- Lardies, M.A. & Bozinovic, F. (2008) Genetic variation for plasticity in physiological and life-history traits among populations of an invasive species, the terrestrial isopod *Porcellio laevis*. *Evolutionary Ecology Research*, **10**, 747-762.
- Leach, W.E. (1814) Crustaceology. In: Brewster, D. (editor) *The Edinburgh Encyclopaedia*, **7**, 383-437.
- Nair, G.A. (1984) Breeding and population biology of the terrestrial isopod *Porcellio laevis* (Latreille), in the Delhi region. In: Sutton, S.L. & Holdich, D.M. (editors) *The Biology of Terrestrial Isopoda*. Zoological Society of London Symposia, No 53. Oxford: Clarendon Press.
- Oliver P.G. & Meechan, C.J. (1993) *Woodlice*. Synopses of the British Fauna (New Series) No. 49. Shrewsbury: Field Studies Council.
- Schmalfuss, H. (1998) The terrestrial isopod fauna of the central Near East: composition and biogeography. *Israel Journal of Zoology*, **44**, 263-271.
- Schmalfuss, H. (2003): World catalog of terrestrial isopods (Isopoda: Oniscidea). Stuttgarter Beitrage zur Naturkunde, Serie A, Nr. 654: 341 pp.  
Updated as [http://www.oniscidea-catalog.naturkundemuseum-bw.de/Cat\\_terr\\_isop.pdf](http://www.oniscidea-catalog.naturkundemuseum-bw.de/Cat_terr_isop.pdf)
- Sutton, S.L. (1972) *Invertebrate Types: Woodlice*. London: Ginn.
- Taiti, S. & Ferrara, F. (1989) Biogeography and ecology of terrestrial isopods from Tuscany. In: Ferrara, F. (editor) *Proceedings of the second symposium on the Biology of terrestrial isopods*. *Monitore zoologico italiano*, N.S. Monographia, **4**, 75-101.
- Taylor, D. (1971). London's milk supply 1850-1900: a reinterpretation. *Agricultural History*, **45**: 33-38.
- Templeton, R. (1836) Catalogue of Irish Crustacea, Myriapoda and Arachnida, selected from the papers of the late John Templeton, Esq. *Loudon's Magazine of Natural History*, **9**, 9-14.
- Vandel, A. (1962) *Isopodes terrestres (Deuxieme partie)*. (*Faune de France* No.66). Paris: Lechevalier.
- Webb, W.M. & Sillem, C. (1906) *The British Woodlice*. London: Duckworth.

**CYLINDROIULUS APENNINORUM (BRÖLEMANN, 1897) (DIPLOPODA, JULIDA: JULIDAE) NEW FOR THE UK FROM THE ISLE OF WIGHT AND SOUTH DEVON**

Anthony D. Barber<sup>1</sup> & Helen J. Read<sup>2</sup>

<sup>1</sup> Rathgar, Exeter Road, Ivybridge, Devon, PL21 0BD, UK

E-mail: [abarber159@btinternet.com](mailto:abarber159@btinternet.com)

<sup>2</sup> 2 Egypt Wood Cottages, Egypt Lane, Farnham Common, Bucks. SL2 3LE. UK.

E-mail: [helen@helen-read.co.uk](mailto:helen@helen-read.co.uk)

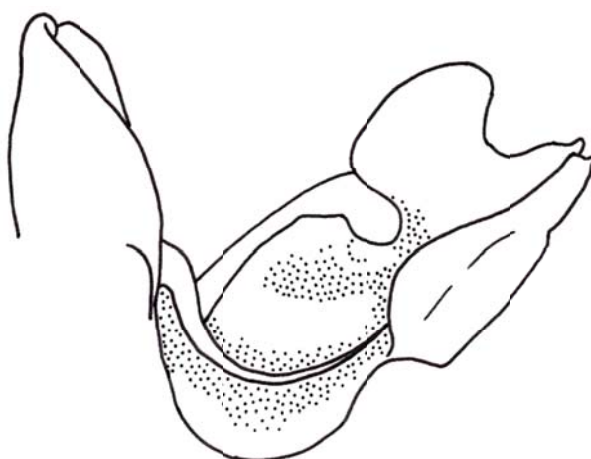
**INTRODUCTION**

During a collecting trip to Ventnor Botanical Gardens on the Isle of Wight by one of us (ADB) in September 2015 a species of millipede previously unknown from the UK with a very obviously projecting telson and ventral scale (similar to that in *Enantiulus armatus*) was found. Specimens were confirmed by Henrik Enghoff as *Cylindroiulus apenninorum* and an account of its discovery was published in a local journal (Barber, 2016). Whilst the present report was in draft, a second location at West Hoe Gardens, Plymouth was recorded (October 2016).

**BACKGROUND & HISTORY**

*C. apenninorum* was described by Brölemann in 1897 from Italy as *Iulus apenninorum*, to distinguish it from *Iulus dicentrus* (Latzel, 1884) from Austria with which it had previously been confused. The latter is now considered as being in a different genus (Read, 1990) and is known as *Allajulus dicentrus*.

In his original description Brölemann describes *C. apenninorum* as being robust and having between around 49-53 body rings. The biggest females were 31-33mm in length and 3mm in diameter. As is usual in *Cylindroiulus*, the first pair of legs in mature males were transformed into crotchets and the cheek plate was expanded. He provided a figure of the gonopods (Fig. 1) and mentions that like *C. pyrenaicus* and *A. dicentrus* there are two ‘points’ projecting from the rear end of the animal, those of the telson and the ventral scale.



**FIGURE 1: Redrawing of inside view of gonopod of *C. apenninorum* from Brölemann, 1897**

A number of subspecies and varieties have been named at various times but the main reason for distinguishing different subspecies seems to have been on the basis of gonopodal characters, particularly the opisthomere. More recent studies of the gonopods of *Cylindroiulus* species have shown that they can be variable in shape (see for example *C. britannicus*, Blower 1985) and there can also be differences in body size too. It is therefore likely that today we would not distinguish between these various subspecies although specimens have not been studied.

## DESCRIPTION

In the context of currently known British species, *C. apenninorum* is a medium to large julid, a little smaller than *C. caeruleocinctus*, and is medium brown to dark in colour (Fig. 2). However, it is worth noting that some specimens from the Isle of Wight were paler and more mottled (Fig. 3); it is possible that individuals were freshly moulted, but Berg (pers. comm.) notes that he has not seen pale individuals in any Dutch population. It has a straight, pointed dorsal projection on the telson and a ventral scale that is also pointed and projecting (Fig. 4). This same feature is also seen in another British species, *Enantiulus armatus* which tends to be rather smaller in size and paler in colour; some features of these two species are listed in Table 1. As noted by Brölemann, the cheek plate in mature males of *C. apenninorum* is expanded (although it does not appear as pronounced as in most other species of *Cylindroiulus*) and the first pair of legs are crotchet shaped (Fig. 5).

Unlike *Enantiulus* (and in common with other *Cylindroiulus* species), *C. apenninorum* lacks setae on the body rings; these are often most easily seen on the apodous rings close to the telson. Fig. 6 illustrates the telson and apodous rings of *E. armatus*.

**TABLE 1. Comparison of some characteristics of *Cylindroiulus apenninorum* and *Enantiulus armatus*.**

	<i>C. apenninorum</i>	<i>E. armatus</i> (from Blower, 1985)
<b>Size, up to</b>	33mm x 3mm	15.1mm x 1.05mm
Colour	Medium to dark brown But note pale specimens	Light olive green due to gut pigments & light amber cuticle
<b>Body rings</b>	45 – 53	Up to 51
<b>Setae on body rings</b>	Absent	Present
<b>Male first legs</b>	Comma shaped	More angular and “elbow” shaped
<b>Current known occurrence in Britain</b>	Isle of Wight & Plymouth, Devon	South Devon & Cornwall

## LOCATION AND ASSOCIATED SPECIES

The Isle of Wight in general and Ventnor Botanic Gardens in particular are known for their warm climate where a good number of exotic plants from various parts of the World are grown out-of-doors and it is apparently almost frost-free. Two specimens of *Oxidus gracilis* (normally a hot house species in the UK) were found out of doors underneath some timber in the "compost area" amongst rubbish. The garden is described as being influenced by the nearby chalk downs and with the majority at pH 7.5 and small, isolated and seasonally waterlogged pockets between pH 6.5 and 7 (Chris Kidd, pers. comm.). The first Plymouth location was a long established park in an old limestone quarry area at the western end of Plymouth Hoe where the quarry sides are south/south westerly facing. Various exotic

plants such as *Cordyline* are planted there. Animals were subsequently also found in a garden on Plymouth Hoe itself (limestone). In all cases they were under leaf litter.

*Haplopodoiulus spathifer* was found in good numbers in the Ventnor Gardens. This species seems to be quite widely found in botanic gardens in the south of England so was not perhaps unexpected and there is a connection between the Gardens and Kew where this species has been long established. *C. apenninorum* was very common in certain parts of these gardens, for example the palm garden and the 'Australia' section and specimens were found in wet litter over dry soil. They were comparable in size and shape to typical julids and appear markedly larger and fatter than *Enantiulus armatus*. The mature individuals were quite dark but there were some very pale examples too.



FIGURE 2: Habitus of mature *Cylindroiulus apenninorum*, specimen from Isle of Wight

#### ACTIVITY PERIOD

Both records of *C. apenninorum* were made in the autumn. Berg (pers. comm.) notes that most Dutch records have been collected between November and January and in April.

#### DISTRIBUTION IN EUROPE & HABITAT

The species was described from Italy where it is relatively common. Many of the earlier descriptions record it from sweet chestnut woodland.

*C. apenninorum* was apparently recorded in The Netherlands (as *Julus dicentrus*) as early as 1889 (Jeekel, 2001). Dr Jeekel (loc. cit.) recalled finding it in substantial numbers in Haagse Bos, an old park in the centre of The Hague, possibly a remnant of the old coastal deciduous woodlands behind the sand dunes. He also expressed surprise that this species had not been found elsewhere in Western Europe since it was not rare in those sites where he found it. There are now known to be several populations in the Netherlands (Berg 2008) where it is considered an alien species. It is described by Berg (pers. comm.) as being found in more or less 'natural' conditions around the west of the country (many sites





**FIGURES 3-5: *Cylindroiulus apenninorum*, specimens from Isle of Wight**

3) Pale specimen; 4) Posterior end showing projecting telson and ventral scale; 5) Head and first few legs of mature male (crotchet shaped first pair arrowed)



FIGURE 6 Posterior view of *Enantiulus armatus* – note prominent setae

around Den Haag and Delft) as well as further east, just north of Utrecht (about 5 sites) on a sand ridge deposited by the last ice age. All sites are on sandy soil in rather open forests. The western inland sites are *Populus alba* forests on dunes, with a dense understorey of *Urtica dioica*, *Hedera helix*, *Rubus fruticosus*, sometimes with *Anthriscus sylvestris*, *Silene dioica*, *Glechoma hederacea* and *Galium aparine*. The more central sites are also quite open deciduous forest growing on a lateral moraine but with a dense understorey. Berg notes that the species appears to like rather rich sandy soil and is absent from clay soils, also that the forest sites are often isolated and rather dry but that the species appears to be able to withstand a certain amount of disturbance. In the Netherlands the species is often accompanied by *Polydesmus denticulatus*, *Julus scandinavicus* and *Allajulus nitidus*.

## CONCLUSIONS

*C. apenninorum* appears to have been introduced to the UK but the fact that it has been found at several sites in the Netherlands suggests that it may occur in other places in the UK too. The Dutch habitat information suggests that the most promising places to look for the species is in areas with scattered trees on sandy soils (or botanic gardens!) but the two known British locations seem to be on alkaline soil. Juvenile specimens with a similar appearance were found in South Wales several years ago (Greg Jones, pers. comm.) but it was not possible to confirm the identification of these.

Specimens are currently deposited in the authors' and the BMIG collections.

## ACKNOWLEDGEMENTS

Thanks to Chris Kidd and Colin Pope for allowing collections to be made. We would like to thank Henrik Enghoff for identifying the specimens, Paul Richards and Dave Fenwick ([www.aphotofauna.com](http://www.aphotofauna.com)) for the use of their photographs and Matty Berg for additional information about the Dutch populations.

## REFERENCES

- Barber, T. (2016) Centipedes and millipedes from Ventnor botanic Gardens including a species new to Britain. *Proc. Isle of Wight Nat. Hist. Archaeol. Soc.* **30**: 88-93.
- Berg, M. (2008) *Verspreidingsatlas Nederlandse landpissebedden, duizendpoten en miljoenpoten*. European Invertebrate Survey, Nederland Vrije Universiteit.
- Blower, J.G. (1985) *Millipedes*. Synopsis of the British Fauna (New Series). No. **35**. The Linnean Society. 242pp.
- Brölemann, Henry Wilfred (1897) Deux Iulides nouveaux de la région méditerranéenne. - *Bulletin de la Société entomologique de France* **64 (10)**: 157-163 (ISSN: 0037-928X).
- Jeekel, C.A.W. (2001) The Dutch millipede fauna compared with the British. *Bulletin of the British Myriapod and Isopod Group* **17**: 43-59.
- Read, H.J. (1990) The generic composition and relationships of the Cylandroiulini – a cladistics analysis (Diplopoda, Julida: Julidae). *Ent, scand.* **21**:97-112.

**A THIRD BRITISH SITE FOR *METATRICHONISCOIDES LEYDIGII* (WEBER, 1880) (ISOPODA, ONISCIDEA: TRICHONISCIDAE)**

Paul Richards

Dept. of Animal & Plant Sciences, University of Sheffield, Sheffield, S10 2TN.

Email: [paul.richards@sheffield.ac.uk](mailto:paul.richards@sheffield.ac.uk)

In April 2012 The British Myriapod & Isopod Group visited Wentworth Castle Gardens, Stainborough (Richards, 2015). A comprehensive list of species was acquired, making this one of the most diverse sites in South Yorkshire for centipedes (Chilopoda), millipedes (Diplopoda) and woodlice (Isopoda: Oniscidea). Locally scarce species at the site included the millipedes *Brachychaeteuma bradeae*, *Cylindroiulus vulnerarius* and *Choneiulus palmatus* and the woodlice *Armadillidium nasatum* and *Porcellio spinicornis*.

Due to a potential change of usage for the walled garden area, involving considerable potential disruption, the author and Jim Flanagan visited the site on 10<sup>th</sup> March 2016 to identify the key areas for the rarer species, in the event that preservation of these sites might be an option. Daws (1995) refers to the notion that some small woodlice are ‘brought nearer to the surface by frosts’, so as there had been a strong overnight frost, we were making a particular effort to seek out any *Trichoniscoides* woodlice that may have previously been overlooked in the nursery area of the walled garden.

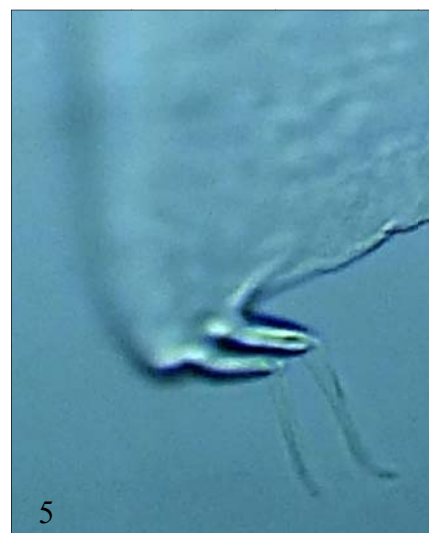
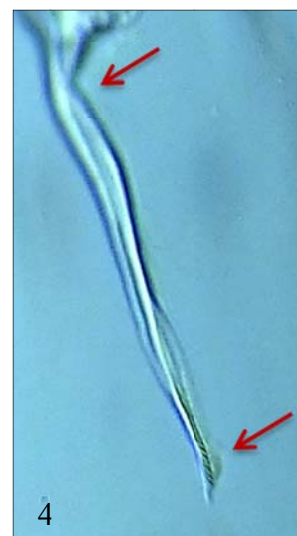


**FIGURE 1: *Metatrichoniscoides leydigii*, live male, Wentworth Castle Gardens**

A good proportion of the species previously recorded in 2012 were observed, with the addition of *Leptoiulus belgicus*, which was also formerly known from the site (Richards, 2010). In a final search on leaving the site, a large, embedded garden slab, located at NGR SE3194-0351-, was lifted in anticipation

of finding small Macrosternodesmid or Brachychaeteumid millipedes. However, the only thing beneath was a nest of lethargic, unidentified, black formicine ants. Within one of the nest galleries, a very small, white woodlouse was observed and extracted. It was assumed to be *Trichoniscus pygmaeus*, but on closer examination appeared to only have eyes on one side of the head. The specimen was taken alive and when photographed revealed that the ‘eye’ was a small piece of soil (Fig. 1). This close examination also showed the specimen to be male.

The animal barely moved when disturbed and was easily picked up on a section of its substrate. It was minute, around 2mm in length and white/unpigmented with shadows of the gut contents within. The body surface was rougher than the expected *Trichoniscus pygmaeus* and its antennae were short and robust. The series of tubercles on the head can produce shadows and structures, which could be construed as being eyes, but varied lighting angles under the microscope confirmed the absence of any ocelli. The small size, discontinuous body outline, form of the antennae and lack of eyes immediately identified the specimen as a *Metatrichoniscoides* species.



**FIGURES 2-5: *Metatrichoniscoides leydigii*, male, from Wentworth Castle Gardens**

2) Endopods of the second pleopod; 3) Endopod and exopod of first pleopod; 4) Distal article of first endopod showing basal ‘kink’ (arrowed) and bristles at tip (arrowed); 5) First exopod with two angled processes of equal length

Thankfully, being male, it was also possible to recognise the species as *M. leydigii*. Dissection clearly showed the robust and blunt ended nature of the endopod of the second pleopods (Fig. 2). Also the first pleopod's exopod was triangular with two angled processes of equal length (Figs. 3 & 5). Quite distinctive was the almost rectangular proximal/basal part of the first pleopod's endopod and the simple nature of the distal article which was basically a tubular process, with an angled 'kink' at its base (Figs. 3 & 4). Towards the tip, this process was also fringed with a row of fine bristles (Fig. 4), which are not illustrated in Oliver & Meechan (1993, fig.8c, p33.)

*Metatrichoniscoides leydigii* was originally first found in Britain in 1989 in a similar habitat in Oxford (Hopkin, 1990). The compost-rich gravel and rubble at the garden centre (Gregory, 2009) closely reflects the disturbed, plant nursery site within the Wentworth Castle walled garden. Adjacent to the specimen location were bags of compost, plant cloches, planted poly-tunnels and other evidence of horticulture, where materials have been imported to the site from numerous plant nursery locations. The more recent discovery of *M. leydigii* in a semi-natural, coastal site in Kent (Gregory, 2012) has opened the possibility that this species may be a post-glacial colonist, sharing its origins with the native populations in the near continent. However the habitat and location of the South Yorkshire site does not really reflect the Kent site characteristics and it is therefore considered that this specimen has been introduced along with garden materials.

Although this synanthropic association offers little in the way of conservation status for the site, the fact that the first site in Oxford has now been destroyed (Gregory, 2009) does mean that Wentworth Castle Gardens is significant in being only the second remaining in Britain for this species. The proposed future for this site does not sound conducive to the persistence of a population of *M. leydigii*, but its presence at the edge of the site may mean that it could survive. Unfortunately the tiny nature of this species does not make it easy to monitor, so determining whether it persists will be difficult. However, due to the disturbed and cultivated nature of this and the first British site for *Metatrichoniscoides leydigii*, there is every possibility that with some vigilance it could turn up in similar sites elsewhere in Britain.

## REFERENCES

- Daws, J. (1995) *Trichoniscoides* in Suffolk. *British Isopod Study Group Newsletter* No. **38**: 2 (unpublished).
- Gregory, S. (2009) *Woodlice and Waterlice (Isopoda: Oniscidea & Asellota) in Britain and Ireland*. Shrewsbury: FSC Publications.
- Gregory, S. (2012) The occurrence of two elusive woodlice, *Metatrichoniscoides leydigii* (Weber, 1880) and *Trichoniscoides sarsi* Patience 1908, in semi-natural habitat in Kent. *Bulletin of the British Myriapod & Isopod Group*. **26**: 37-40.
- Hopkin, S.P. (1990) *Metatrichoniscoides leydigii* (Weber, 1880). *British Isopod Study Group Newsletter*, No. **28**: 1-2 (unpublished).
- Oliver, P.G. & Meechan, C.J. (1993) *Woodlice*. Synopses of the British Fauna (New Series) No. **49**. Field Studies Council. Preston Montford.
- Richards, J.P. (2010) *Leptoiulus* in Yorkshire. *British Myriapod and Isopod Group Newsletter* No. **21**: 2-3 (unpublished).
- Richards, J.P. (2015) Report on BMIG field meeting at Stainborough, Barnsley, April 2012. *Bulletin of the British Myriapod & Isopod Group*. **28**: 65-72.

## NEW COUNTY RECORDS AND SOME HABITAT OBSERVATIONS FOR *TRICHONISCOIDES* SPECIES (ISOPODA, ONISCIDEA: TRICHONISCIDAE) FROM BEDFORDSHIRE AND DERBYSHIRE

Paul Richards

Dept. of Animal & Plant Sciences, University of Sheffield, Sheffield, S10 2TN

Email: [paul.richards@sheffield.ac.uk](mailto:paul.richards@sheffield.ac.uk)

### INTRODUCTION

Due to their very small size and need for male specimens to confirm species, valid records for woodlice of the genus *Trichoniscoides* are quite scarce (Gregory, 2009). In early 2016, a number of specimens were examined and identified as new county records.

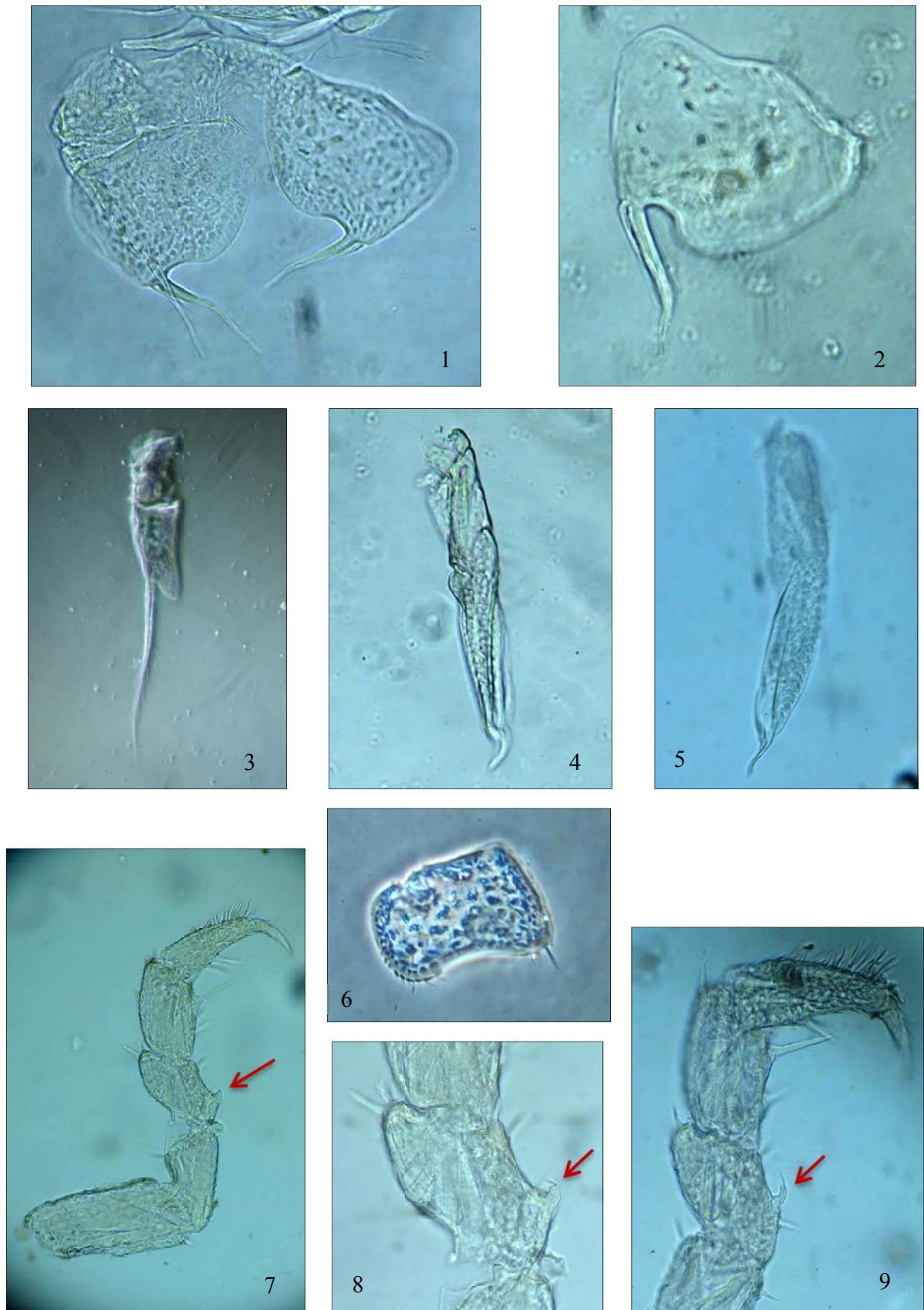
### BEDFORDSHIRE

Several specimens of the minute, *Trichoniscoides sarsi* Patience, 1908 were identified from samples taken for the F<sub>3</sub>UES project (Fragments, Functions, Flows & Urban Ecosystems: <http://bess-urban.group.shef.ac.uk/>) at the University of Sheffield. The work was undertaken as part of BESS (Biodiversity and Ecosystem Services Sustainability: <http://www.nerc-bess.net/>), a six-year (2011-2017) NERC research programme, designed to answer questions about the functional role of biodiversity in key ecosystem processes at the landscape scale. Over 80 sites across Bedford, Luton and Milton Keynes were extensively studied for soil, plants, invertebrates and multiple environmental factors. The sites represent a variety of permeable green spaces, including parkland, urban woods, road verges, industrial estates and private gardens. Over 550,000 invertebrates have been identified to varying levels of taxonomy, but the woodlice (Isopoda: Oniscidea) have been named to species.

Among the samples there were a few sites with tiny woodlice of the family Trichoniscidae, including *Haplophthalmus*, *Androniscus* and *Trichoniscus* species. There were also a number of tiny, colourless, female *Trichoniscoides*-like specimens. As the eyes lose all diagnostic colouration in alcohol and could not be seen at all in some specimens, identification between *Trichoniscoides* and *Metatrachoniscoides* species was only possible by close examination of male sexual characters (Hopkin, 1991).

Fortunately, at one site multiple individuals were extracted which proved to contain at least four adult male *Trichoniscoides* specimens. These are barely larger than 2mm in length and colourless in alcohol. In life they would have been off-white, suffused with pink-orange, with an eye of a single red ocellus (Fig. 10). The preserved specimens showed barely any sign of the ocelli. Dissection of the pleopods (Figs. 1–6) showed all the males to be *Trichoniscoides sarsi*, with the single hooked or ‘sickle-shaped’ tip to the second endopod and the two exopod processes of different lengths (Oliver & Meehan, 1993). These also clearly showed the characteristic hooked projection on the merus (middle segment) of the last pair of legs (7<sup>th</sup> pereopods, Figs. 7 – 9), which confirmed the species.

The specimens were collected with a vacuum sampler in an area adjacent to a pond within a domestic garden at The Buntings in sub-urban Bedford on 6<sup>th</sup> August 2013. This continues to support the theory that *Trichoniscoides sarsi* inhabits synanthropic, disturbed sites, such as established gardens and churchyards (Gregory, 2009). The almost identical relative, *Trichoniscoides helveticus* Carl is found in more semi-natural, calcium rich habitats, including grassland and woodland, in a similar part of the country. Both species are designated as ‘Nationally Scarce’ in the recent species status review (Lee, 2015) and this is the first record of *Trichoniscoides sarsi* for Bedfordshire.



**FIGURES 1-9: *Trichoniscoides sarsi*, male, from Bedford**

1) First exopods (& endopod); 2) First exopod; 3) First endopod; 4 & 5) Second endopod; 6) Second exopod; 7, 8 & 9) Seventh pereopod showing hooked process (arrowed) on merus.



Both species are generally only recognised by specialists who are experienced with finding tiny woodlice such as this, but are then usually only found in ones and twos. This record is unusual in that 23 individuals were collected in one sample, of which 4 were male. These species are also recognised as being more readily found during frosty weather (e.g. Daws, 1995), so a hot August day is an unusual time to encounter them. The vacuum extracts most things from an area of 1.2m<sup>2</sup> and only from open litter or the soil surface, so these specimens were not underneath slabs or stones, which would be a more typical habitat in which to find these species. This method of collection is not normally considered the most efficient for locating small, soil dwelling woodlice (Sanders & Entling, 2011), but on this occasion seems to have very effectively captured a good representative sample of these normally elusive creatures. A second sample site within the garden also provided an individual *Trichoniscoides*, but it was female and therefore not identifiable to species. Knowing that the species is not restricted to a single point in the garden, it would be interesting to inspect other adjacent sites, by more traditional hand searching methods, at a more suitable time of year to determine the extent of their distribution in the area.

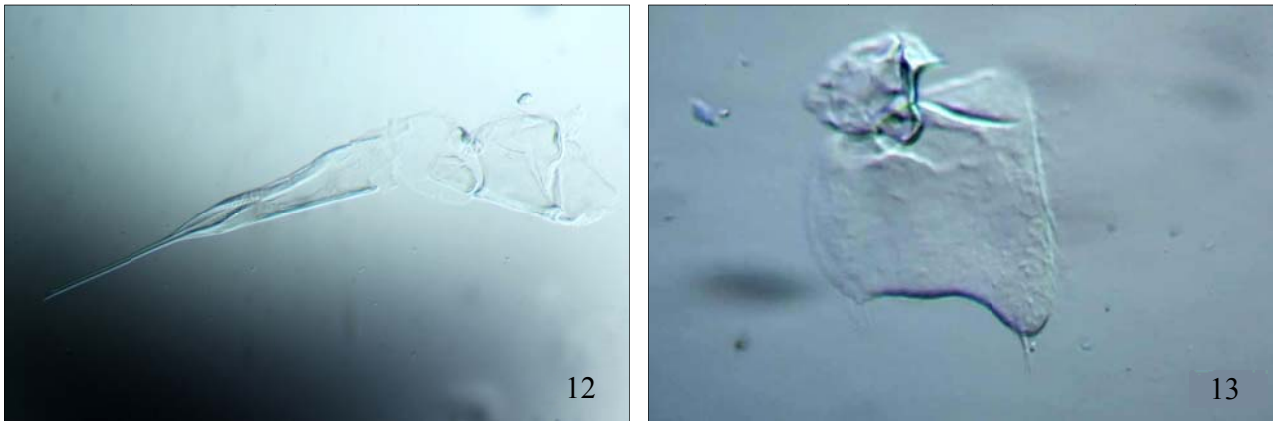
## DERBYSHIRE

Following the experience gained from identifying the Bedford specimens, further opportunity was taken to look for more of these tiny woodlice. Given the greater likelihood of finding winter specimens, some churchyard sites on limestone in the Derbyshire Peak District were investigated during February 2016. Alongside other under-recorded species, such as *Haplophthalmus mengii* and *Trichoniscus pygmaeus*, the millipede *Ophiodesmus albonanus* and the springtail *Monobella grassei*, four *Trichoniscoides* specimens were found under stones around the edge of the graveyard in Great Longstone (SK200719). These were all cream coloured and clearly infused with orange-pink, with eyes of a single red ocellus (Fig. 10). Three were female, but one male specimen was also present. Unfortunately, this specimen rapidly died and dried up in the collecting tube (Fig. 11), which made dissection and examination difficult.

The expectation at an inland synanthropic site, would be for *Trichoniscoides sarsi*, however the 7<sup>th</sup> pereopods did not show the hooked spine on the merus (as shown in Figs. 7-9). Also, the long tapering shape of endopod 2 (Fig. 12), was much more like that of *Trichoniscoides saeroeensis* Lohmander. Due to the dessication of the specimen, it was difficult to recognise Exopod 1, but Exopod 2 (Fig. 13) again looked like *T. saeroeensis*. Other slightly abnormal characters were present, which may have been a result of the condition of the specimen, so fresh individuals were sought.

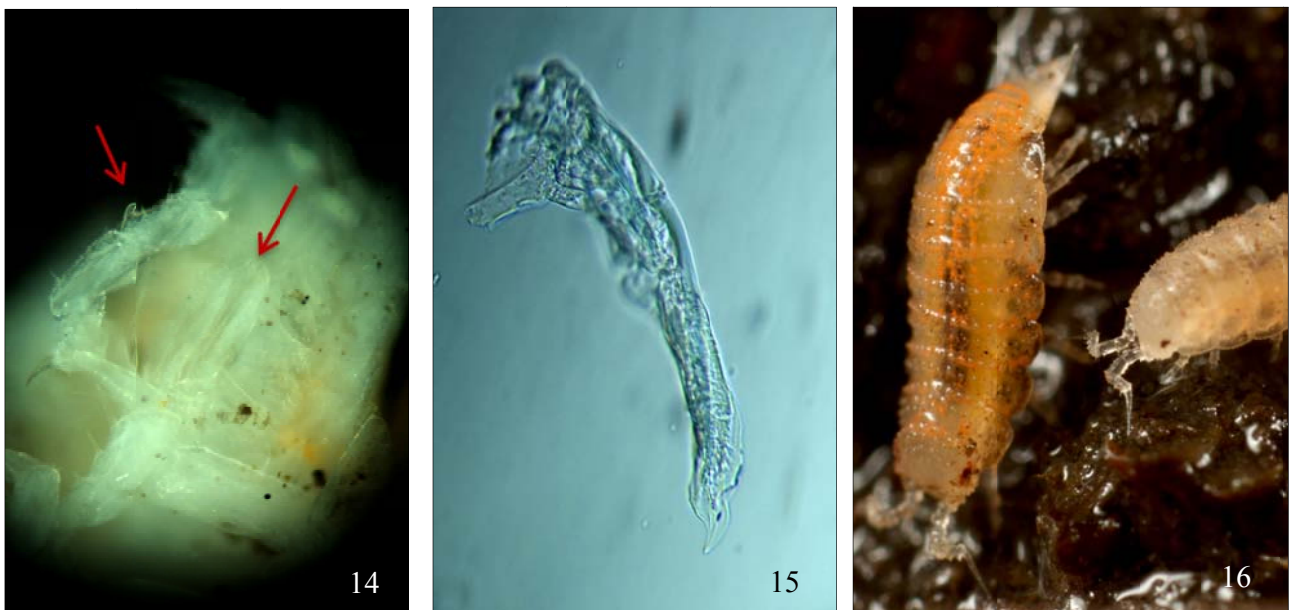


FIGURES 10-11: *Trichoniscoides* specimens from Derbyshire.  
10) *T. sarsi*, live female; 11) *Trichoniscoides* sp., dessicated male



FIGURES 12-13: *Trichoniscoides* sp., male, from Derbyshire.

12) Second endopod; 13) Second exopod



FIGURES 14-16: *Trichoniscoides sarsi*, from Derbyshire

14) Male specimen showing hooked process on merus of seventh pereopod (arrowed) and first & second endopods (arrowed); 15) Male second endopod; 16) Live *Trichoniscoides sarsi* (left) with *Trichoniscus pygmaeus* Sars.

A return to the site was rewarded with six further female/immature specimens and two males. The latter clearly displayed the hooked projection on the merus of the 7<sup>th</sup> pereopods and dissection showed typical *Trichoniscoides sarsi* pleopod characters. This was confirmation of a new county record for this species, but does not resolve the mystery of the abnormal characters shown by the previous male specimen. If *Trichoniscoides saeroeensis* is present, it would be a good distance from its recognised coastal distribution. Some records do occur up to 12km inland, or even on limestone uplands (Gregory, 2009: p61), but this would be the most land-locked record in Britain. The original report of *Trichoniscoides saeroeensis* in Britain (Sheppard 1968) was from limestone cave systems in Lancashire, which are also extensive in Derbyshire. There is a lot of potential to find more of these elusive woodlice within the limestone of the White Peak with its many limestone quarries, caves and churchyards to explore. If further work is undertaken during the winter months, we may be able to more clearly understand which species we are dealing with, their distribution and habitat requirements.

**ACKNOWLEDGEMENTS**

This work was partly supported by the F<sub>3</sub>UES Project as part of the Biodiversity and Ecosystem Service Sustainability (BESS) framework. Funded by the UK Natural Environment Research Council (NERC) and the Biotechnology and Biological Sciences Research Council (BBSRC), within the UK's Living with Environmental Change (LWEC) programme. (Grant Number NE/J015369/1)

**REFERENCES**

- Daws, J. (1995) *Trichoniscoides* in Suffolk. *British Isopod Study Group Newsletter* No. **38**: 2-3 (unpublished).
- Gregory, S.J. (2009) *Woodlice and Waterlice (Isopoda: Oniscidea & Asellota) in Britain and Ireland*, published for Biological Records Centre by Field Studies Council Publications.
- Hopkin, S.P. (1991) A key to the woodlice of Britain and Ireland. *AIDGAP Publication No 204*. Preston Montford, Field Studies Council Publications. (Reprinted from *Field Studies*, **7**: 599-650).
- Lee, P. (2015) *A review of the millipedes (Diplopoda), centipedes (Chilopoda) and woodlice (Isopoda) of Great Britain*. Natural England Commissioned Report NECR186. Species Status No. **23**. Natural England.
- Oliver, P.G. & Meechan, C.J. (1993) *Woodlice*. Synopses of the British Fauna (New Series) No. **49**. Linnean Society of London/Field Studies Council, Preston Montford.
- Sanders, D. & Entling, M.H. (2011) Large variation of suction sampling efficiency depending on arthropod groups, species traits, and habitat properties. *Entomologia experimentalis et applicata* **138**: 234–243. The Netherlands Entomological Society.
- Sheppard, E.M. (1968) *Trichoniscoides saeroeensis* Lohmander, an isopod new to the British fauna. *Transactions of the Cave Research Group of Great Britain*, **10**: 135-137.

**IDENTIFICATION OF NORTH EUROPEAN *MELOGONA* FEMALES, AND THE FIRST RECORD OF *M. GALLICA* (LATZEL, 1884) FROM DENMARK (DIPLOPODA, CHORDEUMATIDA, CHORDEUMATIDAE)**

Henrik Enghoff

Natural History Museum of Denmark, University of Copenhagen, Universitetsparken 15, DK-2100 København Ø.

Email: [henghoff@snm.ku.dk](mailto:henghoff@snm.ku.dk)

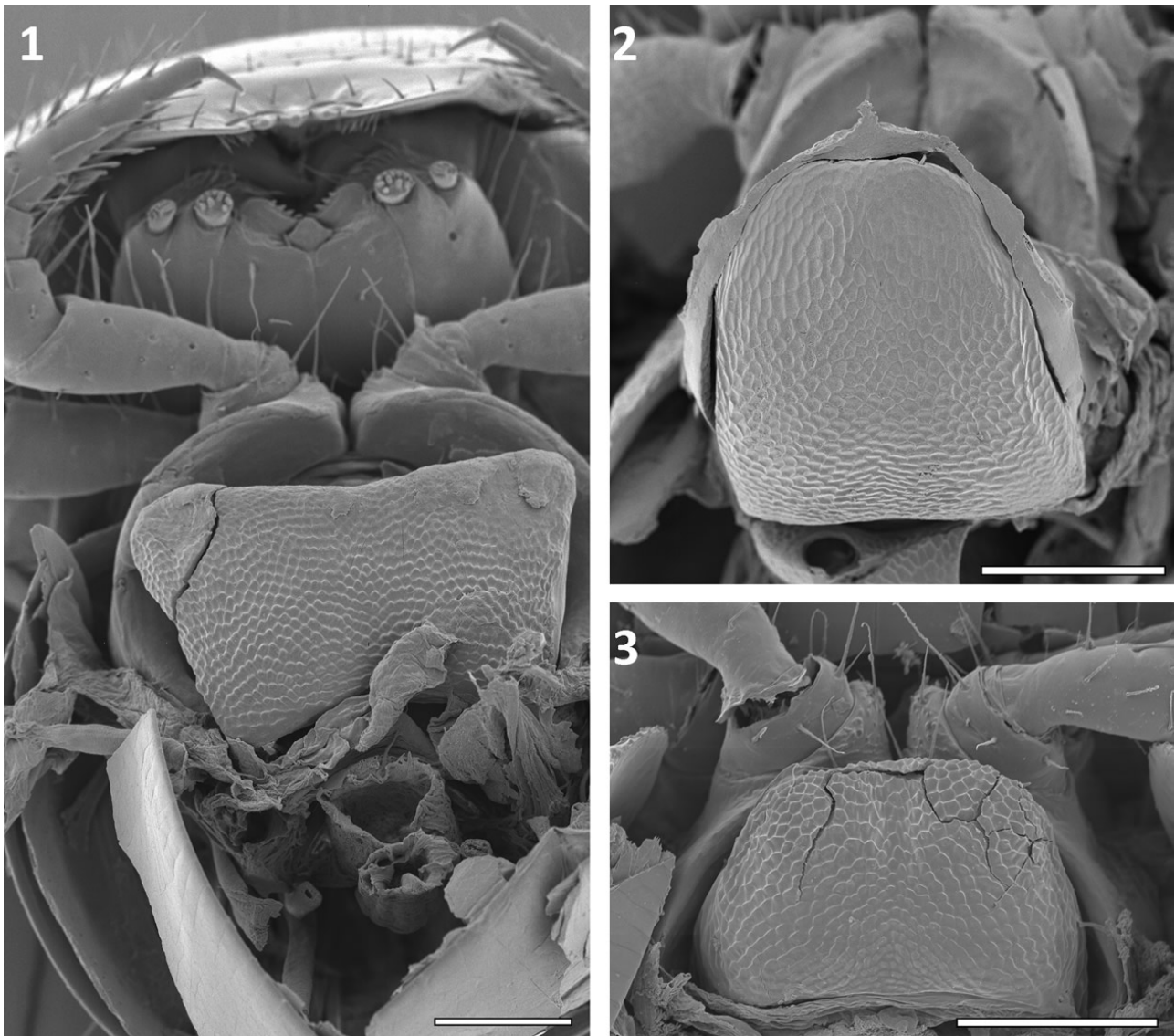
Three species of the genus *Melogona* Cook, 1895, have been found in northern Europe. *M. gallica* (Latzel, 1884), is known from Belgium, Switzerland, the Czech Republic, Germany, Denmark, France, UK, Ireland, Luxembourg, the Netherlands and Norway; *M. voigtii* (Verhoeff, 1899) from Austria, Belgium, Switzerland, the Czech Republic, Germany, Denmark, UK, the Netherlands, Poland and Sweden; *M. scutellaris* (Ribaut, 1913) from Belgium, Switzerland, France, UK, Ireland and Italy (Enghoff & Kime 2009). Whereas males of these species have distinctive gonopods (Brolemann 1935, Blower 1985, Andersson et al. 2005), and adults of both sexes of *M. scutellaris* may be recognized on the lower number of body ‘segments’ (28 vs. 30 in the two other species) females of *M. gallica* and *M. voigtii* have remained undistinguishable ([www.bmig.org.uk/species/melogona-voigtii](http://www.bmig.org.uk/species/melogona-voigtii), accessed 7 June, 2016).

The vulvae of *Melogona* species are remarkable in being fused in the midline. When viewed from a caudal point of view, the fused vulval bursae thus appear as one large sclerite. While checking some Danish *Melogona* females identified as *M. voigtii* I found that there were two distinct shapes of the bursal sclerite, and by comparison with British specimens of *M. gallica* it became clear that one of the morphotypes represent this species while the other represents *M. voigtii*.

In *M. gallica* (Fig. 1) the bursal sclerite is trapezoid, broader than long, with straight edges and broadest distally. In *M. voigtii* (Fig. 2) the sclerite is slightly longer than broad, broadest basally and with rounded lateral edges. In *M. scutellaris* (Fig. 3) the sclerite is also broadest basally and with rounded lateral edges, but in contrast to *M. voigtii* it is broader than long. The sclerite can easily be seen if the specimen is slightly ‘opened’ between the second and third pairs of legs.

Brolemann (1935: figs 698-699) illustrated the vulvae of *M. gallica* and (ibid.: figs 714-715) *M. scutellare*. Kurnik (1987: figs 12, 14, 15) gave drawings of vulvae of all three species and (ibid.: figs 37-38) scanning electron micrographs of vulvae of *M. voigtii*. Although most of these illustrations are somewhat difficult to interpret they are consistent with Figs 1-3.

*M. gallica* was found for the first time in Denmark in Fredensborg Slotspark, NE Zealand (55°59’N, 12°24’E), 10.iv.1984, Ole Martin leg. Four females were collected which I originally identified as *M. voigtii*, then the only known Danish species of the genus. Thirty-two years later (14.iv.2016), a male and two females of *M. gallica* were collected at the same site by Ruttapon Srisonchai and Henrik Enghoff. Both samples are kept in the Natural History Museum of Denmark. All Danish *Melogona* specimens in the museum were re-examined, but apart from the above mentioned sample, and a few unidentifiable juveniles, all are *M. voigtii*.



**FIGURES 1-3: *Melogona* spp. vulvae, oblique ventral view.**

1) *M. gallica*, showing also the head and the second pair of legs, specimen from England, Cheshire, Delamere Forest ca. 60 km SW of Manchester, 3.iv.1986, H. Enghoff leg.; 2) *M. voigtii*, specimen from Denmark, Århus, 7.xi.2015, L. Brøndum leg.; 3) *M. scutellaris*, specimen from England, Cheshire, Kerridge ca. 20 km SSE of Manchester, 4.iv.1986, H. Enghoff leg.

Scale bars = 0.1 mm. The fractures seen on the bursal sclerites in Figs. 1 and 3 are artificial.

## REFERENCES

- Andersson, G., Meidell, B.A., Scheller, U., Winqvist, J.-Å., Osterkamp Madsen, M., Djursvoll, P., Budd, G. & Gårdenfors, U. (2005) *Nationalnyckeln til Sveriges flora och fauna. Mångfotingar. Myriapoda*. ArtDatabanken, SLU, Uppsala.
- Blower, J.G. (1985) Millipedes. *Synopses of the British Fauna (New Series)* **35**: 1-242.
- Brolemann, H.W. (1935) Myriapodes Diplopodes (Chilognathes 1). *Faune de France* **29**: 1-369.
- Enghoff, H. & Kime, R.D. (2009) Fauna Europaea: Diplopoda. *Fauna Europaea version 2.0*, <http://www.faunaeur.org>, accessed 9 June 2016.
- Kurnik, I. (1987) Studien an Chordeumatida (Diplopoda): ♀-Genitalmorphologie und Verbreitung der Chordeumatidae Österreichs. *Zoologische Jahrbücher, Abteilung for Systematik* **114**: 269-288.

## CONFIRMATION OF THE PRESENCE OF *LAMYCTES AFRICANUS* (PORATH, 1871) IN FRANCE (CHILOPODA, LITHOBIOMORPHA: HENICOPIDAE)

Etienne Iorio

Groupe d'Etude des Invertébrés Armoriciens (GRETIA), 5 rue du Général Leclerc, F-44390 Nort-sur-Erdre.

E-mail: [e.iorio@gretia.org](mailto:e.iorio@gretia.org)

### ABSTRACT

After a review of specimens of the genus *Lamyctes* found in flowerpots from a garden in Arles (Bouches-du-Rhône department) during the year 2006, the species *Lamyctes africanus* (Porath, 1871) is confirmed in France. Its main determining characters are detailed and illustrated.

### RÉSUMÉ

Suite à un réexamen de spécimens du genre *Lamyctes* trouvés dans des pots de fleurs d'un jardin à Arles (Bouches-du-Rhône) en 2006, l'espèce *Lamyctes africanus* (Porath, 1871) est confirmée en France. Ses principaux caractères déterminants sont détaillés et illustrés.

### INTRODUCTION

Ten years ago, we collected some tens of Lithobiomorpha in a garden at Pont de Crau, a locality in the city of Arles (Bouches-du-Rhône department, France). Amongst these centipedes, twenty-three females coming from flowerpots had been identified as *Lamyctes emarginatus* (Newport, 1844) (Iorio & Berg, 2007). *L. emarginatus* is a species from the family Henicopidae, which is predominantly a southern hemisphere group. It is an invasive and pioneer species well distributed in France and elsewhere in Europe; it is frequently found in made-made habitats and parthenogenetic in France and almost in all Europe (Zapparoli, 2010; Iorio, 2014). In one of our notebooks dedicated to the provisional writing up of our inventories and identifications as well as of possible remarks and of morphological details, we had taken some notes on these *L. emarginatus* during our past examination. We had noticed that curiously, adult specimens had 25 to 29 antennal articles, mainly 28-29, instead of the usual number of 25 for this species. But we had not made researches on this subject, because of the inconstant number of articles as well as the fact that there were only two known French species in the genus *Lamyctes* (the other being the anophthalmous *L. coeculus* (Brölemann, 1889), easily distinguished and only known in greenhouses of the Muséum national d'Histoire naturelle of Paris).

Recently, but unfortunately after the completion of our catalogue of French centipedes (Iorio, 2014), we have read the paper of Enghoff *et al.* (2013), who have discovered *Lamyctes africanus* (Porath, 1871) in several localities from Denmark. These authors have also included a useful redescription and a key of European species of the genus concerned. Reading their description and key we remembered notes about the number of articles of our previously examined *Lamyctes* from Arles. We thus have re-examined all the specimens concerned and the aim of this article is to give some details of the results our examinations which allow us to confirm the presence of *L. africanus* in France.

### MATERIAL AND METHODS

Our personal collection of *Lamyctes* as well as of our other Chilopoda is preserved in 70% ethanol in our office in the city of Rougé (Loire-Atlantique department, France). We have examined all the specimens of the tube labelled *Lamyctes emarginatus* (Newport, 1844) – Arles (13), Pont-de-Crau,

jardin d'une maison, dans une pelouse et des pots de fleurs, environ 10 m d'altitude, 23.X.2006, réc./dét. E. Iorio, with a trinocular lens (7.5x to 50x), secondarily with a microscope (40x to 400x). The paper of Enghoff *et al.* (2013) has been used as the main basis for identification, but some other works have been consulted; e.g. Porath (1871), Attems (1928) and Iorio (2010). Measurements have been taken with 0.1 and 0.01 mm graduated scales. Magnified pictures have been made with a digital camera on the trinocular lens and stacking of several photographs with the *Combine ZP* software.

## RESULTS OF OUR REVISION

We have found that all adult females from Arles (= ten) unambiguously correspond to the hemicopid *Lamyctes africanus* as described by Enghoff *et al.* (2013) and also by Porath (1871) and Attems (1928); the thirteen other specimens, younger, being assigned to the same species using their criteria (even if some antennae are not fully developed). We note the writing of the author of *L. africanus*, originally described as *Henicops Africana* Porath, 1871 is correct with an "h" at the end, as is written on the original paper (Porath, 1871).

The main diagnostic criteria of the ten adult females of our material are detailed below:

**Habitus:** the colour of adult specimens is mainly bright orange with yellow to orange antennae and legs, with the bases of antennae darker up to their median and distal parts. They have black markings not only around the pale eyes but in several cases: the dark colour is present on the major part of the cephalic shield (Fig. 1). The colour of our specimens could have been degraded by ten years in 70% ethanol.

**Body-length:** the body-length reach 8 to 8.9 mm without antennae and legs. Our smaller specimens, which reach from less than 6 mm up to 7.1 mm, seem clearly to be immature; their gonopods seem to be not fully developed. This is particularly obvious on females of less than 7 mm, which have only 1+1 spurs on the basal article, or 2+2 with the internal clearly smaller; but it is much less obvious on both individuals of 7 and 7.1 mm. The antennae of immatures have up to 25-26 articles. Enghoff *et al.* (2013) have said that the body-size of females with fully developed gonopods is from 7 to 10 mm, but they have examined more specimens from various localities; thus their range is more complete than ours.

**Antennae:** on the ten pairs of antennae, i.e. twenty antennae in detail, we have counted eleven times 28 articles, four times 29 articles (Fig. 1), twice 27 articles, once 26 articles and once 25. One other antenna was incomplete.

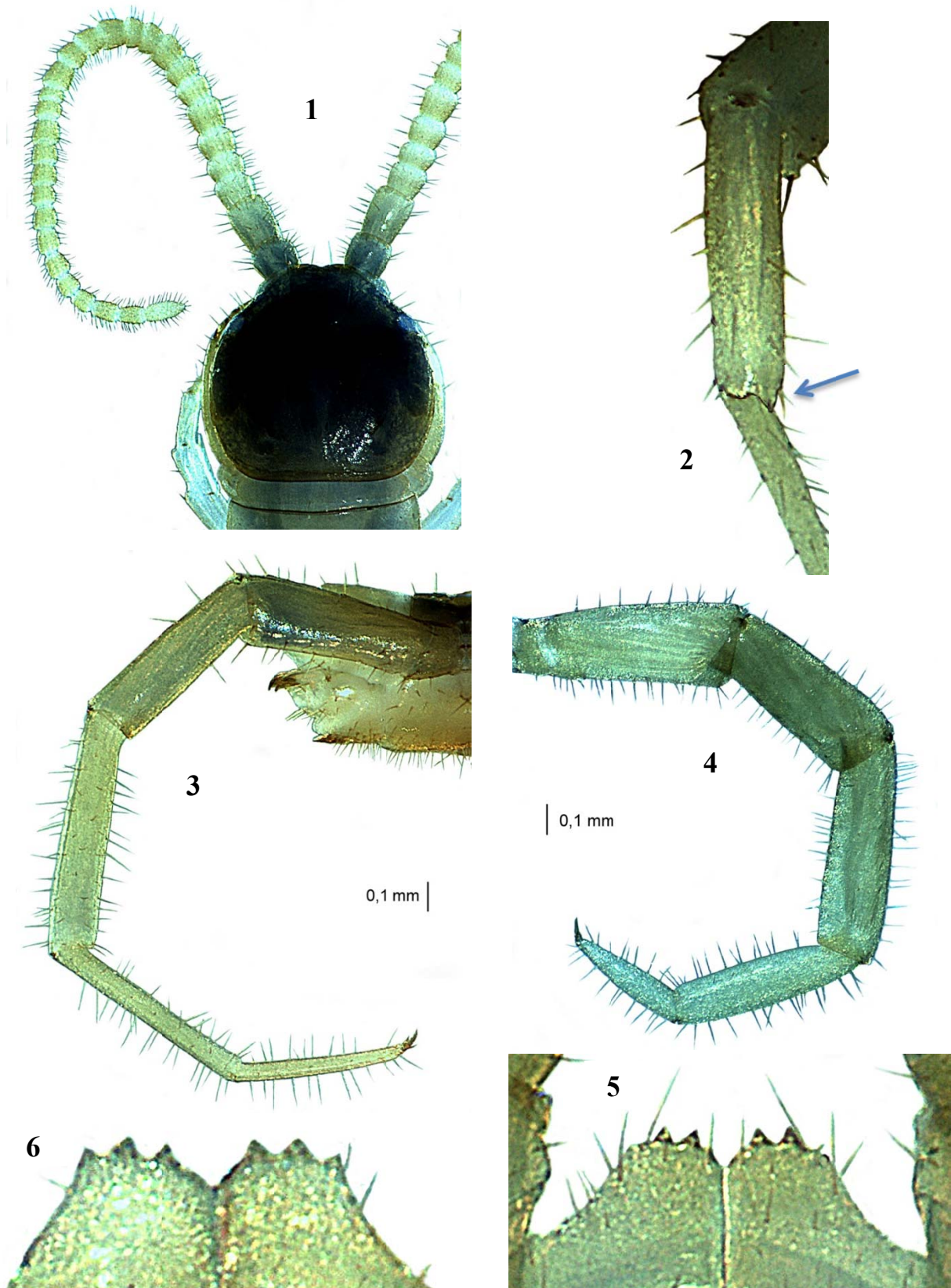
**Ocelli:** all females have one very large pale ocellus on each side of the head (Fig. 1).

**Forcipular teeth:** all females have 2 + 2 teeth on the distal edge of the coxosternum (Fig. 5). There is a small lateral shoulder on each side of the lateral teeth, but no third teeth unlike in *L. emarginatus* (Fig. 6).

**Legs of the 12<sup>th</sup> leg-bearing segment:** the triangular distal spinose projection is visible on the 12th tibiae of all adult females (Fig. 2 - arrowed), but it is more developed in some cases than in others.

**Legs of the 15<sup>th</sup> leg-bearing segment:** length of each of the three distal articles of the 15th legs in comparison with their own diameter. 15th tibiae: 0.78-0.82 mm/0.16 mm = 4.9x-5.1x; 15th tarsus 1: 0.72-0.75 mm/0.09 mm = 8x-8.3x; 15th tarsus 2: 0.53-0.56 mm/0.06 mm = 8.8x-9.3x. A 15th leg of a *L. africanus* from Arles is illustrated (Fig. 3) with also a 15th leg from a French *L. emarginatus* (Fig. 4).

**Accessory apical claws of 15th legs:** the accessory claws reach approximately almost the middle of the main claw.



**FIGURES 1-6: *Lamyetes africanus* and *L. emarginatus***

1) Head and left antenna of *L. africanus*; 2) 12th leg of *L. africanus*; 3) 15th right leg of *L. africanus*; 4) 15th left leg of *L. emarginatus*; 5) Forcipular teeth of *L. africanus*; 6) Forcipular teeth of *L. emarginatus*. Pictures taken by E. Iorio of *L. africanus* from Arles and of *L. emarginatus* from Le Louroux (Indre-et-Loire department, France)



## PRESENT KNOWN DISTRIBUTION

According to Enghoff *et al.* (2013), *Lamyctes africanus* was known in the past to be present in the following area outside Europe: South Africa, South-West Australia, Île Saint-Paul, Hawaii. Other records are quoted from outside Europe in the literature and some of these records are quite possibly correct according to Enghoff *et al.* (2013), but these authors consider that these records must be regarded as uncertain without revision.

In Europe, *L. africanus* has in the past been found in the following countries: Great Britain, in Edinburgh (greenhouses) (Barber, 1992), Denmark, various localities, always from more or less disused railway areas (Enghoff *et al.*, 2013), Olomouc in Czech Republic (Dányi & Tuf 2016), several localities in Germany (near rivers but also in other habitats as per example a meadow in a military field) (Decker *et al.*, in press) and Arles in France (garden, in flowerpots) (present study). In all these localities, *L. africanus* is considered as clearly introduced, probably brought with plants by trains or by vehicles.

In Arles, it is very probably well established at least in the studied garden because of the fairly numerous specimens of various stadia which we have found. It is thus the 150th addition to the French centipede checklist (146 species and 4 subspecies), after *Lithobius (Lithobius) brusteli* Iorio, 2015 and *L. (L.) derouetae* Demange, 1958 (Iorio, 2014, 2015, 2016).

## POSSIBLE OCCURRENCES IN FRANCE AND ELSEWHERE IN EUROPE

Enghoff *et al.* (2013) have also quoted a French case of a specimen identified as *Lamyctes emarginatus* which belongs probably to *L. africanus*. The specimen came from Annemasse (Haute-Savoie department) and has been found by Guillaume Jacquemin (<http://www.galerie-insecte.org/galerie/ref-66072.htm>) but this data has not been confirmed because it is only based on some pictures. We have asked Guillaume if he has kept the specimen, but unfortunately he did not. In fact, several other records quoted as *L. emarginatus* in the past by various European authors belong potentially to *L. africanus*, as errors underlined by Enghoff *et al.* (2013) and Decker *et al.* (in press) for themselves (Decker *et al.*, 2009; Enghoff *et al.*, 2011), as well as us for the case of our previous identification revised in this study. Thus, we think that it would be useful to revise various materials previously identified as *L. emarginatus* from Europe, particularly those coming from habitats similar to those quoted above, as well as to search for *L. africanus* in various European countries to find possible new locations.

## ACKNOWLEDGEMENTS

We are very grateful to Karin Voigtländer for the sending of her paper on *Lamyctes africanus* in press.

## BIBLIOGRAPHY

- Attems C. (1928) The Myriopoda of South Africa. *Annals of the South African Museum*, **26**: 1-431, pl. I-XXVI.
- Barber A.D. (1992) Distribution and habitat in British centipedes (Chilopoda). *Berichte des naturwissenschaftlich-medizinischen Vereins in Innsbruck*, Supplement **10**: 339-352.
- Dányi L. & Tuf I. H. (2016) Out of Africa: The first introduced African geophilomorph centipede record from a European greenhouse (Chilopoda: Geophilidae). *Zootaxa*, **4067** (5): 585–588.
- Decker P., Schmidt, C. & Hannig H. (2009) Die Hundertfüßer und Tausendfüßer (Myriapoda, Chilopoda, Diplopoda) des Truppenübungsplatzes Haltern-Borkenberge (Kreise Coesfeld und Recklinghausen). In: Hannig K, Olthoff M; Wittjen K & Zimmermann T (eds.) Die Tiere, Pflanzen und Pilze des Truppenübungsplatzes Borkenberge. *Abhandlungen aus dem Westfälischen Museum für Naturkunde*, **72** (2): 469-478.

- Decker P., Wesener T., Spelda J., Lindner E. N. & Voigtländer K. (in press) Barcoding reveals the first record of *Lamyctes africanus* (Porat, 1871) in Germany (Chilopoda: Lithobiomorpha). *Bonn Zoological Bulletin*, **65** (1).
- Enghoff H., Akkari N. & Pedersen J. (2013) Aliquid novi ex Africa? *Lamyctes africanus* (Porath, 1871) found in Europe (Chilopoda: Lithobiomorpha: Henicopidae). *Journal of Natural History*, **47**: 1-24.
- Enghoff H., Pedersen J., Thomsen P. F. & Iversen L. (2011) Tusindben, skolopendre og mejere fra Rødbyhavn og omegn – med fem nye arter for den danske fauna (Diplopoda, Chilopoda, Opiliones). *Entomologiske Meddelelser*, **79**: 3-12.
- Iorio E. (2010) Les Lithobies et genres voisins de France (Chilopoda, Lithobiomorpha). Révision de plusieurs espèces méconnues et nombreux apports inédits à la connaissance du genre *Lithobius* Leach, 1814. Avec une clé des familles, des genres et de toutes les espèces de l'ordre. *Supplément à la Revue de l'Association Roussillonnaise d'Entomologie*, **19**: 1-104
- Iorio E. (2014) Catalogue biogéographique et taxonomique des chilopodes (Chilopoda) de France métropolitaine. *Mémoires de la Société Linnéenne de Bordeaux*, **15**: 1-372.
- Iorio E. (2015) Description d'un nouveau lithobiomorphe cavernicole des Pyrénées-Orientales : *Lithobius (Lithobius) Brusteli* n. sp. (Chilopoda, Lithobiomorpha, Lithobiidae). *Bulletin de la Société Linnéenne de Bordeaux*, Tome 150 n. s., **43** (1): 81-92.
- Iorio E. (2016) Première observation en France de *Lithobius (Lithobius) derouetae* Demange, 1958 et autres données nouvelles sur les chilopodes du Sud-Ouest (Chilopoda). *Bulletin de la Société Linnéenne de Bordeaux*, Tome 151 n. s., **44** (1): 71-96.
- Iorio E. & Berg M. P. (2007) Première contribution à l'étude des chilopodes (Chilopoda) de Provence et description d'une nouvelle sous-espèce. *Bulletin de la Société linnéenne de Provence*, **58**: 21-36.
- Porath C. O. von (1871) Myriopoda Africae australis in Museo Regio Holmiensi asservata, recensuit. Pars I. Chilopoda. *Öfversigt af Kongliga Vetenskaps-Akademiens Förhandlingar* 1871, **28**: 1135-1116.
- Zapparoli M. (2010) *Lamyctes emarginatus* (Newport, 1844) (Chilopoda, Henicopidae). In: Roques A & Lees D (eds.) Introductory notes to factsheets - Chapter 14. *Biorisk*, **4** (2): 862-863.

---

**MISCELLANEA**

---

**MILLIPEDE DEFENCE FLUID**

**The following short item, and warning, was circulated by Thomas Wesener:**

Be careful with the ethanol mixed with the defence fluids of Spirostreptida. One species from Madagascar (collected alive) blackened my left thumb - it hurt and the skin is still strange 10 years later.

Another large-bodied genus from the Makay on Madagascar looks like *Aphistogoniulus* (beautifully red-black) - just breathing in the ethanol-defence fluid mix (specimens collected and stored in ethanol for >12 months!) made my eyes water and made me cough violently. I now always wear special nitrile gloves (at least on one hand) when handling Spirostreptida samples from Madagascar. However, these were two samples out of hundreds, if not thousands, I collected or came into contact with in collections!

Other unpleasant millipede encounters include:

- Callipodida, *Callipus* from Italy. They smell like urine and totally ruined my gloves. The smell never went off, and through my gardening gloves my fingers smelt for several days. Probably unpleasant but harmless.
- Spirostreptida, *Salpidobolus* from Indonesia. Some species also in the pet trade. Famous because the nitrile gloves disintegrate and form "bubbles" when in contact with the defence fluid of some species.
- Prof. Krauss once told me he coughed-up blood after handling numerous *Archispirostreptus*.

**At least they can't bite...**

---

**FIELD MEETING REPORTS**

---

**REPORT OF BMIG FIELD MEETING AT CLAONAIG, KINTYRE, AUTUMN 2010: WOODLICE AND MILLIPEDES, INCLUDING ADDITIONAL SCOTTISH RECORDS OF *CHORDEUMA SYLVESTRE* C.L.KOCH AND *LEPTOIULUS BELGICUS* (LATZEL)**

Steve J. Gregory

200 Ock Street, Abingdon, Oxfordshire, OX14 5DR, UK.

E-mail: [stevejgregory@btopenworld.com](mailto:stevejgregory@btopenworld.com)

**INTRODUCTION**

A small group of BMIG members spent a week, from 11th to 18th September 2010, at Coalfin House on the Claonaig Estate, Kintyre. The principle aim was to record centipedes (Chilopoda), millipedes (Diplopoda) and woodlice (Isopoda; Oniscidea) on the estate and adjacent areas. Much of the Claonaig Estate is moorland, pasture and conifer plantations but there are also coastal woodland including the Oak *Quercus* woodland of Claonaig SSSI. Surveys were also undertaken other areas off the estate, including Skipness village and Tarbert town on the coast, and at Brodick Castle on the island of Arran.

A report on the centipedes recorded was given by Barber (2011). This report covers the woodlice and millipedes. A list of sites visited is given in Table 1. Species recorded from each site are listed in Table 2 (woodlice) and Table 3 (millipedes).

**WOODLICE AND LANDHOPPERS**

Eleven species of woodlice (Oniscidea) were recorded (Table 2), of which *Oniscus asellus*, *Porcellio scaber* and *Trichoniscus pusillus* agg. were by far the most frequently encountered species. A good suite of Trichoniscid woodlice were recorded including several species that are under-recorded in Scotland: *Androniscus dentiger*, *Haplophthalmus mengii* seg., *Trichoniscus pygmaeus* and on the coast *Trichoniscoides saeroeensis*. Also of note is a single record of *Platyarthrus hoffmannseggii* from the gardens of Brodick Castle on Arran, the second record from western Scotland of this south-eastern woodlouse (Gregory, 2009).

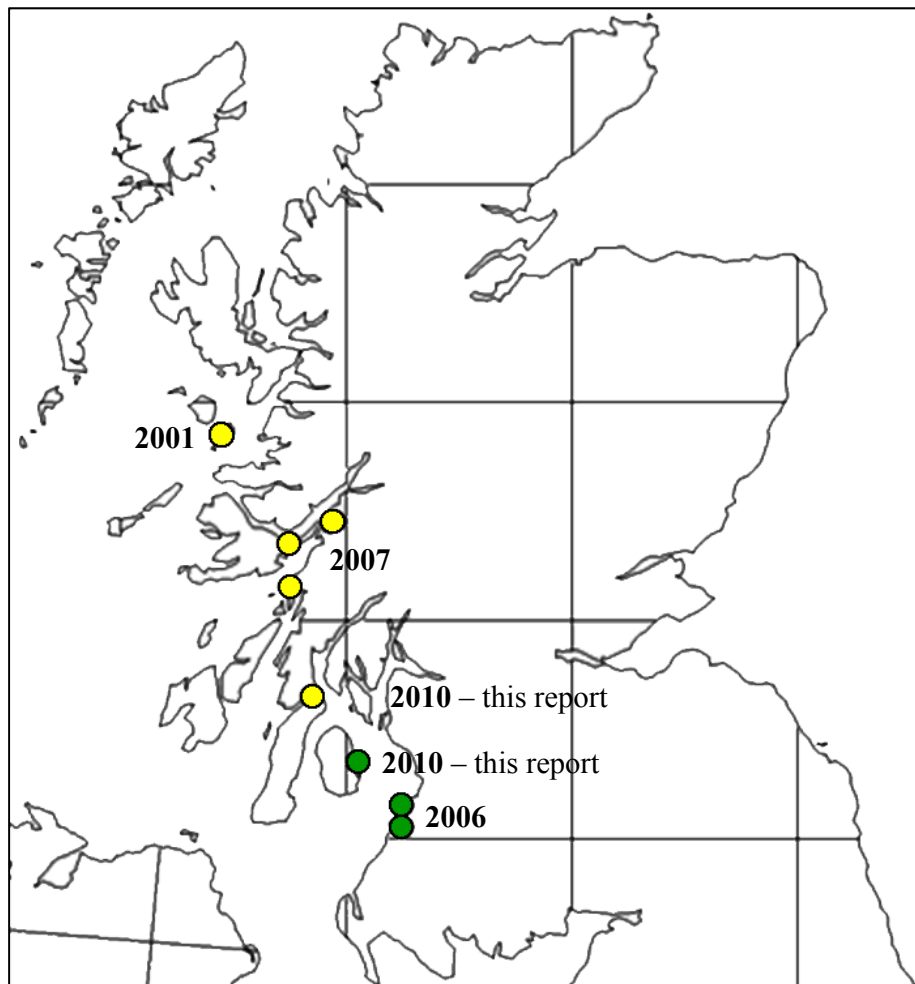
The Landhopper *Arcitalitrus dorrieni* (Amphipoda: Talitidae) was collected from the gardens of Brodick Castle on Arran. Although predominantly occurring in south west Britain, it has been known from the Scottish Islands of Colonsay since 1979 (Moore & Spicer, 1986) and subsequently from additional sites on the west coast of Scotland from Kintyre north to Inverewe, West Ross (Gregory, 2016, in this Bulletin). In Northern Ireland, on the opposite side of the Irish Sea, *A. dorrieni* has been widely recorded from ornamental gardens, such as those owned by The National Trust (Roy Anderson, pers. comm.) and it is probable that this will also prove to be the case in western Scotland.

**MILLIPEDES**

Nineteen species of millipede were recorded (Table 3). *Cylindroiulus punctatus* (28 sites) and *Tachypodoiulus niger* (23 sites) were the most frequently recorded, with *Cylindroiulus britannicus*, *Nanogona polydesmoides*, *Polydesmus angustus* and *Proteroiulus fuscus* also proving widespread. The record of *Glomeris marginata* from Brodick Castle on Arran is of note since this represents the northern limit of this species' range in Britain (Lee, 2006).

The overall highlight of the field meeting was finding the millipede *Chordeuma sylvestre* at Brodick Castle gardens on the Isle of Arran. Several specimens were collected from the gardens, including within a compost heap, and from inside glasshouses. In Britain this species was believed to be restricted to two sites in Cornwall (Lee, 2006) until its discovery at Culzean Castle gardens, Ayr in 2006 (Collis, 2007). Both Scottish sites (mapped in Fig. 1) are long-established ornamental gardens, where this millipede is likely to have been introduced. It may be worth searching for this species at other similar sites, but the situation is complicated by the presence of its congener *Chordeuma proximum* at other sites on the mainland (Barber & Gregory, 2008) and the Isle of Rum (Lee, 2006).

A close second, was the discovery of *Leptoiulus belgicus* at Talbert Harbour. Once thought to be restricted to south-west Britain, in 2001 it was reported from Scotland, on Eigg in the Inner Hebrides by Gordon Corbet (Lee, 2001). Five additional Scottish sites (within three 10km squares) were added during the BMIG 2007 field meeting in Oban (Barber & Gregory, 2008). The current Scottish distribution of *L. belgicus* is shown in Fig. 1. Its presence in the Western Isles is believed to be a natural extension of its strict Atlantic distribution (Lee, 2015) and it is likely to prove more widespread in western Scotland.



**FIGURE 1: Scottish records of *Chordeuma sylvestre* (●) and *Leptoiulus belgicus* (●)**  
Plotted at 10km resolution. 2001 - Gordon Corbet, Isle of Eigg; 2006 - BMIG Ayr field meeting (NB Culzean Castle lies within two 10km squares); 2007 - BMIG Oban field meeting; 2010 - BMIG Kintyre field meeting

**Table 1: List of sites visited. Site code follows Barber (2011)**

Collectors: ADB – Tony Barber; GMC – Glyn Collis; MDB – Mike Davidson; GH – Gordon Hunter; SJG – Steve Gregory

Site code	Locality	Detail	Grid Reference	VC	Date	Collectors
1a	Brodick Castle, Arran	Gardens	NS 01- 37-	100	13.ix.2010	ADB, SJG
1b	Brodick Castle, Arran	Outside glasshouses	NS 01- 37-	100	13.ix.2010	ADB
1c	Brodick Castle, Arran	Inside glasshouse	NS 01- 37-	100	13.ix.2010	ADB, SJG
2	Dunmore / Cnoc Eilid	By West Loch, Tarbert	NR 795 619 NR 795 620	101	14.ix.2010	ADB, SJG
3a	Tarbert Harbour	Waste ground, under stones, wood, etc.	NR 864 687	101	14.ix.2010	ADB, SJG
3b	Tarbert Kirk	Kirkyard	NR 863 686	101	14.ix.2010	SJG
4a	Skipness Woods, Kintyre		NR 897 573	101	11.ix.2010	ADB
4b	Skipness Woods, Kintyre		NR 902 579	101	17.ix.2010	MBD
5a	Claonaig Estate	Bridge beneath road	NR 898 577	101	15.ix.2010	SJG
5b	Skipness shore, Kintyre		NR 906 575	101	17.ix.2010	MBD
5c	Claonaig Estate	Beach east of ferry	NR 900 575	101	14.ix.2010	SJG
6	Skipness	Beside village hall - woodland	NR 897 573	101	11.ix.2010	ADB
7a	Skipness Castle, Kintyre		NR 908 577	101	17.ix.2010	MBD
7b	Kilbrannan Chapel, Skipness		NR 910 575	101	17.ix.2010	MBD
8	Claonaig Estate	Whitehouse Burn; grass, moor & conifers	NR 84- 60-	101	12.ix.2010	ADB, SJG
9a	Claonaig Shore	Kintyre	NR 886 565	101	12.ix.2010	MBD
9b	Skipness River (channel)	Kintyre	NR 895 588	101	12.ix.2010	MBD
10	Claonaig Estate	Allt a Chreamha (wet heath)	NR 888 584	101	14.ix.2010	MBD
11a	Claonaig Estate	Claonaig SSSI (Oak & Birch wood)	NR 859 554	101	14.ix.2010	ADB

Table 1: Sites visited (continued)

Site	Locality	Detail	Grid Ref.	VC	Date	Collectors
11b	Claonaig Estate	Claonaig SSSI (Oak wood)	NR 86- 55-	101	15.ix.2010	ADB, MBD
11c	Claonaig Estate	Claonaig SSSI (shingle beach)	NR 86- 55-	101	15.ix.2010	MBD, SJG
11d	Claonaig Estate	Coille Rubha Dhuibh	NR 86- 55-	101	15.ix.2010	SJG
12a	Claonaig Estate	Gortaneorn, derelict dwelling	NR 892 571	101	16.ix.2010	ADB, GMC, SJG
12b	Claonaig Estate	Old Chapel, stones grass	NR 871 566	101	15.ix.2010	ADB, SJG
13	Claonaig Estate	Gartavaitch, old sheep walk	NR 859 589	101	15.ix.2010	ADB, GH
14c	Claonaig Estate	Felled conifer plantation	NR 893 573	101	16.ix.2010	ADB
14d	Claonaig Estate	Farm buildings	NR 882 568	101	15.ix.2010	SJG
14e	Claonaig Estate	Auchameanach (woodland)	NR 881 565	101	13.ix.2010	GMC, MBD
16a	Skipness Kirk	Kirkyard	NR 903 578	101	16.ix.2010	SJG
16b	Sgier Bhuidhe	Pier House (east end of Skipness Road)	NR 921 597	101	16.ix.2010	SJG
17a	Claonaig Estate	Cnochan Tigh Searmaiche	NR 857 583	101	17.ix.2010	ADB, SJG
17b	Claonaig Estate	Birchwood & stones	NR 867 568	101	17.ix.2010	ADB
17c	Claonaig Estate	Sheepfold	NR 867 568	101	17.ix.2010	ADB
18	Claonaig Estate		NR 867 566	101	17.ix.2010	SJG
19a	Saddell Abbey, Kintyre		NR 784 320	101	16.ix.2010	MBD
19b	Carradale Harbour	Shingle	NR817386	101	16.ix.2010	MBD
19c	Brackley Burial Ground	Kintyre	NR793418	101	16.ix.2010	MBD
20a	Crarae Gardens	under stones, bark, among plant pots, etc	NR 98- 97-	98	18.ix.2010	ADB, MBD, SJG
20b	Crarae Gardens	Cool greenhouse	NR 98- 97-	98	18.ix.2010	ADB
20c	Crarae Cemetery		NR 986 972	98	18.ix.2010	SJG
21	Lochgoilhead	Coastal shingle and strandline	NN 199 013	98	18.ix.2010	SJG

Table 2: Woodlice and Landhoppers recorded during the BMIG Kintyre field meeting, September 2010

Species	Locality																
	1a	1c	2	3a	3b	4b	5a	5b	7a	7b	8	9a	9b	11a	11b	11c	11d
Amphipoda																	
<i>Arcitalitrus dorrieni</i>	X	X															
Isopoda																	
<i>Ligia oceanica</i>				X								X				X	
<i>Androniscus dentiger</i>	X	X			X			X	X								
<i>Haplophthalmus mengii seg.</i>					X		X			X							
<i>Trichoniscoides saeroeensis</i>													X			X	
<i>Trichoniscus pusillus agg.</i>	X		X		X			X			X	X			X	X	
<i>Trichoniscus pygmaeus</i>																	
<i>Oniscus asellus</i>			X	X	X	X		X	X	X	X		X	X	X	X	
<i>Philoscia muscorum</i>					X										X	X	X
<i>Platyarthrus hoffmannseggii</i>		X															
<i>Porcellio scaber</i>	X	X	X	X	X	X		X	X	X		X				X	
<i>Porcellio spinicornis</i>									X								



Table 2: Woodlice (continued)

Species	Locality														Total sites
	12a	13	14d	14e	16a	16b	17a	18	19a	19b	19c	20a	20c	21	
Amphipoda															
<i>Arcitalitrus dorrieni</i>															2
Isopoda															
<i>Ligia oceanica</i>						X				X				X	6
<i>Androniscus dentiger</i>					X					X		X		X	9
<i>Haplophthalmus mengii seg.</i>	X								X						5
<i>Trichoniscoides saeroeensis</i>														X	3
<i>Trichoniscus pusillus agg.</i>	X		X		X	X		X	X		X	X		X	17
<i>Trichoniscus pygmaeus</i>	X								X			X		X	4
<i>Oniscus asellus</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	26
<i>Philoscia muscorum</i>			X	X		X									7
<i>Platyarthrus hoffmannseggii</i>															1
<i>Porcellio scaber</i>	X		X	X	X	X	X	X		X	X	X	X	X	23
<i>Porcellio spinicornis</i>															1

Table 3: Millipedes recorded during the BMIG Kintyre field meeting, September 2010

MILLIPEDES	Locality																				
	1a	1b	1c	2	3a	3b	4a	4b	5a	5b	5c	6	7b	8	9a	9b	10	11a	11b	11c	11d
<i>Glomeris marginata</i>	X																				
<i>Chordeuma sylvestre</i>	X	X	X																		
<i>Melogona ?scutellaris</i>																					
<i>Nanogona polydesmoides</i>				X	X	X		X	X	X											
<i>Brachydesmus superus</i>																					
<i>Macrosternodesmus palicola</i>																					
<i>Polydesmus angustus</i>	X			X		X					X			X							X
<i>Polydesmus inconstans</i>																					
<i>Baniulus guttulatus</i>	X				X					X			X								
<i>Boreoiulus tenuis</i>																					
<i>Proteroiulus fuscus</i>	X			X				X	X					X		X					X
<i>Cylindroiulus britannicus</i>	X	X	X	X					X												X
<i>Cylindroiulus latestriatus</i>				X			X			X											X
<i>Cylindroiulus punctatus</i>	X	X		X	X	X		X	X					X	X	X		X	X	X	
<i>Julus scandinavus</i>																					
<i>Leptoiulus belgicus</i>					X																
<i>Ommatoiulus sabulosus</i>								X				X							X		X
<i>Ophiulus pilosus</i>	X			X															X		
<i>Tachypodoiulus niger</i>	X	X	X	X	X	X		X						X	X		X		X		X

Table 3: Millipedes (continued)

MILLIPEDES (cont.)	Locality																		Total sites	
	12a	12b	13	14c	14d	14e	16a	16b	17a	17b	17c	18	19a	19b	19c	20a	20b	20c		21
<i>Glomeris marginata</i>																				1
<i>Chordeuma sylvestre</i>																				3
<i>Melogona ?scutellaris</i>																X	X	X		3
<i>Nanogona polydesmoides</i>					X	X	X									X				10
<i>Brachydesmus superus</i>																		X		1
<i>Macrosternodesmus palicola</i>													X							1
<i>Polydesmus angustus</i>	X	X										X				X				10
<i>Polydesmus inconstans</i>									X											1
<i>Blaniulus guttulatus</i>															X	X		X		8
<i>Boreoiulus tenuis</i>							X													1
<i>Proteroiulus fuscus</i>							X	X								X				10
<i>Cylindroiulus britannicus</i>		X	X		X		X	X								X				12
<i>Cylindroiulus latestriatus</i>																			X	5
<i>Cylindroiulus punctatus</i>		X		X	X	X	X	X	X	X	X	X	X		X	X		X	X	28
<i>Julus scandinavus</i>																	X	X		2
<i>Leptoiulus belgicus</i>																				1
<i>Ommatoiulus sabulosus</i>																X				5
<i>Ophiulus pilosus</i>							X								X	X			X	7
<i>Tachypodoiulus niger</i>		X	X			X	X	X				X	X	X		X		X	X	23

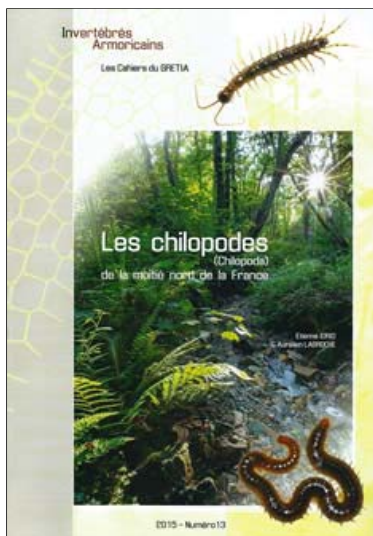
## ACKNOWLEDGEMENTS

The organisation and catering for this field meeting was undertaken by Dawn and Glyn Collis.

## REFERENCES

- Barber, A.D. (2011) Report of the BMIG field meeting at Claonaig, Kintyre, September 2010: Centipedes. *Bulletin of the British Myriapod & Isopod Group*. **25**: 66-68.
- Barber, A.D. (2004) Myriapoda from Wester Ross and Skye. *Bulletin of the British Myriapod & Isopod Group*. **20**: 25-33.
- Barber, A.D. & Gregory, S.J. (2008) Report on the Autumn Meeting in the Oban area, 2007: Diplopoda. *Bulletin of the British Myriapod & Isopod Group*. **23**: 47-49.
- Collis, G.M. (2008) Report on the Autumn Meeting in the Oban area, 2007: Isopoda. *Bulletin of the British Myriapod & Isopod Group*. **23**: 43-44.
- Collis, G.M. (2007) Report on the 2006 BMIG meeting in Ayrshire. *Bulletin of the British Myriapod & Isopod Group*. **22**: 32-35.
- Gregory, S.J. (2016) On the terrestrial landhopper *Arcitalitrus dorrieni* Hunt (Amphipoda: Talitridae): identification and current distribution. *Bulletin of the British Myriapod & Isopod Group*. **29**: 2-13.
- Gregory, S. (2009) *Woodlice and Waterlice (Isopoda: Oniscidea & Asellota) in Britain and Ireland*. Shrewsbury: Field Studies Council Publications.
- Lee, P. (2015) *A review of the millipedes (Diplopoda), centipedes (Chilopoda) and woodlice (Isopoda) of Great Britain*. Species Status No. **23**. Natural England Commissioned Reports, Number 186.
- Lee, P. (2006) *Atlas of the millipedes (Diplopoda) of Britain and Ireland*. Sofia & Moscow: Pensoft.
- Lee, P. (2001) Millipede Recording Scheme news. *British Myriapod & Isopod Group Newsletter* No. **3**: 2 (unpublished).

## BOOK REVIEWS



## LES CHILOPODES (CHILOPODA) DE LA MOITIÉ NORD DE FRANCE

Etienne Iorio & Aurélien Labroche

*Invertébrés Armoricaains, Les Cahiers de GRECIA, 2015: 13:1-108, (ISSN 1958-1793) €18*

This account covers the centipedes of the northern part of France and is therefore of particular interest to British and Irish workers and to colleagues in Belgium, The Netherlands and Germany west of the Rhine. The region covered includes Alsace, Lorraine, Franche-Comté, Champagne-Ardenne, Bourgogne, Nord-Pas-de-Calais, Picardie, Normandie, Bretagne, Pays de la Loire and Ile-de-France and includes 65 taxa plus three very doubtfully occurring ones. As such it excludes

species only known from southern France, Alps, Pyrenees, the Mediterranean coastal area and Corsica.

After a brief introduction, the main bibliographical resources for a study of the French fauna are listed along with notes on hand collecting techniques and the making of a collection. This is followed by a list of species, their presence or possible occurrence and an estimate of their frequency of being found from CC (très commun), PC (peu commun), R (rare) to RR (très rare). Amongst types that might occur are included three species of *Eupolybothrus*, *Lithobius latro*, *L. lucifugus* and *Schendyla dentata*. Of species whose presence in the northern part of France is very doubtful we have *Lithobius erythrocephalus*, *Dignathodon microcephalus* and *Henia brevis*. The presence of *S. dentata* and *H. brevis* as only either potential or doubtful might surprise British workers. A map showing the numbers of species recorded from various départements indicates more than 20 across all the Norman and Breton ones, no doubt, in part at least, due to the activity of Etienne Iorio himself in Armorica with 33 in Finistère but with the richest fauna, not unexpectedly in southern France (69 in Alpes-Maritimes).

A key to the four orders of centipedes is followed by keys to the individual species. What is notable about these keys is not only the presence of an English as well as a French version (most welcome to those whose school-learnt French is not fluent) but the presence throughout the keys of macrophotographs of the various features used in them. Go to page 73 and you can see a colour photograph showing that extra spine on the 15<sup>th</sup> leg between VpP and DpP in *Lithobius borealis* or VmH (VmC) and VaH (VaC) in *L. pilicornis* on page 33! This seems to be a major leap forward in illustrating a centipede key for ease of use (as compared with using only drawings) and the authors should certainly be congratulated on this innovation which sets a standard for the future.

For those “allergic to keys” and those just beginning work on centipedes, there follows a number of illustrations of certain species based on a maximum of three simple characters. Such include *Lithobius forficatus*, *L. variegatus*, *Cryptops anomalans* (based on size), *Geophilus ribauti*, *Henia vesuviana*, *Himantarium gabrielis*, *Mecistocephalus guildingii*, *Stigmatogaster subterranea*, *Strigamia crassipes* and *S. acuminata*. Would a similar exercise be worth doing for British & Irish species?

Tony Barber

# BULLETIN OF THE BRITISH MYRIAPOD & ISOPOD GROUP: VOLUME 29 (2016)

## CONTENTS

---

<b>Editorial</b>	1
<b>Articles</b>	
On the terrestrial landhopper <i>Arcitalitrus dorrieni</i> (Hunt, 1925) (Amphipoda: Talitridae): Identification and current distribution – Steve J. Gregory	2
Early county lists of non-marine Isopoda and Myriapoda from Cambridgeshire compiled by the Rev. Leonard Jenyns – Paul T. Harding and A. D. Barber	14
Is <i>Porcellio laevis</i> (Latreille) declining in Britain and Ireland? – Paul T. Harding	23
<i>Cylindroiulus apenninorum</i> (Brölemann, 1897) (Diplopoda, Julida: Julidae) new for the UK from the Isle of Wight and South Devon – A. D. Barber & Helen J. Read	28
A third British site for <i>Metatrachoniscoides leydigii</i> (Weber, 1880) – Paul Richards	34
New records and habitat observations for <i>Trichoniscoides</i> species (Isopoda, Oniscidea: Trichoniscidae) from Bedfordshire and Derbyshire – Paul Richards	37
Identification of North European <i>Melogona</i> females, and the first record of <i>M. gallica</i> (Latzel, 1884) from Denmark (Diplopoda, Chordeumatida: Chordeumatidae) – Henrik Enghoff	42
Confirmation of the presence of <i>Lamyctes africanus</i> (Porath, 1871) in France (Chilopoda, Lithobiomorpha: Henicopidae) – Etienne Iorio	44
<b>Miscellanea</b>	
Defence fluids of millipedes – a warning	49
<b>Field meeting reports</b>	
Report of BMIG field meeting at Claonaig, Kintyre, September 2010: Woodlice and Millipedes, including additional Scottish records of <i>Chordeuma sylvestre</i> C.L. Koch and <i>Leptoiulus belgicus</i> Latzel – Steve J. Gregory	50
<b>Book reviews</b>	
Les chilopodes (Chilopoda) de la moitié nord de France (by Etienne Iorio & Aurélien Labroche) – A.D. Barber	59

Cover illustration: *Arcitalitrus dorrieni* (Hunt), habitus.

Cover photograph: *Porcellio laevis* (Latreille), male © Jim Flanagan

**Editors:** H.J. Read, A.D. Barber & S.J. Gregory

c/o Helen J. Read; email [helen@helen-read.co.uk](mailto:helen@helen-read.co.uk)

© Published by the British Myriapod and Isopod Group 2014

ISSN 1475 1739