ISSN 1475 1739

Bulletin of the BRITISH MYRIAPOD and ISOPOD GROUP

Volume 28 (2015)

CONTENTS

Cover illustration: *Ceratosphys amoena* Ribaut, 1920, male left telopodite, lateral external view. A millipede new to Britain.

Cover photograph: *Hylebainosoma nontronensis* Mauriès & Kime, 1999 © Christian Owen. A second millipede new to Britain.

Editors: H. J. Read, A. D. Barber & S. J. Gregory
c/o Helen J. Read, 2 Egypt Wood Cottages, Egypt Lane, Farnham Common, Bucks, SL2 3LE, UK.

ISSN 1475 1739

EDITORIAL

The species list for the British Isles continues to rise for woodlice and especially millipedes, both via those that are clearly introduced (discovered in hothouses and home furnishing shops) and those that occur outside where their origins are less clear. This Bulletin includes a remarkable number of such reports. Increasing concerns over tree diseases has lead to some commercial importation restrictions and regulations. The horticultural industry is much more aware of how easy it is to bring in soil organisms with plants as they are transported around the globe but it is still very easy for individuals to bring in plants from other countries. Certainly it doesn't appear that the flow of new species in Britain is stopping just yet.

This year the BMIG revised various aspects of the constitution and Committee to try and bring in some new faces and skills. Now that the website has 'bedded in' it is easier to keep people up to date electronically and this has enabled the Bulletin to move to electronic publishing, a significant change which we hope will mean that more people are able to access it. We know that people are starting to download the newsletter more via the website so the progression to make the most of electronic media makes perfect sense. The move to a more modern outlook has also continued with the development of a BMIG Facebook page which, together with a new Committee post to help us develop our on-line profile, will hopefully be just the start of a thriving virtual community.

Publicising our groups has not just been confined to the use of modern methods. We had a stand at the Natural History Museum 'Big Nature Day' with an array of live species on display most of which could be easily found by members of public in their gardens. The ease with which people come across woodlice, in particular, leads to interesting conversations about regional names for them, something reported on in more detail in this Bulletin. We would like to attend more exhibitions and events but one of the new Committee posts not filled was that of events organiser. Another aspiration is for a projects officer to promote ecological studies and explore the finer details of the distribution of some British species.

GEOPHILOMORPH CENTIPEDES (CHILOPODA: GEOPHILOMORHA) FROM NORTH-WEST SPAIN AND NORTHERN PORTUGAL COLLECTED BY THE BRITISH MYRIAPOD AND ISOPOD GROUP IN 2004

Steve J. Gregory[1] and John G. E. Lewis[2]

[1] 200 Ock Street, Abingdon, Oxfordshire, England, OX14 5DR, UK.
E-mail: stevejgregory@btopenworld.com

[2] Manor Mill Farm, Halse, Taunton, Somerset, TA4 3AQ, UK.
E-mail: johngelewis@realemail.co.uk

ABSTRACT

The British Myriapod and Isopod Group 2004 field trip to southern Galicia and northern Portugal resulted in the collection of a number of geophilomorph centipedes (Chilopoda: Geophilomorpha). Samples were collected from a variety of locations from low-lying coastal areas to inland habitats up to 800m asl. Although 11 distinct geophilomorph taxa are recognised, the samples were dominated by four species, *Geophilus easoni*, *G. truncorum*, *Henia vesuviana* and *Strigamia crassipes*. Most of the species recorded occur widely across Western Europe and will be familiar to British workers. The discovery of *Arenophilus peregrinus* has implications on the conservation status of this rare species in Britain. One species of *Geophilus* remains undetermined and may be a new species. An outline description is given. The results have filled some gaps in the previous faunistic knowledge of north-west Iberia and have helped to put our own British and Irish fauna into a broader European perspective.

INTRODUCTION

In 2004 the British Myriapod and Isopod Group, under the auspices of the European Invertebrate Survey, undertook a short expedition to north-western Spain (Galicia) and northern Portugal. This region was targeted because it lies at the southern end of the Atlantic zone, is relatively under recorded for centipedes (Chilopoda), millipedes (Diplopoda) and woodlice (Isopoda: Oniscidea) and is likely to support a potentially interesting fauna. A better understanding of the fauna here will help put our own British fauna (at the northern end of the Atlantic zone) into a broader European context.

Some interesting results from this 2004 field meeting have been reported previously for millipedes (e.g. Mauriès, 2005; Read, 2007) and woodlice (Gregory, Lee, Read, & Richards, 2012). This article reports on the species of geophilomorph centipede (Chilopoda: Geophilomorpha) that were recorded during this field meeting.

MATERIALS AND METHODS

The group was based near La Guardia close to where the Rio Miño enters the Atlantic Ocean. Between 24th March and 29th March 2004 excursions were made into the southern Galician provinces of Pontevedra and Orense and into the northern Portuguese distrito of Viana do Castelo. A map indicating the position of the localities is given in Fig. 1. The list localities sampled is given in Table 1, with habitat details and grid references.

The main taxa targeted by surveys were millipedes (Diplopoda), centipedes (Chilopoda) and woodlice (Isopoda: Oniscidea). Surveys were mainly undertaken in semi-natural habitats, including deciduous woodland, upland moorland and coastal sand-dunes and beaches. A few synanthropic habitats, including gardens, were also sampled. At most sites specimens were collected by hand searching as many micro-sites as practical at each site. This included searching the underside of large stones and fallen timber, the superficial soil layer beneath, among leaf-litter, under bark and within fallen and standing dead wood. At a few sites leaf litter was sieved.

Specimens were collected by Steve Gregory (SJG), John Lewis (JGEL), Desmond Kime (RDK), Paul Lee (PL), Helen Read (HJR) and Paul Richards (JPR). Species determinations were made by John Lewis (including material collected by RDK, PL and HJR) and Steve Gregory (including material collected by JPR). All specimens are stored in 75% ethanol and are currently retained within the personal collections of the authors.

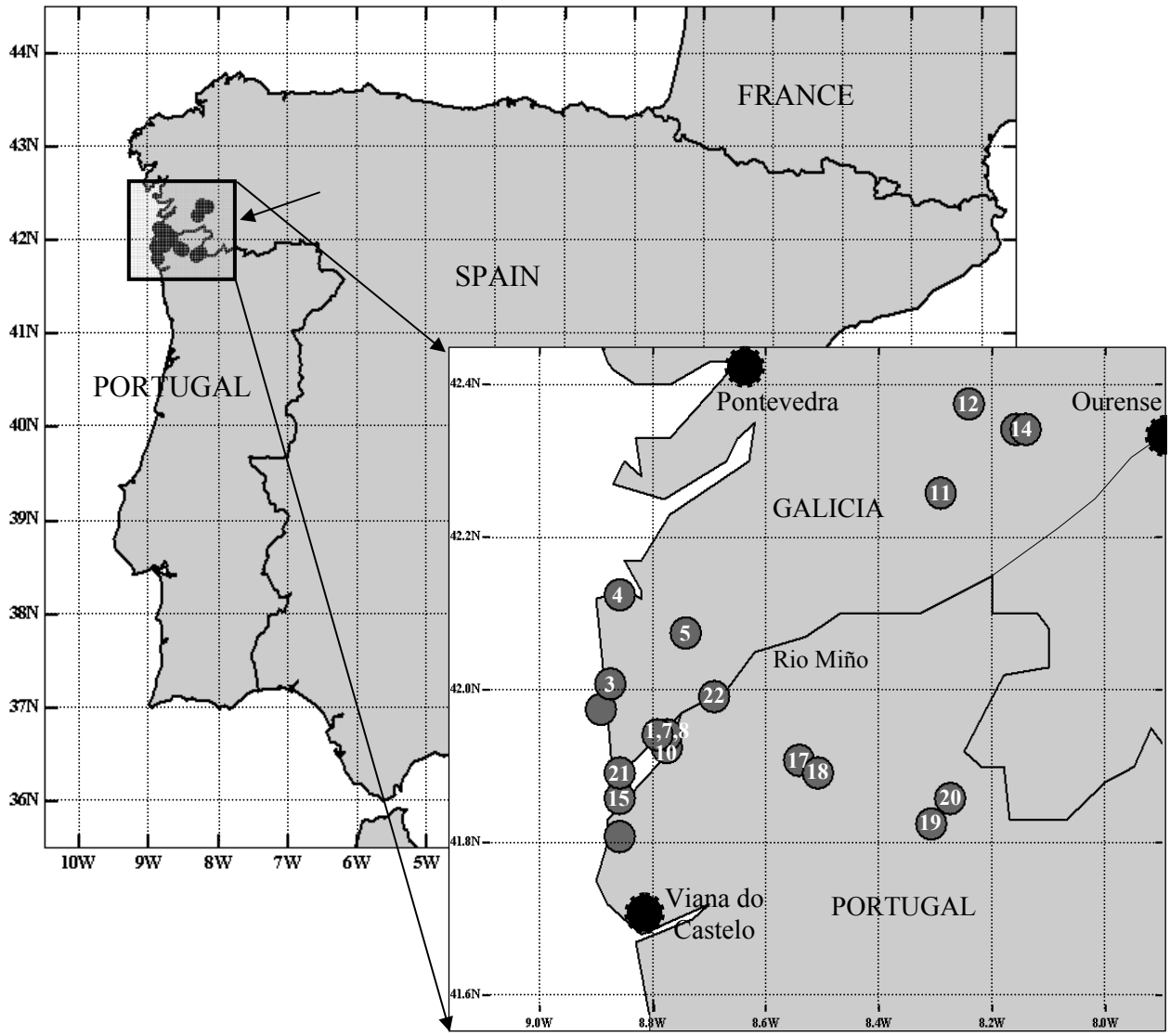


FIGURE 1: Map of Iberian Peninsula indicating survey area (top left) and enlargement of survey area (inset bottom right) to show location of sample sites in Galicia and northern Portugal**.**

TABLE 1: List of localities and habitats, from which geophilomorph specimens were collected

Site No.	Country	Province /Distrito	Locality and site details	UTM (29T)	Latitude-Longitude	Date of collection
1	Spain	Pontevedra	Finca Rio Miño, near Goián; Domestic garden	0519/4642	Not known	24.iii.2004
3	Spain	Pontevedra	Oia Harbour; Coastal site	0510/4650	42°00'06"N, 8°52'37"W	24.iii.2004
4	Spain	Pontevedra	Baiona; Coastal site	0511/4663	42°07'05"N, 8°51'56"W	24.iii.2004
5	Spain	Pontevedra	Gondomar; Deciduous woodland south of town	0520/4658	42°04'45"N, 8°44'59"W	24.iii.2004
7	Spain	Pontevedra	As Eiras; Alder *Alnus* wood	0519/4642	41°56'03"N, 8°46'06"W	25.iii.2004
8	Spain	Pontevedra	Between As Eiras & Goián; Inshore island, Rio Miño	0519/4642	41°55'54"N, 8°46'04"W	25.iii.2004
10	Spain	Pontevedra	As Eiras; Pine *Pinus* woodland	0517/4642	41°56'09"N, 8°47'08"W	25.iii.2004
11	Spain	Pontevedra	Puerto de Moncelos; Upland moorland	0558/4679	42°15'54"N, 8°17'48"W	26.iii.2004
12	Spain	Orense	Avión, valley of Rio Valdeiras; Mixed woodland	0562/4691	42°22'02"N, 8°14'29"W	26.iii.2004
14	Spain	Orense	Beade; Oak *Quercus* woodland, with chestnut & pine	0571/4688	42°20'27"N, 8°08'15"W	26.iii.2004
15	Portugal	Viana do Castelo	Caminho, Minho; Coastal woodland & dunes	0512/4635	41°51'02"N, 8°51'20"W	27.iii.2004
17	Portugal	Viana do Castelo	Castanheira; Oak *Quercus* woodland	0537/4639	41°54'09"N, 8°32'55"W	28.iii.2004
18	Portugal	Viana do Castelo	Vascões; Oak *Quercus* woodland	0540/4638	41°53'29"N, 8°30'37"W	28.iii.2004
19	Portugal	Viana do Castelo	Britelo; Roadside scrub & woodland	0557/4631	41°49'42"N, 8°18'31"W	28.iii.2004
20	Portugal	Viana do Castelo	Near Central de Lindoso power station; Wet woodland	0560/4634	41°51'34"N, 8°16'26"W	28.iii.2004
21	Spain	Pontevedra	Camposancos, near La Guardia; moorland "mid-slopes"	0511/4638	41°53'43"N, 8°51'55"W	29.iii.2004
22	Spain	Pontevedra	Amorin, Farmland; ditches & woodland verges	0525/4649	41°59'39"N, 8°41'31"W	29.iii.2004

TABLE 2: List of geophilomorph centipedes recorded, number of individuals collected at each site and summary of species data

(see Table 1 for details of each locality).

Family/Species	Spain												Portugal					No. of localities	No. of specimens	% abundance
	1	3	4	5	7	8	10	11	12	14	21	22	15	17	18	19	20			
Himantariidae																				
Haplophilus subterraneus															1			1	1	1.4
Schendylidae																				
Schendyla nemorensis							1											1	1	1.4
Schendyla peyerimhoffi			1															1	1	1.4
Dignathodontidae																				
Henia vesuviana	1									1	2					2	1	5	7	9.9
Linotaeniidae																				
Strigamia crassipes								1					2	2	1			4	6	8.5
Geophilidae																				
Arenophilus peregrinus																	1	1	1	1.4
Geophilus easoni		1		2		1	5	3	1		14	1	4	2	1			11	35	49.3
Geophilus osquidatum					1													1	1	1.4
Geophilus truncorum		2	1	1		1	3				1	2			1		1	9	13	18.3
Geophilius sp.					1													1	1	1.4
Gnathoribautia bonesis	1										3							2	4	5.6
Number of species per site:	**2**	**2**	**2**	**2**	**2**	**2**	**3**	**2**	**1**	**1**	**4**	**2**	**2**	**3**	**4**	**1**	**3**	**-**	**71**	**100%**

RESULTS

In total 71 specimens of geophilomorph centipede were collected, comprising 11 species. Species diversity at a given locality was generally low, with just one to two species collected from most sites, but this could reflect the group's bias towards collecting millipedes and woodlice. The species recorded and the sites at which they were found are shown in Table 2, which also summarises the number of localities from which each species was recorded and their relative abundance.

Full details of species records are given in the taxonomic listing presented below. The records consist of the locality number (see Table 1), the number of collected specimens (differentiated into males and females) and comments about their collection and the known occurrence of that species in north-west Iberia and more widely across Europe. Species nomenclature follows Bonato & Minelli (2014).

GEOPHILOMORPH CENTIPEDES COLLECTED

Family Himantariidae
***Haplophilus subterraneus* (Shaw, 1789)**

Portugal: Locality 18 (1 immature; SJG leg.)

A single immature specimen, 30mm in length, with 87 leg bearing segments (LBS), was collected from oak *Quercus* woodland at Vascões at about 500 metres asl. Although this specimen has more LBS than observed in Britain (Barber (2009) gives 77-83) this is in keeping with observations in lowland France where up to 89 LBS are reported (Brölemann, 1932). The specimen also lacks the virguliform fossae typical of British specimens, but Bonato & Minelli (2014) considered this to be not unusual in immature specimens (which were previously assigned to *H. s.* v*ar. complanta* Chalande & Ribaut, 1909).

Haplophilus subterraneus has a broad Atlantic distribution, being most frequent in western areas of Britain and France (Barber, 2009; Geoffroy & Iorio, 2009). However, it occurs widely across Western Europe from Spain northwards to Norway and eastwards to Poland (Minelli, et al., 2006 onwards), although interestingly Lindner (2007), in his review of this species' European distribution, did not mention any records occurring south of the Pyrenees.

Family Schendylidae
***Schendyla nemorensis* (C.L.Koch, 1837)**

Spain: Locality 10 (1♀; JGEL leg.).

A single female specimen, with 37 LBS, was collected in pine *Pinus* woodland near As Eiras.

This species is very widespread across Europe and has been recorded from north-west Africa (Maghreb). It occurs widely throughout Britain (Barber, 2009) and is reported to be very common in France, especially on forest soils (Geoffroy & Iorio, 2009).

***Schendyla peyerimhoffi* Brölemann & Ribaut, 1911**

Spain: Locality 4 (1♂; SJG leg.)

A single male specimen, with 37 LBS, was collected from beneath stones on coastal grassland near Baiona about 100m inland from the high tide level.

Considering its wide occurrence along the southern and western coasts of England and Wales (Barber, 2009), it seems surprising that there is just a single French record of *S. peyerimhoffi*, from the coast of Brittany (Geoffroy & Iorio, 2009). It has also been recorded from Portugal, where it occurs inland, and the Canary Isles and Morocco.

Family Dignathodontidae
***Henia vesuviana* (Newport, 1845)**

Spain: Localities: 1 (1♀; SJG leg.); 14 (1♀; JPR leg.); 21 (2♀; SJG, JGEL leg.)

Portugal: Localities: 19 (2♂; JGEL leg.); 20 (1♀; JPR leg.)

Found at five sites, this was the third most frequently recorded geophilomorph. The two males with 73 and 87 LBS, the largest reaching 47 mm in length. The females ranged between 83 to 87 LBS, reaching up to 53 mm.

Specimens were collected from beneath stones and dead wood at ground level, in a wide range of habitats including a domestic garden, mature deciduous woodland and open moorland.

Although this species distribution is centered on the western Mediterranean, including Portugal and Spain, it occurs widely throughout Europe (Lindner, 2007), and possibly also in northern Africa. It is widely distributed and fairly common in France (Geoffroy & Iorio, 2009), though it becomes decidedly local further north in southern Britain (Barber, 2009).

Family Linotaeniidae
***Strigamia crassipes* (C.L.Koch, 1835)**

Spain: Locality 11 (1♀; SJG leg.)

Portugal: Localities 15 (2♂; SJG, HJR leg.); 17 (2♂; JGEL, RDK leg.); 18 (1♀; JGEL leg.)

This species was recorded at four localities, including open moorland, oak Quercus woodland and coastal woodland.

Males with 45 or 47 LBS. The largest specimen, at 24 mm in length, with 18+16 coxal pores. Females with 47 or 49 LBS. The largest 26 mm long, with 14+12 coxal pores.

Although the range in LBS is slightly lower than seen in typical British specimens (Barber, 2009) specimens with 47 LBS are known in south Wales (Owen & Barber, 2014) and also in Italy (Bonato & Minelli, 2014). All specimens clearly showed a very slightly pigmented median cleft on the sternites characteristic of *S. crassipes*, and in those examined, the setae behind the anterior margin of the head occurred as a single continuous row, as noted by Iorio (2005).

This species has a holarctic distribution across Europe including mainland Portugal and Spain. It is common in France (Geoffroy & Iorio, 2009) and southern Britain (Barber, 2009).

Family Geophilidae
***Arenophilus peregrinus* Jones, 1989**

Portugal: Locality 20 (1♀; JGEL leg.)

A single female specimen, 15 mm in length, with 47 LBS, was collected from under stones in open pine *Pinus* woodland near Central de Lindoso power station.

This species was first described from the Isles of Scilly (Jones, 1989), and is otherwise only known from two sites in Cornwall (Barber, 2009). Its discovery in northern Portugal suggests that it may have a widespread Atlantic distribution (and may have been overlooked in western France and Spain).

***Geophilus easoni* Arthur *et al*, 2001**

Spain: Localities 3 (1♀; JPR leg.); 5 (1♂, 1♀; SJG, HJR leg.); 8 (1♀; SJG leg.); 10 (1♂, 4♀; SJG leg.); 11 (1♂, 2♀; SJG, JGEL leg.); 12 (1♀; SJG leg.); 21 (4♂, 10♀; SJG, JGEL, HJR, JPR leg.); 22 (1♀; JPR leg.)

Portugal: Localities 15 (2♂, 2♀; SJG, JPR, JGEL leg.); 17 (1♂, 1♀; SJG, PL leg.); 18 (1♀; SJG leg.)

This was by far the most frequently recorded geophilomorph, with 35 specimens collected from eleven sites representing almost half of all the geophilomorph specimens collected. It was found in a wide array of habitats including, coastal grassland, oak *Quercus* woodland, pine *Pinus* woodland and upland moorland. All specimens were a uniform tan-orange in colour and were collected from beneath stones and dead wood at ground level.

Males typically had 51 or 53 LBS (one specimen with 47). The largest male was 36mm in length, with 7+8 coxal pores on the ultimate leg-bearing segment. Females mostly with 53 or 55 LBS (one specimen each with 49 and 51). The largest reaching 55mm, with up to 18+18 coxal pores.

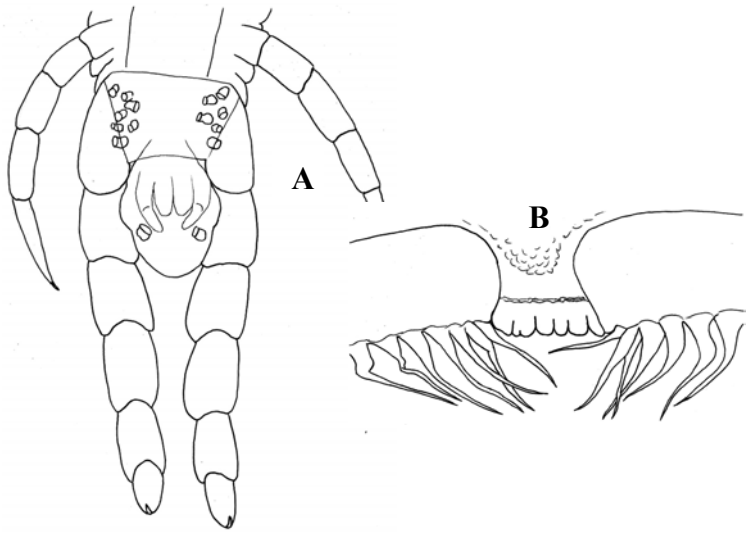


FIGURE 2: *Geophilus easoni* Arthur *et al* 2001, male, 34mm long, with 53 leg bearing segments. Locality 21; Camposancos 'mid-slopes, moorland.
A) posterior extremity, ventral view, showing pores in coxopleuron; B) labrum, showing teeth of mid-piece, ventral view.

TABLE 3: Comparison of *Geophilus easoni* specimens collected from north-western Iberia with typical British *G. easoni* and *Geophilus carpophagus*

Character	*Geophilus easoni* North-western Iberia	*G. easoni* ~ UK (after Barber, 2009)	*G. carphophagus* ~ UK (after Barber, 2009)
Number of leg bearing segments	Male: (47) 51-53 Female: (49,51) 53-55	Male: 47-49 Female: 49-51	Male: 51-55 Female: 53-57
Adults: number of coxal pores	7-14 Typically easy to see	6-12 Typically easy to see	4-8 Often obscure
Labral mid-piece	Teeth stout, rounded, darker than side pieces	Teeth stout, rounded, darker than side pieces	Teeth elongate and pointed; same colour as sides
Max. length	to 55 mm	to 40 mm	to 60 mm
Body colour	Uniform tan/chestnut	Uniform tan/chestnut, any purple mottling feeble	Often strongly patterned with purple pigment
Typical habitat	Rural woodland, moorland	Rural woodland, moorland	Often synanthropic or coastal
Favoured microsites	Typically on ground surface, under stones, dead wood, etc.	Typically on ground surface, under stones, dead wood, etc.	Typically above ground level, on walls, tree trunks, rock faces, sea cliffs, etc.

Although most specimens have more LBS, and are larger, than described material (Arthur, *et al*, 2001) they otherwise conform to typical *G. easoni* in other aspects, such as the number of coxal pores and the darkly pigmented mid-piece of the labrum which bears blunt teeth (Fig. 2; Table 3). The number of leg bearing segments is known to be conspicuously variable within many geophilomorph species (Bonato & Minelli, 2014).

Beyond the British Isles typical specimens of *G. easoni* appears to be restricted to the Atlantic influenced extreme western parts of France (Geoffroy & Iorrio, 2009) as far south as the foothills of the Pyrenees (Gregory & Barber, 2010). However, it is probable that elsewhere in Europe the actual distribution is confused with that of *G. carpophagus s. str*. and possibly related species (Bonato and Minelli, 2011).

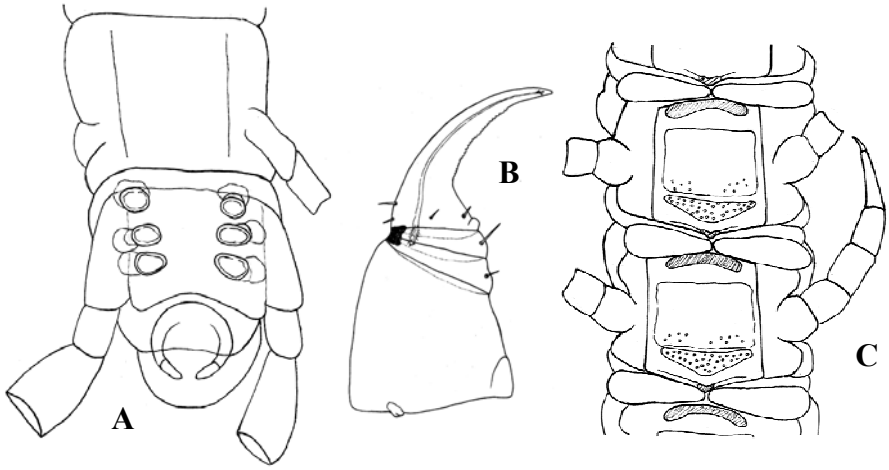


FIGURE 3: *Geophilus osquidatum* Brolemann, 1909, male, 32mm long, with 55 leg bearing segments. Locality 7; As Eiras, *Alnus* woodland.
A) terminal sternites, ventral view, showing 3+3 pores in coxopleuron; B) forcipule, ventral view; C) sternites 8-10, ventral view, showing fossae and sternal pore groups.

Geophilus osquidatum Brölemann, 1909

Spain: Locality 7 (1♂; SJG leg.)

A single male specimen (Fig. 3), 30 mm in length, with 55 LBS was collected from beneath dead wood in alder *Alnus* woodland, near As Eiras.

Geophilus osquidatum has a broad Atlantic distribution and is most frequent in Western Europe, occurring from mainland Spain through western France (Geoffroy & Iorio, 2009) to Britain and Ireland (Barber, 2009). Scattered records occur in Italy, Czech Republic and Germany.

***Geophilus truncorum* Bergsøe & Meinert, 1866**

Spain: Localities 3 (2♀; SJG leg.); 4 (1♂; JGEL leg.); 5 (1♀; JGEL leg.); 8 (1♂; JPR leg.); 10 (1♂, 2♀; HJR leg.); 21 (1♂; JGEL leg.); 22 (1♂, 1♀; HJR leg.)

Portugal: Localities 18 (1♂; SJG leg.); 20 (1♀; SJG leg.)

This was the second most widely recorded geophilomorph (after *G. easoni*), with 13 specimens (18% of those collected) found at nine sites. Specimens were mainly found beneath bark and within dead wood in a variety of habitats, including coastal sites, pine *Pinus* woodland, oak *Quercus* woodland, and open moorland.

Geophilus truncorum has a broad Atlantic distribution. There are records from Morocco, Portugal and Spain (Minelli *et al*., 2006 onwards) and it is widely distributed in western France (Geoffroy & Iorio, 2009) and occurs throughout Britain and Ireland (Barber, 2009). Although most frequent in Western Europe, it reaches Poland and Italy.

***Geophilus* sp.**

Spain: Locality 7 (1♂; SJG leg.)

A single male specimen was collected from beneath dead wood in damp alder *Alnus* woodland near As Eiras. This is a lowland, riverine habitat. Despite having a number of distinctive features (described below) it has not proved possible to make a definitive determination. In the mean time a brief description given here.

The specimen is 18 mm in length by 0.6 mm wide (at the widest point) and with 43 LBS. Given its relatively small size it may be immature. It has the typical appearance of a *Geophilus* species. The head is longer than broad; the forcipular tergite is trapezoidal; carpophagus fossae are present on sternites two to twelve (Fig. 4B); and the sternites bear traverse pore groups towards the posterior margin, with three shallow longitudinal 'gutters' running the full length of the body. The forcipules are relatively short and stout, with the tarsungulum bearing a small, but pronounced, denticle at its base (Fig. 4C). The first maxillary telopodite bears a prominent claw (Fig. 4D). Of significance is that the coxal pores of the ultimate leg pair (which number 11+12) cover the entire ventral surface of the coxopleura (Fig. 4A). The ultimate legs of are slightly swollen and terminate in a prominent claw.

The distribution of coxal pores over the entire ventral surface of the coxopleura suggests an affinity to the *Geophilus pyrenaicus* species complex. Examination of Table 4 indicates that it is most similar to *G. pyrenaicus* Chalande, 1909, but considering its small size it has too many coxal pores.

It has far too few LBS to be *G. chalandei* Brölemann, 1909, or *G. studeri* Rothenbühler, 1899, (minimum 59 or 53, respectively). In addition, all known nominal species within this complex are recorded from upland areas from the Pyrenees to the Alps. None are known from lowland regions, or from the Iberian Peninsula south of the Pyrenees.

Considering its small size, the relatively large number of coxal pores and its geographic location, this may be a new species.

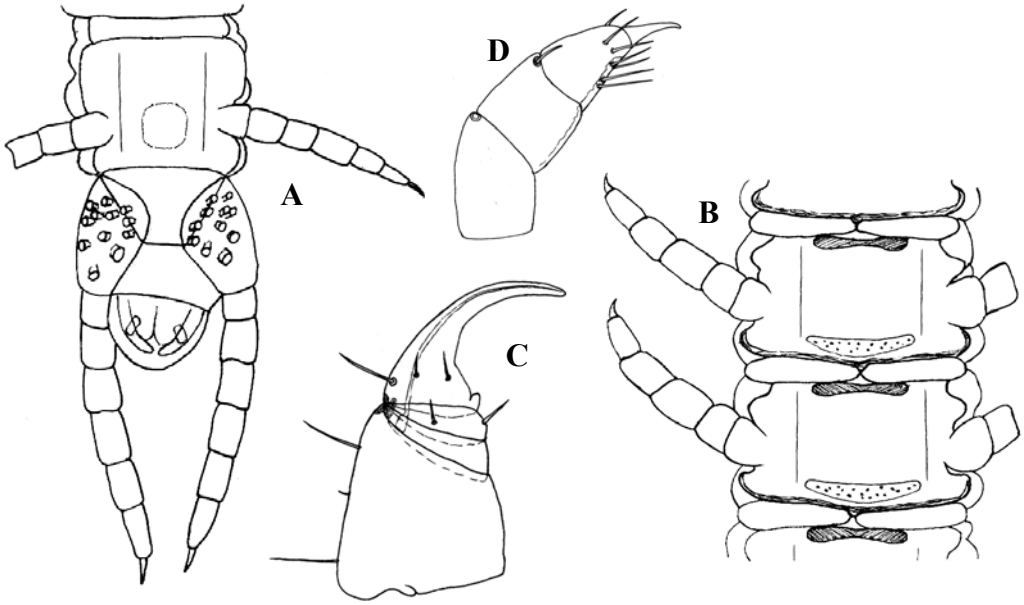


FIGURE 4: *Geophilus* sp., male, 18mm, with 43 leg bearing segments. Locality 7; As Eiras, *Alnus* woodland.

A) posterior extremity, ventral view; B) trunk segments 8-9, ventral view; C) forcipule, ventral view; D) first maxillary telopodite, ventral view.

TABLE 4: Comparison of *Geophilus* sp. collected from site 7 with other nominal species within the *Geophilus pyrenaicus* species complex and with *G. alzonis* Attems.

(Data initially compiled by Lucio Bonata, January 2011, synonymy follows Bonato & Minelli, 2014)

Nominal species	Current status	No. of LBS	Coxal pores	Max. length	Published records
***Geophilus* sp. ♂, Locality 7**	**unknown**	**43**	**11+12**	**18 mm**	**Galicia, lowland**
G. pyrenaicus Chalande, 1909	valid species	43-51(-69)	4-10	30 mm	Pyrenees & Massif Central
G. chalandei Brolemann, 1909	valid species	59-71	11-15	44 mm	Pyrenees
G. studeri Rothenbühler, 1899	valid species	53-57	8-21	35 mm	Central-Western Alps
G. padbergi Verhoeff, 1939	= *studeri*	55	6-8	17 mm	Mountains, SW Germany
G. silvaenigrae Verhoeff, 1937	= *studeri*	55	8	23 mm	North-western Alps
G. alzonis Attems, 1952	unknown [#]	37-51	5-10 [#]	?	Spain

[#] In *G. alzonis* the ventral pores of the coxopleuron lie close to margin of metasternite. A nominal species of uncertain validity (Bonato & Minelli, 2014)

***Gnathoribautia bonesis* (Meinert, 1870)**

Spain: Localities 1 (1 specimen; SJG leg.); 21(1♂, 2 immatures; HJR, SJG leg.)

All specimens with 79 LBS. One specimen was found among debris in a domestic garden; the remainder beneath dead wood and stones on upland (but coastal) moorland.

Gnathoribautia bonesis inhabits the western Mediterranean region. In addition to Spain and Portugal, it also occurs in Algeria, Morocco and Tunisia in North Africa, and off shore islands such as the Canaries and the Azores. It has also been recorded from Sicily (Italy).

DISCUSSION

In total, 11 species of geophilomorph centipede were collected during the BMIG field meeting in Galicia in 2004. Two species, *Geophilus easoni* and *G. truncorum*, proved to be very widespread and numerous in the region. Recorded from eleven and nine localities, respectively, they account for 68% of the geophilomorph specimens collected (Table 2). Two additional species, *Henia vesuviana* and *Strigamia crassipes*, were also frequently encountered. These four species were collected from a wide range of habitats. The remaining species were encountered in small numbers at one or two sites.

One species of *Geophilus* remains undetermined and may be a new species. The brief description of this species provided should allow any future specimens to be recognised, pending clarification of their true identity. Although the distribution of pores on the coxopleura of the ultimate legs suggests an affinity to the *Geophilus pyrenaicus* species complex, the large number of coxal pores, relative to its small size, rules out the known described species, which all occur in upland areas from the Pyrenees to the Alps (Table 4). The specimen also bears some similarity to *G. alzonis* Attems, 1952, which has been recorded from north-west Spain (Pamplona), including the number of leg bearing segments and number of coxal pores. However, the coxal pores in *G. alzonis* are stated to lie close to margin of metasternite (as in most *Geophilus*) and not scattered over the entire ventral surface, as in the unidentified specimen. Bonato & Minelli (2014) consider *G. alzonis* to be a nominal species whose actual taxonomic value remains uncertain because its morphology is inadequately known. Thus, it is highly desirable to collect addition material of this unidentified species in order to confirm whether or not it is an anomalous specimen of a known species, or if it is new.

Recent studies indicate that *Geophilus carpophagus* comprises a group of closely related species (the *Geophilus carpophagus* species-complex) which have a broad distribution from northern Africa and across Europe (Bonato and Minelli, 2011). So far only three species have been clearly distinguished; *G. carpophagus s. str.* Leach, 1814, and *G. easoni* Arthur, *et al*, 2001, from Europe and *Geophilus arenarius* Meinert, 1870, from North Africa. The confirmed records for *G. easoni* suggest that it has a strict Atlantic distribution extending from Britain and Ireland and through western France to at least the foothills of the Pyrenees (Gregory & Barber, 2010). Thus, its occurrence in north-western Iberia is not unexpected. Although having a wider range of leg bearing segments (47-55) compared to the UK (47-51) it is not unusual for geophilomorph centipedes to show regional variation in this character (Bonato & Minelli, 2014).

The discovery of *Arenophilus peregrinus* in northern Portugal is of great significance. The few other known records for this species are from south-western Britain (Barber, 2009). On the basis that other known species of *Arenophilus* occur in North America, Jones (1989) suggested that *A. peregrinus* may have been imported to the Isles of Scilly (the type locality) with introduced exotic plants.

Unfortunately, its subsequent discovery on the Cornish mainland at a coastal site (Gregory & Jones, 1999) and inland woodland (Barber, 2008) has not helped clarify its status as an imported or native species in Britain. In light of the Portuguese record, it is seems probable that *A. peregrinus* is a genuine native of Western Europe and therefore, considering the paucity of records, should be considered to be of high conservation status. Other taxa, such as the woodlouse genus *Miktoniscus* Kesselyak, 1930 (Isopoda: Oniscidea), are known to include native species from both side of the Atlantic Ocean. Unfortunately, *A. peregrinus* is inconspicuous and likely to be under-recorded. Additional data from targeted surveys of the Atlantic coasts of Europe and the USA will help elucidate its status in Europe.

It is apparent that the majority of the geophilomorph species recorded exhibit Atlantic distributions, favouring the mild and humid conditions found in Western Europe. Five species, *Haplophilus subterraneus*, *Schendyla nemorensis*, *Geophilus easoni, G. osquidatum* and *G. truncorum* have broad Atlantic distributions that penetrate, to a greater or lesser extent, eastwards into central Europe. Occurring along the western European coastline *Schendyla peyerimhoffi* has a strict Atlantic distribution. It is possible that *Arenophilus peregrinus*, previously only known from south-west England, and the unidentified *Geophilius* sp. may also have strict Atlantic distributions. In contrast the genera *Henia* and *Gnathoribautia* have their highest species richness centred on the Mediterranean region (Bonato & Minelli, 2009), with both *H. vesuviana* and *G. bonesis* having western (occidental) Mediterranean distributions. The exception to these distribution patterns is *Strigamia crassipes*, a centipede with a broad holartic distribution, which occurs widely throughout Europe.

This field trip has filled some gaps in previous faunistic knowledge of north-west Iberia and has helped to put our own British and Irish fauna into a broader European perspective. None-the-less, our knowledge of the geophilomorph fauna of north-west Iberia remains far from complete.

ACKNOWLEDGEMENTS

SG wishes to thank Lucio Bonato for his helpful discussion regarding the possible identity of the undetermined *Geophilus* sp., *Henia vesuviana*, and other species.

We are grateful to our colleagues Desmond Kime, Paul Lee, Helen Read and Paul Richards who freely offered their specimens for examination.

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. (2008) Some recent Cornish myriapod records. *British Myriapod & Isopod Group Newsletter*. **17**: 3-4 (*unpublished*).

Barber, A.D. (2009) *Centipedes*. Synopses of the British Fauna (New Series) **58**. Shrewsbury, Field Studies Council. pp. 96.

Bonato, L. & Minelli, A. (2009) Geophilomorph centipedes in the Mediterranean region: revisiting taxonomy opens new evolutionary vistas. *Soil Organisms* **81**: 489–503.

Bonato, L. & Minelli, A. (2011) *Geophilus arenarius*, a long-misunderstood species in the still unresolved *carpophagus* species-complex (Chilopoda: Geophilidae). *Zootaxa* **3114**: 40–49.

Bonato, L. & Minelli, A. (2014) Chilopoda Geophilomorpha of Europe: a revised list of species, with taxonomic and nomenclatorial notes. *Zootaxa* **3770 (1)**: 001–136.

Brolemann, H.W. (1932) Éléments d'une Faune des Myriapodes de France, Chilopodes. *Faune de France*, **25**. Imprimerie Toulousiane.

Geoffroy, J-J & Iorio, E. (2009) The French centipede fauna (Chilopoda): updated checklist and distribution in mainland France, Corsica and Monaco. *Soil Organisms* **81**: 671-694.

Gregory, S. & Barber, A.D. (2010) Observations of a population, including juveniles, of *Geophilus carpophagus* Leach, 1815, *sensu stricto* from Oxfordshire. *Bulletin of the British Myriapod & Isopod Group* **24**: 2-15.

Gregory, S.J. & Jones, R.E. (1999) *Arenophilus peregrinus* Jones, 1989 in Cornwall: a centipede new to mainland Britain. *Bulletin of the British Myriapod Group* **15**: 28-29.

Gregory, S.J., Lee, P., Read, H.J. & Richards, J.P. (2012) Woodlice (Isopoda: Oniscidea) collected from northwest Spain and northern Portugal in by the British Myriapod and Isopod Group. *Bulletin of the British Myriapod and Isopod Group* **26**: 6-23.

Iorio, E. (2005): *Strigamia transsilvanica* (Verhoeff, 1928), espèce nouvelle pour la faune de France (Chilopoda, Geophilomorpha, Linotaeniidae). *Bulletin de la Société linnéenne de Bordeaux* (NS) **140**: **33**(3), 195-198.

Jones, R.E. (1989) On a new species of centipede (Chilopoda, Geophilomorph) from the Isles of Scilly. *Journal of Natural History* **23**: 627-633.

Lindner, E.N. (2007) Einige Anmerkungen zum Vorkommen von *Stigmatogaster subterraneus* (Shaw, 1789) und *Henia vesuviana* (Newport, 1845) (Chilopoda: Geophilida) in Deutschland sowie Überblick über deren Verbreitung in Europa. *Schubartiana* **2**: 49-56.

Mauriès, J.P. (2005) Attempt at a classification of Glomerida (Diplopoda), with descriptions of two new genera from the northwest of the Iberian Peninsula. *Arthropoda Selecta* **14**: 241-249.

Minelli A., Bonato L., Dioguardi R. *et al*. (2006 onwards) Chilobase: a web resource for Chilopoda taxonomy**.** Publicly searchable at http://chilobase.bio.unipd.it

Read, H.J. (2007) The millipede genus *Cylindroiulus* Verhoeff, 1894 in North-west Spain and northern Portugal: recent records and descriptions of four new species (Diplopoda, Julida, Julidae). *Graellsia* **63**: 279-294.

Owen, C. & Barber, A.D. (2014) Abnormal coxal pores in a specimen of *Strigamia crassipes*. *Bulletin of the British Myriapod & Isopod Group* **27**: 36-37.

CERATOSPHYS AMOENA RIBAUT, 1920 AND *HYLEBAINOSOMA NONTRONENSIS* MAURIÈS & KIME, 1999 NEW TO BRITAIN (DIPLOPODA: CHORDEUMATIDA)

Mark G. Telfer[1], Steve J. Gregory[2], R. Desmond Kime[3], Christian Owen[4] and Jörg Spelda[5]

[1] 10, Northall Road, Eaton Bray, Dunstable, Bedfordshire, LU6 2DQ, UK.
E-mail: mark.g.telfer@btinternet.com

[2] 200 Ock Street, Abingdon, Oxfordshire, England, OX14 5DR, UK.
E-mail: stevejgregory@btopenworld.com

[3] La Fontaine, 24300 La Chapelle Montmoreau, France.
E-mail: deskime2@aol.com

[4] E-mail: christian.owen49@yahoo.com

[5] Zoologische Staatssammlung München, Münchhausenstr. 21, 81247, München, Germany.
E-mail: spelda@zsm.mwn.de

ABSTRACT

Two species of millipede are recorded new to Britain: *Ceratosphys amoena* Ribaut, 1920 (Chordeumatida: Opisthocheiridae) and *Hylebainosoma nontronensis* Mauriès & Kime, 1999 (Chordeumatida: Haaseidae), having been discovered together at Bargoed, Glamorganshire, in September 2014. Both are described and illustrated in detail, enabling their identification. British records are reviewed. Summary information is provided on the foreign distribution and habitats of both species. It is noted that the British specimens of *C. amoena* match the description of *Ceratosphys confusa* Ribaut, 1955, currently treated as a synonym of *amoena*. For *H. nontronensis*, it is noted that Welsh specimens possess a prominent spine on the gonopod which is apparently absent from the holotype; presumably intra-specific variation but meriting further research. Uncertainties in the generic placement of nontronensis are briefly discussed. The question of whether both species are native to Britain or have been introduced is debated at some length, generating testable predictions and proposals for genetic analyses of these millipedes and of other invertebrates with similar geographical distributions.

INTRODUCTION

On 28th September 2014, MGT and David J. Gibbs, along with Jo Hodgkins and Bradley Telfer, arranged to meet up with CO at Bargoed, on the Glamorganshire (VC 41) side of the Rhymney Valley, South Wales. MGT and DJG were keen to see some of the more unusual invertebrate species which CO has found in this area, including the Ghost Slug *Selenochlamys ysbryda* Rowson & Symondson, 2008, the harvestman *Sabacon viscayanum* Dresco, 1952, the millipede *Propolydesmus testaceus* (C.L. Koch, 1847) and the centipede *Lithobius tricuspis* Meinert, 1872. While searching (successfully) for these species, some millipede specimens were collected for later identification.

Our samples were found to contain two species which had not previously been recorded from Britain: *Ceratosphys amoena* Ribaut, 1920 (Chordeumatida: Opisthocheiridae) and *Hylebainosoma nontronensis* Mauriès & Kime, 1999 (Chordeumatida: Haaseidae). For a more detailed, informal account of the field meeting and the subsequent discovery of these two millipedes, see Telfer (2014a, b).

CERATOSPHYS AMOENA RIBAUT, 1920

Discovery

The first British specimen to be recognised was a male collected by MGT from the underside of a log in beech *Fagus* woodland at Groes-faen Wood (c. SO143007), along a footpath between the hairpin bend in the A469 road and Groes-faen Farm. It was provisionally identified as *Craspedosoma rawlinsii* Leach, 1814 in the field, with which it shares similar colouration and patterning, but an examination of the gonopods and paragonopods suggested it was a species new to Britain. This was confirmed by SJG and RDK and the specimen was first identified as *Ceratosphys amoena* by JS on 9th October, from photographs and sketches.

Foreign distribution and habitats

Ceratosphys amoena occurs in the contiguous Departments of Tarn, Aude, Ariège, Haute-Garonne and Hautes-Pyrénées in south-western France. Within this range, the form *confusa* Ribaut, 1955 is the most widespread form, occurring in the Departments of Tarn, Aude, Ariège and Haute-Garonne, the forms *amoena sensu stricto* Ribaut, 1920, *taurus* Ribaut, 1956 and *dentata* Ribaut, 1956 are only known from Ariège and the form *aurensis* Mauriès, 1966 only from Hautes-Pyrénées. In addition, RDK has found *C. amoena* (form *confusa*) on several occasions in the Meuse valley in Belgium, collected from deep litter in forested areas, often on Carboniferous limestone.

Identification

Using Blower (1985), *Ceratosphys amoena* will key either to *Nanogona polydesmoides* (Leach, 1814) due to its well-developed paranota, or to *Craspedosoma rawlinsii* if emphasis is placed on its body length (11 - 12.5 mm). In the field it is easily confused with the latter. However, it differs from both in its smaller size, its relatively long macrosetae and its distinct body pigmentation. Mature male specimens may be readily identified from the distinctive profile of the gonopods in lateral view.

Description

This description is based on recently collected material, 3 males and 3 females, preserved in 70% isopropyl alcohol.

Adults with 30 body rings (pleurotergites) and therefore mature at stadium IX. Males are between 11.0 and 12.0 mm in length, body height some 0.9 mm (15th body ring). Females are slightly larger, up to 12.5 mm long, by 1.0 mm ring height.

Head with frons flattened in males, slightly convex in females. Antenna length about 1.75 mm in males and females. Eyes comprise 26 - 27 well pigmented ocelli arranged in a broad equilateral triangle (Fig. 1A), typically arranged in vertical rows of 1, 7, 6, 5, 4, 3 and 1.

Body colour highly characteristic. Much of the dorsal surface, including the dorsal surface of the paranota, is orange brown, with a contrasting dark brown longitudinal stripe, about ¼ the width of the body (including paranota), running the entire length of the animal. The lateral parts, below the paranota are also dark brown (Figs. 3 & 4). Dorsal parts of body smooth, but lateral areas between and beneath paranota with fine striae.

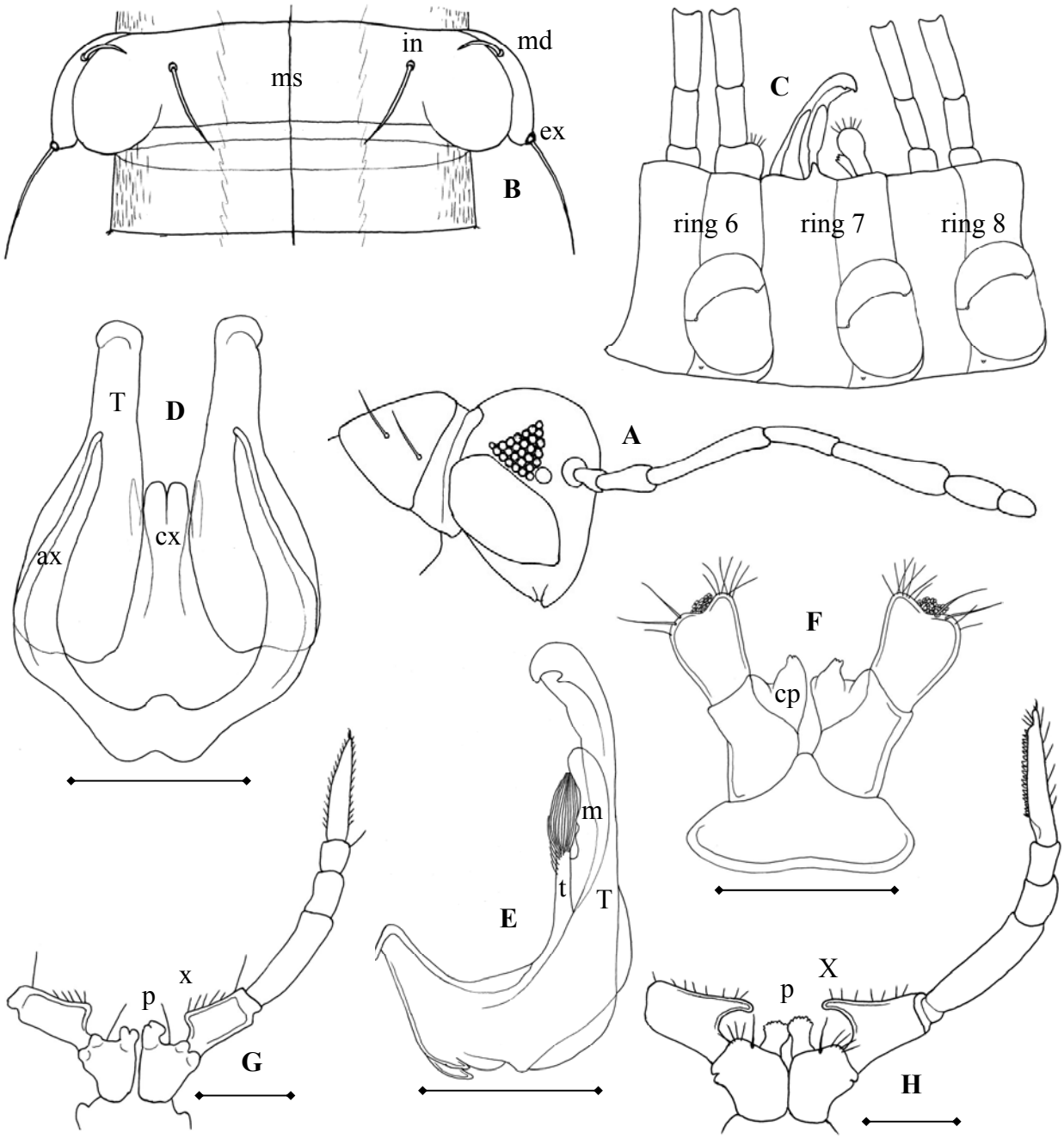


FIGURE 1: ***Ceratosphys amoena*** **from Groes-faen Wood.**
A) Female, head and antenna, right lateral view. B) Female, body ring 15, dorsal view. C) Male, body rings 6, 7 & 8, right lateral view. D) Male, gonopods (leg pair 8), anterior view. E) Male, telopodite (leg pair 8), left lateral external view. F) Male, paragonopods (leg pair 9), anterior view. G) Male, leg pair 10, anterior view. H) Male, leg pair 11, anterior view. All scale bars = 0.25 mm.

Paraterga (paranota) expanded laterally as a low keel, and very prominent in dorsal view (Figs. 1B & 3), though not as pronounced as seen in *Nanogona polydesmoides*.

Tergites each with three pairs of macrosetae; each macroseta elongated and gently curved to a fine point (Fig. 1B). The length of the longest exceeds the length of the associated metazonite. The external (ex) and median (md) macrosetae sit laterally on the paranotal keel. The internal macroseta (in) sits dorsally above the main bulge of the paranota.

On body ring 15, the angle formed by the bases of the three macrosetae is about 95-105°. The distance between bases of external and median macrosetae approximately equal to distance between bases of median and internal macrosetae (ring 15 examined). The distance between medial suture (ms) and base of internal macroseta slightly greater than distance between bases of median and internal macrosetae.

Male: leg pairs 1 to 7

In males, leg pairs 1 and 2 are much reduced in size, contrasting with leg pairs 3 - 7 which are more robust than other walking legs (or those of females). Coxa of leg 7 (6^{th} body ring) expanded posteriorly into a small bulge (Fig. 1C).

Male: gonopods (leg pair 8)

The gonopods are not fully retracted into the body and in lateral view are of highly characteristic shape, visible even in the live animal (Figs. 1C & 1E). The telopodites are divided into two branches. In lateral view, the longer anterior branch (T) initially tapers from its base but beyond mid height it becomes slightly swollen and distally curves over to form a hooded tip. The shorter posterior branch (t) is about half this length, the distal part fringed by a brush of long dark hairs. Between the two telopodite branches lies a translucent membranous structure (m), with a convex anterior edge, and a sinuous posterior edge.

In anterior view (Fig. 1D) the main branch of the telopodite (T) tapers from its broad base to a wide rounded tip. The smaller posterior 'brush' is hidden from view. The elongated lateral horn of the horseshoe shaped angiocoxite (ax) sits anterior to, and rises beyond mid-height of, the telopodites. The colpocoxite (cx) is a wide blade lying centrally and posterior to the telopodites. It has four lobes apically. The larger rounded median pair is visible between the telopodites. The narrow exterior lobes are obscured from view.

Male: paragonopods (leg pair 9)

Paragonopods are reduced, consisting of two articles, rising from a subtriangular sternal plate (Fig. 1F). Basal article bears on its internal edge a prominent conical process (cp). Terminal article is split into two distal lobes. The external lobe is rounded and bears a few stout setae. The internal lobe is more triangular and bears a number of finer setae.

Male: leg pair 10

Coxae with medially directed swollen process (p) on their internal face (Fig. 1G). Base of prefemur with a small rounded lobe on its internal face (x).

Male: leg pair 11

Internal face of coxae with medially directed swollen process (p) covered in small dimples (Fig. 1H). Ventral edge of prefemur with strong extension (X) which tapers to a curved rounded tip directed towards its base. Metatarsus bears a row of scale-like setae on its internal face.

Female characters

In females all leg pairs are normally developed, with medial pairs longest, gradually decreasing in length towards the head and telson. Female vulvae were not examined.

Variation and the taxonomic status of *Ceratosphys confusa* Ribaut, 1955

Welsh specimens clearly match the description of *Ceratosphys confusa* Ribaut, 1955, which was described by comparison to *amoena*, with the principal differences being in the structure of the gonopods and paragonopods. Mauriès (1978) treated *confusa* as a subspecies of *amoena*. By omitting *confusa* altogether, it seems Demange (1981) and the authors of the Fauna Europaea (http://www.faunaeur.org/experts.php?id=42) myriapod pages may have opted to treat *confusa* as a mere synonym of *amoena*.

On first impression, Ribaut's illustrations of the gonopods and paragonopods of *amoena sensu stricto* and *confusa* seem strikingly different and it is difficult to understand how they could be regarded as synonymous. However, detailed studies of variation within and between millipede species, such as JS's studies of genus *Rhymogona* (Spelda, 1999), have revealed the potential for enormous intraspecific variation, analogous to the variation in antler structure of Red Deer *Cervus elaphus* Linnaeus. Similar detailed studies of genus *Ceratosphys* are much needed. In the meantime, we treat *confusa* as a form of *amoena*, while noting that if form *confusa* were to be elevated to subspecies or species status, it is *confusa* rather than *amoena sensu stricto* that we have found in Wales.

Ceratosphys amoena was described as 11 mm long (Ribaut, 1920) and *C. confusa* was described as being the same size as *amoena* (Ribaut, 1955). Our Welsh specimens thus appear to be somewhat larger at 11 - 12.5 mm. *C. amoena* was also described as having 25 ocelli in six rows of 1, 7, 6, 5, 4 and 2, fewer than the 26 - 27 ocelli found in Welsh specimens.

British records

CO has checked all the specimens standing as *Craspedosoma rawlinsii* in the National Museum of Wales, Cardiff. One sample proved to be of *Ceratosphys amoena*: 2 males and 1 ?female, Under bark of dead wood, Cefn Onn, South Glamorgan (ST177840), 11th November 1983, leg. and det. N. Nethercott, NMW.Z.1984.010.00029.

CO began recording millipedes in September 2011 after acquiring a copy of Blower (1985). A check of the specimens labelled as *Craspedosoma rawlinsii* in his collection has yielded two records made in October and November of that year (Table 1).

CO returned to the Groes-faen Wood on 5th October and collected further specimens of *C. amoena* by sieving leaf-litter. Subsequent fieldwork by CO has found *C. amoena* to be fairly common in the Welsh Valleys, occurring in a range of habitats including rough grassland, brownfield sites, an old overgrown landfill site, an unkempt cemetery, Rhôs pasture, Heather *Calluna vulgaris* and

Whinberry *Vaccinium myrtillus* heathland, Bracken *Pteridium aquilinum* heathland, hedgerows and woodland (including wet woodland). It has been found at the edge of a conifer plantation but the interior of the plantation has not yet been surveyed. It has been found by searching leaf-litter, turning over logs and stones, and by torchlight searching of rocks for active individuals. It has also been found in association with decaying wood: under bark of a standing dead tree, in a rot-hole 8ft up an apple tree, and in rotten wooden fence-posts.

From west to east, *C. amoena* has been recorded in the Taff Valley (ST08989264, Coed Pant-du Isaf, Cilfynydd), widely in the Rhymney Valley and also in the Sirhowy and Ebbw Valleys, and also southwards to Cardiff (Fig. 2).

TABLE 1: The first four British records of *Ceratosphys amoena* in chronological order.

Locality	Grid reference	Specimens	Date	Collector
Cefn Onn, South Glamorgan	ST177840	2 ♂♂ and 1 ?♀?	11.xi.1983	N. Nethercott
Coed Groes-faen	SO132010	1 immature	27.x.2011	CO
Aberbargoed grasslands	ST16249923	1 immature	3.xi.2011	CO
Groes-faen Wood	c. SO143007	1 adult ♂	28.ix.2014	MGT

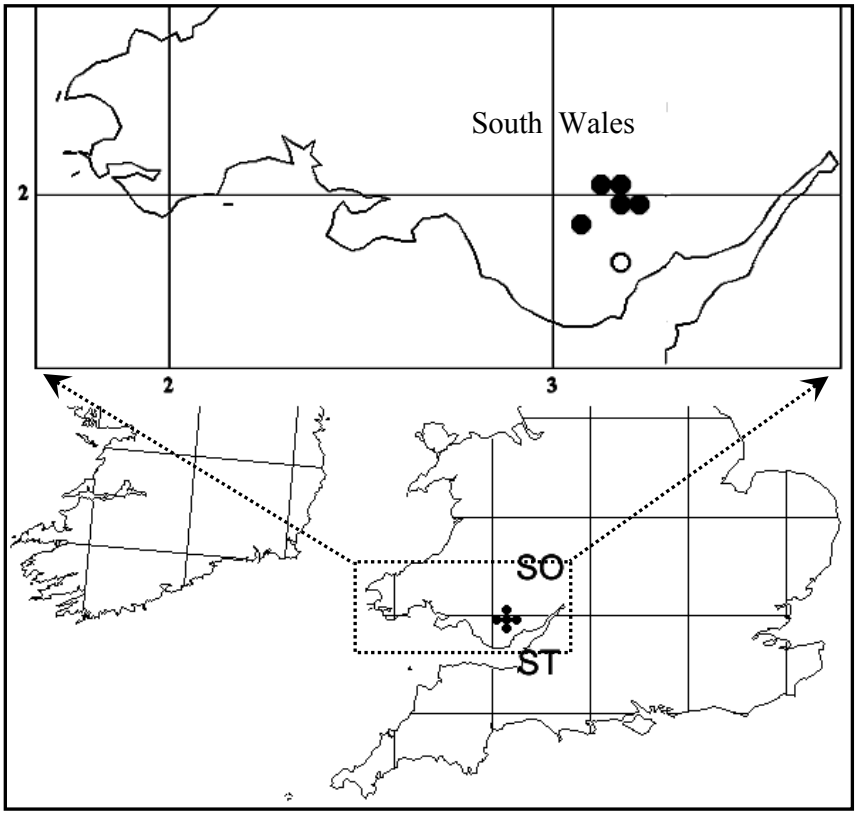


FIGURE 2: Known distribution of *Ceratosphys amoena* in Britain up to December 2014.
Main map plotted at 10km resolution, inset at 5km resolution. Solid dot (●) = post 2011 records, open circle (O) = record from 1983

FIGURE 3: ***Ceratosphys amoena***
Male specimen in dorsal view

FIGURE 4: ***Ceratosphys amoena***
Male specimen in lateral view

HYLEBAINOSOMA NONTRONENSIS MAURIÈS & KIME, 1999

Discovery

Small, whitish Chordeumatida millipedes were abundant in beech *Fagus* leaf-litter on 28th September 2014 in the same area of Groes-faen Wood, and indeed under the same log, where *C. amoena* was discovered. MGT sieved two or three handfuls of leaf-litter over a tray and collected 11 specimens of the 30 or more in the tray. They were tentatively identified as a *Melogona* species in the field but later examination revealed blunt paranota on the body rings, and also that all specimens were immature. All CO's and DJG's specimens were also immature.

CO returned to the wood on 5th October to collect further specimens of *C. amoena* (though still unidentified at that time). In the process, he easily found over 60 of the small, whitish Chordeumatida, and though still all immatures, he recognised that these were potentially another species new to Britain. He also recognised that they were conspecific with an adult female specimen in his collection from Bedwellty Church (c. SO166003, VC 35) collected on 23rd November 2011 and labelled as *Craspedosoma rawlinsii*.

By 9th October, CO had collected further adults from Bedwellty Church and from Groes-faen Wood and sent specimens to SJG who was able to confirm that these were of another species previously unrecorded from Britain. RDK first identified the species as *Hylebainosoma nontronensis* on 26th October from photographs and drawings by SJG. Subsequently, JS has confirmed that Welsh specimens match specimens of *H. nontronensis* from Brive-la-Gaillarde in the French Department of Corrèze.

Foreign distribution and habitats

Mauriès and Kime (1999) described *H. nontronensis* using specimens collected by RDK from three localities on the western edge of the Massif Central in the French Departments of Haute-Vienne and Dordogne. RDK has subsequently collected *H. nontronensis* from a further two localities in the same area, all from woods on neutral to acidic soils over metamorphic and igneous geology. In addition, JS has seen specimens collected by Axel Schönhofer from Brive-la-Gaillarde in the neighbouring French Department of Corrèze.

Identification

In Blower (1985), *H. nontronensis* will key to *Craspedosoma rawlinsii* due to its weakly developed paranota. However, it differs in its much smaller size (8 - 10 mm vs 15 - 16 mm), its longer body setae (shorter in *C. rawlinsii*), and its arrangement of ocelli (very acute triangle vs broad equilateral triangle). Mature male specimens can be readily identified due to the very distinctive profile of the gonopods in lateral view.

Description

This description is based on recently collected material, 3 males and 3 females, preserved in 70% isopropyl alcohol.

Adults with 30 body rings (pleurotergites), and therefore mature at stadium IX. Males have a body length of 8.5 - 9.0 mm and a body height of 0.85 - 0.90 mm (15th body ring). Females are slightly longer at 9.5 - 10.0 mm and with a body height of 0.90 - 0.95 mm.

Antennae 1.5 mm long in males, up to 1.6 mm in females. The eyes comprise between 13 and 14 ocelli forming a very acute triangle (Fig. 5A), typically arranged in horizontal rows of 1, 6, 4, and 2.

Body colour is a nondescript mottled pale brown, with paranota rather paler (Figs 8, 9). Body smooth, lacking obvious sculpture. Paranota weakly developed, little more than oval bumps, widest posteriorly (Fig. 5B).

Tergites each with three pairs of macrosetae, borne on the paranota (Fig. 5B). Angle formed by bases of the three macrosetae about 100° (15th body ring). Macrosetae are stout, elongated, and gently curved to a fine point. Their length exceeds the length of their associated metazonite.

Distance between bases of external (ex) and median (md) macrosetae slightly less than distance between bases of median and internal (in) macrosetae. The distance between medial suture (ms) and base of internal macroseta slightly more than double the distance between bases of median and internal macrosetae.

Male: leg pairs 1 to 7

In males, leg pairs 1 and 2 are reduced in size, while leg pairs 3 - 7 are more robust than other walking legs, or than those of female.

Male: body ring 7

Body ring 7 (which bears the gonopods and paragonopods) is noticeably swollen and clearly different from adjacent rings when viewed from above (Fig. 8).

Male: gonopods (leg pair 8)

Both gonopods (Figs. 5D, 5E) create a compact paired unit, with an unpaired median process (mp) lying in between.

In lateral view the gonopods are of highly characteristic shape (Fig. 5D). These are sometimes visible in un-dissected specimens but may be obscured by the bulbous paragonopods (leg pair 9). From a stout cylindrical base the gonopod divides towards the tip into three unequal branches (a, b, and c). The anterior branch (a) is much larger, and ends in a series of parallel slender processes. The two posterior branches (b and c) are slender and taper to curved points. On the interior side of the gonopod is a broad curved projection (d), bordered with fine spines, which is only visible from internal view.

There is a prominent spine (sp) located on the posterior, internal part of the gonopod. This feature is discussed further below under the heading "*A variable species?*".

The unpaired median process (mp) lies between the gonopods (Fig. 5D), rising to about half their height. Although laterally flattened, and slender in anterior or posterior view, in lateral view it is of a broad 'S' shape.

Gonopods also distinct in posterior (Fig. 5E) and anterior view, but the various gonopod branches (a, b and c) are less easy to discern.

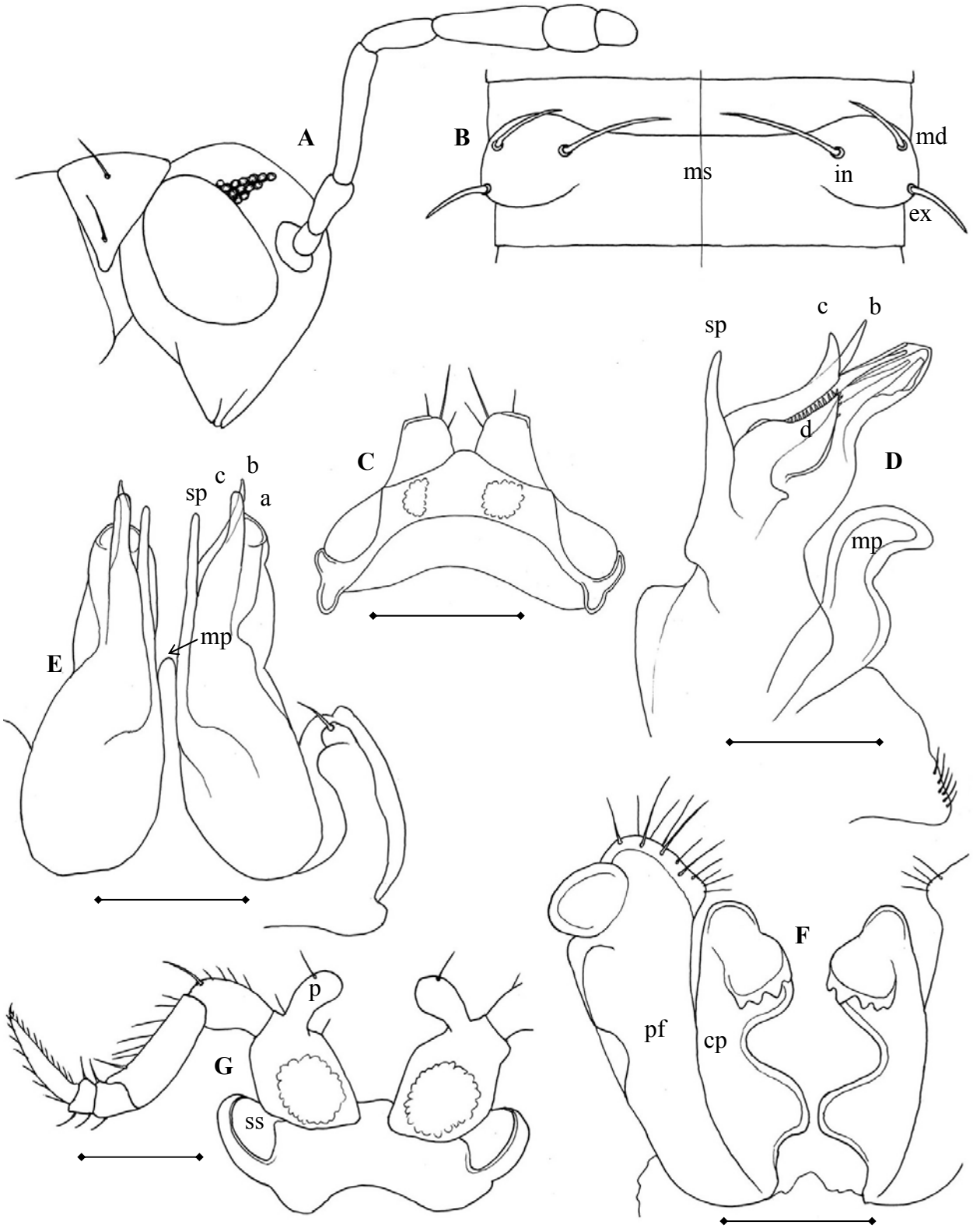


FIGURE 5: *Hylebainosoma nontronensis* from Groes-faen Wood.
A) Female, head and antenna, right lateral view. B) Female, body ring 15, dorsal view. C) Female, leg pair 3, posterior view. D) Male, right gonopod (leg 8) lateral internal view. E) Male, gonopods (leg pair 8), posterior view. F) Male, paragonopods (leg pair 9), posterior view. G) Male, leg pair 10, anterior view. All scale bars = 0.25 mm

Male: paragonopods (leg pair 9)

These are best seen in posterior view (Fig. 5F). Telopodite comprises mainly of prefemur (pf), which bears a fringe of stout setae along its apical margin. Other articles are greatly reduced to little more than a terminal tubercle. Coxa bears a conspicuous flattened medial coxal process (cp), which is almost as long as the telopodite. In posterior view these are of characteristic shape, with a sinuous inner margin, and towards their apex bear a ragged, coarsely toothed, basally oriented flange.

Male: leg pair 10

These are reduced relative to the following pairs of legs (Fig. 5G). Their enlarged coxae bear swollen sac-like processes (p), which are oriented medially to form a central channel between the legs. Each bears a large seta at its tip. The bases of the coxae are modified into ear-like structures, which link to sperm-sacs (ss).

Male: leg pair 11

Although reduced relative to the following leg pairs, they lack significant taxonomic features.

Female characters

In females the third pair of legs is considerably reduced (Fig. 5C), comprising essentially the basal article. This is rather square ended, and bears a few medial setae on the distal margin. All other leg pairs are normally developed. Female vulvae were not examined.

A variable species?

There is a prominent spine (sp) located on the posterior, internal, distal part of the gonopod of Welsh specimens (Figs 5D, 5E). This spine has also been observed on specimens from Brive-la-Gaillarde, France, examined by JS (Fig. 6 – arrowed). In this respect the Welsh and Brive-la-Gaillarde specimens differ significantly from the holotype illustrated by Mauriès and Kime (1999) in which the spine is apparently absent.

We recognise the need for further research on this subject. It is possible, though unlikely, that the spine was overlooked by Mauriès and Kime (1999). More likely in our view is that intra-specific variation exists for the presence or absence of this spine. Another possible explanation is that the specimens with the spine, recorded from Wales and Brive-la-Gaillarde, are an undescribed species closely allied to *H. nontronensis*.

The generic placement of *Hylebainosoma nontronensis* Mauriès & Kime, 1999

In their original description Mauriès & Kime (1999) tentatively placed *nontronensis,* from central France, within the Carpathian genus *Hylebainosoma* on the basis of the structure of the male genitalia. This generic placement was accepted as valid by Tajovsky *et al.* (2014) during their review of the genus. The question of the correct generic placement of *nontronensis* may not yet be finally resolved though; it may merit the erection of a new genus, though it also bears close similarities to genus *Xylophageuma*, occurring in parts of the Black Forest, Germany, the French and Swiss Jura and some other parts of eastern France.

FIGURE 6: *Hylebainosoma nontronensis* from Brive-la-Gaillarde, France.
Gonopods in posterior view. Photograph by JS.

British records

The earliest British record thus far known is from Bedwellty Church, collected by CO on 23rd November 2011. Like the 1983 and 2011 records of *Ceratosphys amoena*, this too was originally misidentified as *Craspedosoma rawlinsii*. No other British records are currently known until the series of records starting on 28th September 2014 (Table 2).

TABLE 2: The first four British records of *Hylebainosoma nontronensis* in chronological order.

Locality	Grid reference	Specimens	Date	Collector(s)
Bedwellty Church	c. SO166003	1 adult ♀	23.xi.2011	CO
Groes-faen Wood	c. SO143007	numerous immatures	28.ix.2014	CO, DJG, MGT
Groes-faen Wood	c. SO143007	over 60 immatures	5.x.2014	CO
Bedwellty Church	c. SO166003	3 adult ♂♂ and 1 ♀	6.x.2014	CO

Subsequent fieldwork by CO has found *H. nontronensis* to be fairly common in the Welsh Valleys though slightly less frequent than *C. amoena*. It occurs in a range of habitats including an unkempt cemetery, Heather and Whinberry heathland (from thick moss at the base of Heather), Bracken heathland, hedgerows and woodland (including wet woodland). It has been found by searching leaf-litter, turning over logs and by torchlight searching for active individuals. *H. nontronensis* has been recorded quite widely in the Rhymney, Sirhowy and Ebbw Valleys, often in company with *C. amoena* but has not been found elsewhere and so is currently less widespread than *C. amoena* (Fig. 7).

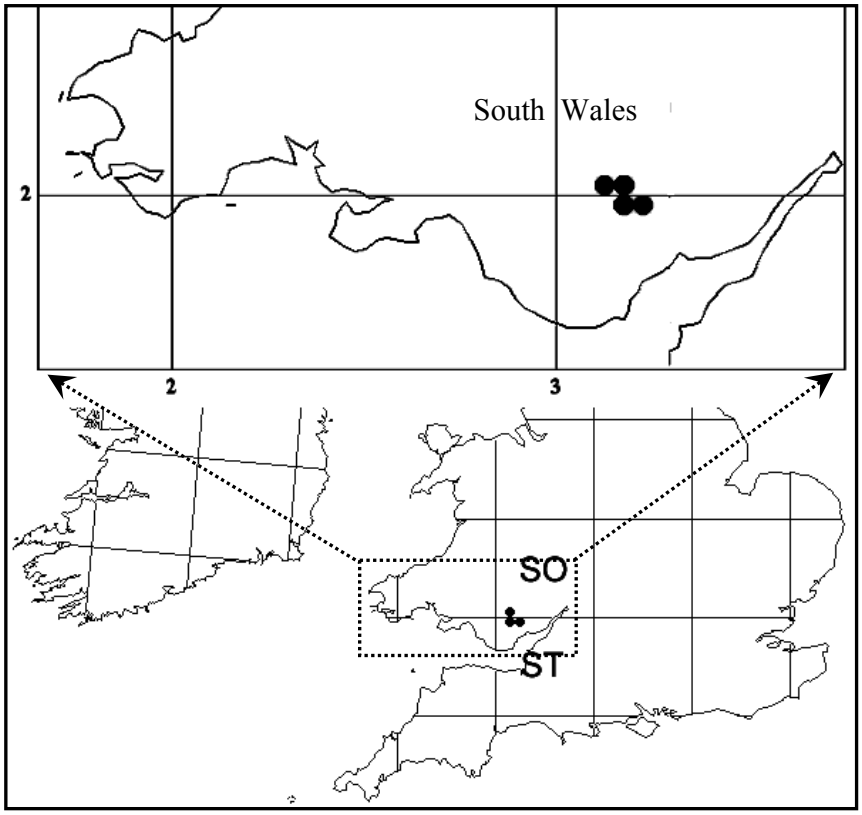


Figure 7: Known distribution of *Hylebainosoma nontronensis* in Britain up to December 2014.
Main map plotted at 10km resolution, inset at 5km resolution. Solid dot (●) = post 2011 records.

Natives or aliens?

Two alternative hypotheses may be proposed: (i) these millipedes are native to Britain, in relict populations restricted to a small area of Wales where they were overlooked or misidentified until their discovery at Groes-faen Wood, or (ii) these millipedes have been introduced to Britain, beyond their natural range, probably in recent years, and have become established in a small area of Wales.

To confidently discriminate between these two hypotheses on current evidence is very difficult. However, we consider that the balance of evidence currently favours the hypothesis of overlooked natives. Firstly, both species are of western European distribution, unlike, for example, *Selenochlamys ysbryda* which is an alien of Crimean origin. Secondly, both species have been previously misidentified on at least one occasion in Britain as *C. rawlinsii*. Thirdly, *C. amoena* has been established in Glamorganshire since at least 1983, and *H. nontronensis* in Monmouthshire since at least 2011. Fourthly, the disjunct northern population of *C. amoena* in Belgium is regarded as native, occurring in a glacial refugium.

Alien species in Britain are usually discovered in the vicinity of ports and major population centres, and the earliest known record of *C. amoena* at Cefn Onn comes from just such a locality. However, Bedwellty Church, the earliest locality for *H. nontronensis*, is relatively remote from any obvious routes of importation, though the Bargoed area does support a number of undoubtedly alien species.

If our native hypothesis is correct, we predict that there is a chance that another member of the Chordeumatida with a similar distribution pattern, *Pyrgocyphosoma arvernum* Brolemann & Ribaut, 1932, may also be discovered in South Wales. This species currently shows a very disjunct distribution with records from the Massif Central as well as from the Pyrenees, although belonging to

a genus having its centre of diversity in Italy (Spelda, 2008). We further predict that examination of specimens of *C. rawlinsii* in museum and private collections will reveal further previously misidentified specimens of *C. amoena* and *H. nontronensis*, and from much earlier dates.

If our hypothesis is incorrect, we predict that any misidentified museum specimens that are found will all be quite recent, and that both species will expand to colonise a much wider area of southern and western Britain, as *Selenochlamys ysbryda* is currently doing. SJG has recently examined the *C. rawlinsii* specimens in the BMIG collections at Dinton Pastures and found all to be correctly identified.

FIGURE 8: ***Hylebainosoma nontronensis***
Male specimen in dorsal view

FIGURE 9: ***Hylebainosoma nontronensis***
Male specimen in lateral view

Rowson *et al.* (2014) added several slugs to the British list including two from South Wales which are otherwise known from the Pyrenees (*Arion* (*Mesarion*) *cf. iratii* Garrido, Castillejo & Iglesias, 1995 and *Arion* (*Kobeltia*) *cf. fagophilus* (de Winter, 1986)). Though regarded as probable introductions, they could be overlooked native species. The harvestman *Sabacon viscayanum* has a similar distribution, restricted in Britain to South Wales, the Wyre Forest and Devon and here represented by subspecies *ramblaianum* Martens, 1983 described from the French Department of Basses-Pyrénées. It has been assumed to be a native species in Britain. There has been trade and human migration amongst people on the Atlantic coast of Europe in ancient and modern times, including, for example, imports of iron ore from the Basque Country to the industrial Welsh Valleys (Ben Rowson, *in litt.*, March 2015), so there is at least a plausible pathway for introductions from the Pyrenees to South Wales. We are not aware of equivalent trade links between South Wales and the French range of *H. nontronensis*.

Genetic analysis of Welsh material of both species has been undertaken by sequencing the classical barcode fragment, the mitochondrial cytochrome c oxidase subunit 1 (CO1), following the methodology described by Spelda *et al.* (2011). Four specimens of each species were examined and barcodes of full length (658 base-pairs) were obtained from each. The sequences generated can be accessed in the Barcode of Life Data Systems (BOLD; Ratnasingham & Hebert 2007, http://www.boldsystems.org) under the BOLD Process IDs GBMYR290-15, GBMYR291-15, GBMYR292-15 and GBMYR434-15 for *H. nontronensis* and GBMYR435-15, GBMYR436-15, GBMYR437-15 and GBMYR438-15 for *C. amoena*. This will enable future comparison with continental populations of both species, once fresh material of each becomes available. We found very little variation in *H. nontronensis*, while the *C. amoena* specimen GBMY435-15 showed a remarkable distance of about 1% from the other samples. So for at least this latter species we have a hint that it may be a native rather than an alien. This may provide evidence with which accurately to discriminate between the native and alien hypotheses. International genetic studies on other "Atlantic invertebrates" would help to answer the tantalizing question of whether such invertebrates survived in a glacial refugium in or near South Wales.

ACKNOWLEDGEMENTS

We would like to thank the following: Paul Lee for discussion of the native status of these species; Axel Schönhofer for material of *Hylebainosoma* from France; Claudia Pätzold and Jerome Moriniere for help with the genetic analysis; Peter Nicholson for information on *Sabacon*; Ben Rowson of the National Museum of Wales, Cardiff, for discussion of the native and alien hypotheses; Darren Mann, James Hogan and colleagues at the Hope Department of Entomology, Oxford University Museum of Natural History, for the use of their digital auto-montage equipment, with which the habitus images were taken.

REFERENCES

Blower, J.G. (1985) *Millipedes*. Linnean Society Synopses of the British Fauna (New Series) No. **35**. Leiden: Brill / Backhuys.

Demange, J.-M. (1981) *Les mille-pattes (Myriapodes): généralités, morphologie, ecologie, ethologie determination des espèces de France*. Paris: Editions N. Boubée

Mauriès, J.-P. (1978) Myriapodes - Diplopodes du sud de l'Espagne. *Annalen des Naturhistorischen Museums in Wien*, **81**: 575 - 588.

Mauriès, J.-P. & Kime, R. D. (1999) Description, écologie et chorologie de trois espèces nouvelles de diplopodes (Myriapoda, Diplopoda) des zones périphériques du Massif central et du centre de la France. *Zoosystema*, **21**: 367 - 378.

Ratnasingham S. & Hebert P. D. N. (2007) BOLD: The Barcode of Life Data System (http://www.barcodinglife.org). *Molecular Ecology Notes* **7(3)**: 355–364. doi: 10.1111/j.1471-8286.2006.01678.x

Ribaut, H. (1920) Notes sur les Chordeumoides de France. *Bulletin de la Société d'Histoire Naturelle de Toulouse*, **48**: 18 - 34.

Ribaut, H. (1955) *Ceratosphys amoena* Rib. et *C. confusa* n. sp. [Diplopoda - Craspedosomidae]. *Bulletin de la Société d'Histoire Naturelle de Toulouse*, **90**: 301 - 302.

Ribaut, H. (1956) Craspedosomides nouveaux des Pyrénées. III. [Myriapoda Diplopoda]. *Bulletin de la Société d'Histoire Naturelle de Toulouse*, **91**: 93 - 97.

Rowson, B., Anderson, R., Turner, J. & Symondson, B. (2014). The slugs of Britain and Ireland: undetected and undescribed species increase a well-studied, economically important fauna by more than 20%. *PLoS ONE*, **9(3)**: e91907. doi: 10.1371/journal.pone.0091907

Spelda, J. (1999) *Verbreitungsmuster und Taxonomie der Chilopoda und Diplopoda Südwestdeutschlands. Diskriminanzanalytische Verfahren zur Trennung von Arten und Unterarten am Beispiel der Gattung Rhymogona Cook, 1896 (Diplopoda: Chordeumatida: Craspedosomatidae).* Teil 1. Thesis, University of Ulm: 217 pp.

Spelda, J. (2008) The genus *Pyrgocyphosoma* Verhoeff, 1910 (Diplopoda: Chordeumatida: Craspedosomatidae): New aspects on systematics, distribution and ecology. *Schubartiana*, **3**: 5 - 47.

Spelda J., Reip H. S., Oliveira Biener U., & Melzer R. R. (2011). Barcoding Fauna Bavarica: Myriapoda – a contribution to DNA sequence-based identifications of centipedes and millipedes (Chilopoda, Diplopoda). *ZooKeys* **115**: 123–139. doi: 10.3897/zookeys.156.2176.

Tajovsky, K., Mock, A. & Papáč, V. (2014) The genus *Hylebainosoma* Verhoeff, 1899 (Diplopoda, Chordeumatida, Haaseidae): Redescription of *Hylebainosoma tatranum*, description of a new troglobiont species and notes to the *Hylebainosoma–Romanosoma* species group. *Zootaxa*, **3764**: 501 - 523.

Telfer, M.G. (2014a) Into the Valley of the Millipedes, part 1. http://markgtelfer.co.uk/2014/11/12/into-the-valley-of-the-millipedes-part-1/

Telfer, M.G. (2014b) Into the Valley of the Millipedes, part 2. http://markgtelfer.co.uk/2014/11/12/into-the-valley-of-the-millipedes-part-2/

ANAMASTIGONA PULCHELLA (SILVESTRI, 1894) – FIRST BRITISH RECORDS FOR ENGLAND, SCOTLAND AND WALES (CHORDEUMATIDA: ANTHROLEUCOSOMATIDAE)

Steve J. Gregory[1], Michael B. Davidson[2], Christian Owen[3] & Roy Anderson[4]

[1] 200 Ock Street, Abingdon, Oxfordshire, OX14 5DR, UK.
E-mail: stevejgregory@btopenworld.com

[2] E-mail: mike.davidson55@btinternet.com

[3] E-mail: christian.owen49@yahoo.com

[4] 1 Belvoirview Park, Belfast BT8 7BL, N. Ireland, UK.
E-mail: roy.anderson@ntlworld.com

INTRODUCTION

The genus *Anamastigona* comprises about 19 known species with a Mediterranean distribution mainly centred on Italy and Greece (Golovatch & Markov, 2011). Of these only *Anamastigona pulchella* (Silvestri, 1894), originally native to southern and central Italy, appears to have spread further afield. Its known distribution includes Southern France, Portugal and Madeira, and further north in central Germany and Northern Ireland.

The discovery of *A. pulchella* at four sites in Co. Down, Northern Ireland was reported by Anderson (1996). Subsequently, it has been found in a total of 19 sites within Northern Ireland, where it has proved to be well naturalised (RA, unpublished data). Although Anderson (1996) suggested it may be expected to spread to other parts of Ireland and western Britain, no additional localities outside of eastern Northern Ireland have been reported subsequently (Lee, 2006).

This paper reports the first occurrences of this species in England, Scotland and Wales. Known sites are detailed below.

FIRST RECORDS FOR ENGLAND

RHS Garden Wisley

In October 2011 SJG was sent some millipede specimens for confirmation that had been collected from Royal Horticultural Society's (RHS) Garden Wisley near Woking, Surrey (TQ06-59-, VC 17) by Dr. Sarah Al-Beidh as part of the RHS Plants for Bugs project. Among pitfall trap samples collected in August 2011 were two small immature stadia of a Craspedosomatidea millipede, both lacking their posterior segments. These had been provisionally labelled as *Craspedosoma rawlinsii* Leach, but seemed too small to be that species. Subsequent samples collected in December 2011 contained a mature male specimen and two females. At 9-10 mm in length these adults were too large to be *Anthogona britannica* Gregory, Jones & Mauriès, but too small to be *C. rawlinsii*. Examination of the male specimen revealed that the gonopods, paragonopods and the distinctive coxae of the 10th pair of legs matched those figured by Anderson (1996) of *Anamastigona pulchella* (Gregory, 2012). In 2012 and 2013 additional specimens, including mature males and females, were collected from pitfall traps and forwarded to SJG for examination. Table 1 indicates the numbers, and life stages, found in pitfall traps each month.

TABLE 1: RHS Garden Wisley; Number of individuals of *Anamastigona pulchella* collected in pitfall traps each month from 2011 to 2013

♂= Male, ♀= Female, vii/viii = stadia VII/VIII, x = no samples

Sample Site	Year	Month of sample collection							
		Aug	Sept	Oct	Nov	Dec	Jan	Feb	Apr
Howard's Field	2011	2vii	x		x	1♂ 2♀♀	3viii		
Deers Farm	2012	1vii	x		x	1♂		1♀	
Howard's Field	2012	1vii	x	1viii	x	2♂ 5♀♀			
Deers Farm	2013		x		x				1♀
Howard's Field	2013		x		x			1♀	1♀

Adult stadia IX, with 30 body rings, were recorded in December, February and April samples. Within the limited sample of 14 adults the percentage of males present was 40%. Males were 9-10 mm in length; 0.8-1.0 mm in height (ring 15 measured). In males the seventh pair of legs are particularly robust, noticeably larger than the proceeding leg pairs. In live animals (observed at Oxford and Glasgow) this leg pair is not used for walking, but held projecting sideways (Fig. 2). Females were slightly larger at 9.5-11 mm in length; 1.0-1.1 mm in height. In both sexes eyes comprise 15 to 17 well pigmented ocelli arranged in an acute triangular field (Fig. 1).

The most striking features of adult specimens were the extremely stout body setae and the very long legs (up to twice body width). Both features were very conspicuous in the coiled preserved specimens. However, care with identification needs to be taken in light of the discovery of the superficially similar *Hylebainosoma nontronensis* Mauriès & Kime in south Wales (Telfer, *et al*, in this Bulletin **28**:15-30). A more complete description of *A. pulchella*, including figures of male sexual characters, is given by Anderson (1996).

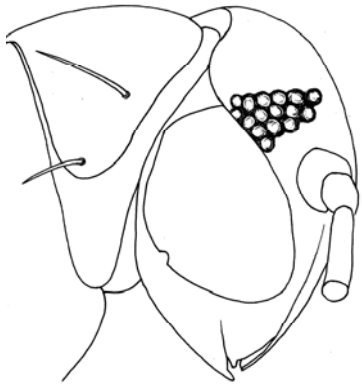


FIGURE 1: *Anamastigona pulchella* (Silvestri). Female specimen from RHS Garden Wisley, from pitfall trap dated 06.x.2012. Head, showing ocular field, lateral view (setae omitted).

Subadult stadia VIII with 28 body rings and between 7-8 mm in length. Ocelli indistinct, but about 12 in number. These were collected in October and January samples. Stadia VII with 26 body rings and 5 mm in length (one undamaged specimen) were recorded in August samples. Ocelli very indistinct, but about 8 or 9 in number.

Oxford

In summer 2013 SJG collected two mature females (30 body rings) of a conspicuously 'long-legged' Craspedosomatidea millipede while undertaking a survey of the invertebrate fauna at Trap Grounds, Oxford (SP502081, VC 23). The specimens were found in a pitfall trap set between 4-19th June 2013 in secondary woodland that has developed over rubble dominated soil derived from flattened spoil heaps. Although the trapping area is relatively dry, it lies adjacent to several wetland areas dominated by sedges *Carex* sp.

Both specimens were 11 mm in length, 1.1 mm in height (body ring 15) and with eyes comprising 16 to 17 ocelli. Direct comparison with female specimens collected from RHS Garden Wisley indicated that these were also examples of *A. pulchella.* They were associated with the millipedes *Brachyiulus pusillus* (Leach) (male examined), *Ophyiulus pilosus* (Newport) and *Polydesmus coriaceus*.

On 5th November 2015 many live specimens of *A. pulchella* were seen at Trap Grounds, beneath dead wood and among leaf litter, especially in low-lying damp areas. The sample collected included two male specimens.

Trap Grounds is one of the last remaining un-built spaces along the Oxford Canal between the city centre and the northern suburbs. It supports a rich mosaic of habitats, including reed bed, grassland and mature deciduous secondary woodland. Until the 1990s it was used as an unofficial rubbish tip and today is surrounded by housing on three sides. The flora includes many introduced 'garden escapes', but the invertebrate fauna includes several species of county or regional importance.

FIRST RECORDS FOR SCOTLAND

Glasgow

In November 2012, while conducting an invertebrate survey of a Glasgow city centre graveyard known as Glasgow Necropolis (NS606654, VC 77), MBD collected one adult female specimen of an unfamiliar Craspedosomatidea millipede. The specimen was found while hand searching in leaf litter below trees at the perimeter of an area of in-filled ground known as the Coup. Further adult specimens (stadium IX) were found in pitfall traps set on the Coup during October/November 2012 and the presence of males allowed confirmation of the first recorded occurrence of *Anamastigona pulchella* in Scotland (Davidson, 2013). The pitfalls were set in an area of moss, grass and tall herbs that has developed on top of an infill of rubble/rock, miscellaneous waste materials and some soil. A nearby area of steep rough grassland (the Slope) also produced *A. pulchella* from pitfall traps.

FIGURE 2: *Anamastigona pulchella* (Silvestri). Male specimen from Glasgow Necropolis. Note the particularly robust 7th leg, which is not used for walking. (image © Mike Davidson 2013)

TABLE 2: Glasgow Necropolis; Number of individuals of *Anamastigona pulchella* from pitfall traps and hand collection.

♂=male; ♀=female; vi/vii/viii = Stadia VI/VII/VIII, x = no sampling undertaken

Year & method	Month of sample collection											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012 pitfalls	x	x	x	x	x	x	x	x	x	27♂; 10♀		
2012 pitfalls	x	x	x	x	x	x	x	x	x		21♂; 9♀	
2012 by hand											1♀	
2013 pitfalls	x	x	x	2♀		5vi 5vii			1♂; 13viii; 1 vi		6♂	
2013 pitfalls	x	x	x		5♀		1 vii			23♂; 1♀; 1vii;1vi		
2013 by hand				1♀					1vii		2♂ 3♀	
2015 by hand		1♂ 2♀										

Table 2 shows the periods when *A. pulchella* was found, either in pitfall material or by hand collecting, and also indicates the life stage of the specimens which were collected. The numbers combine material from both sites (Coup and Slope). The pitfall traps were operated from October 2012 to December 2012 and again from April 2013 to November 2013.

By combining the pitfall trapping program and samples from hand collecting we can make some observations on the life history of *A. pulchella* in Glasgow. It seems that adult females are present from October until at least April, while adult males were first recorded in September and persist until at least February. The earliest stadia collected were VI/VII in June-August although small numbers of these stages were found in the autumn along with VIII and adults (IX).

As observed by Anderson (1996) the more active males are generally more abundant in the pitfall traps than the females.

A small number of adults (from pitfall and hand collecting) were measured giving the following approximate size ranges allowing for distortion: Males 9.5-10.5 x 0.8-0.9 mm. General habitus shown in Fig. 2. Females 10.5-11.5 x 1.0 mm. These are similar to the sizes given by Anderson (1996) for material from Northern Ireland and the English specimens. The number of ocelli in adult stadium IX varied from 15-18.

Observations from hand collecting indicated that the species was present in large numbers in and below the moss on the Coup. Also on the edge of this area were some spoil heaps of a clay soil/hard core type material. In February 2015 adult *A. pulchella* were easily found by digging amongst this aggregate and seemed to be living in the voids.

Other millipede species found along with *A. pulchella* at the Coup and Slope include *Melogona scutellare* (Ribaut), *Melogona voigti* (Verhoeff), *Allajulus nitidus* (Verhoeff), *Cylindroiulus*

britannicus (Verhoeff), *Brachydesmus superus* Latzel, *Choneiulus palmatus* (Nimec), *Archiboreoiulus pallidus* (Brade-Birks), *Brachyiulus pusillus* and *Ophyiulus pilosus*.

Glasgow Necropolis was established in the 1830s around a disused quarry. It has the usual array of ornamental trees and shrubs and extensive areas of mown grass, but of more interest are some of the less manicured steep slopes, the disused quarry face and the coup. It is not known where the waste material dumped in the coup originated but, as well as from the Necropolis, it is likely to have come from across the city including other cemeteries, parks and gardens. As there are good transport links between SW Scotland and N. Ireland it seems possible that transfer between the two areas has taken place either via waste transfer or the horticulture trade. It is well worth exploring more sites in SW Scotland for *Anamastigona pulchella*.

FIRST RECORDS FOR WALES

Cardiff

On 7th January 2013 RA discovered a single female specimen of *A. pulchella* in Bute Park, Cardiff (ST171774, VC 41) while searching for slugs. It was found among Sycamore *Acer pseudoplatanus* leaf-litter under stones in deciduous woodland on the banks of the River Taff. The woodland is patchy with open and/or bare areas where people walk their dogs and some disturbance, turning of stones, etc., was seen. General features of the site (deep wet leaf litter in proximity to water) nevertheless accord with observations in Ireland. Four additional specimens, associated with *Propolydesmus testaceus* (C.L.Koch, 1847), were found by CO and Ben Rowson on 27th October 2014. These specimens have been retained in the Cardiff Museum's collection.

At 56 hectares, Bute Park is one of the largest urban parks in Wales and comprises a broad mix of urban woodland, playing fields, an arboretum and other horticultural features along the River Taff corridor.

Abergavenny

On 15th November 2014 CO collected a male and female specimen of *A. pulchella* from Abergavenny (SO305141, VC 35) while searching for additional sites for the millipedes *Hylebainosoma nontronensis* Mauriès & Kime and *Ceratosphys amoena* Ribaut, both recently recorded in Britain (Telfer, *et al*, in this Bulletin **28**:15-30). The two specimens of *A. pulchella* were readily sieved from deep leaf litter beside a wall bordering a green lane lined with mature trees, including Beech *Fagus sylvatica*, Horse Chestnut *Aesculus hippocastanum* and Oak *Quercus*, adjacent to domestic gardens. A subsequent visit to site on 29th November 2014 produced two more specimens, but this time the species was much more difficult to find. These latter two specimens were preserved in absolute alcohol for genetic barcoding.

DISCUSSION

In Northern Ireland *A. pulchella* seems to do best in old woodlands, especially those on National Trust properties where there have been plenty of opportunities for unintentional introduction. Here it favours deep, stable leaf litter containing dead wood and larger fleshy fungi in shaded damp places. The emphasis is on damp localities. Some of the records relate to water-logged alder carr on lakeshores or on river banks. There is a single record for a garden centre and it is possible that this species may get moved to new sites with plant pots, etc. So far in Northern Ireland it has not been seen in domestic gardens.

This is in keeping with British observations where *A. pulchella* has been found associated with mature trees or deciduous woodland, especially in areas with deep accumulations of leaf litter. All British sites are heavily synanthropic and, with the exception of RHS Wisley Garden, all are less intensively managed 'wild' areas within towns or cities. The Oxford and Glasgow sites were both former rubbish tips where waste material (including garden rubbish) is likely to have been imported from elsewhere (a possible source of introduction). The Oxford and Abergavenny sites lie adjacent to domestic gardens. Plant material (another possible source of introduction) has been widely introduced to RHS Garden Wisley and to Bute Park.

The idea that *A. pulchella* is introduced into Britain and Ireland is supported by genetic analysis of a specimen from Abergavenny, south Wales (accessible via iBOL (www.boldsystems.org) under the BOLD process ID GBMYR432-15). The classical barcode fragment, mitochondrial cytochrome c oxidase subunit 1 (CO1), comprising the full length of 658 base-pairs, proved to be identical with a specimen of *A. pulchella* from Lago di Como, northern Italy (within its native range) and with two specimens from Saxony-Anhalt, Germany (where it is believed introduced) (J. Spelda, pers. comm.).

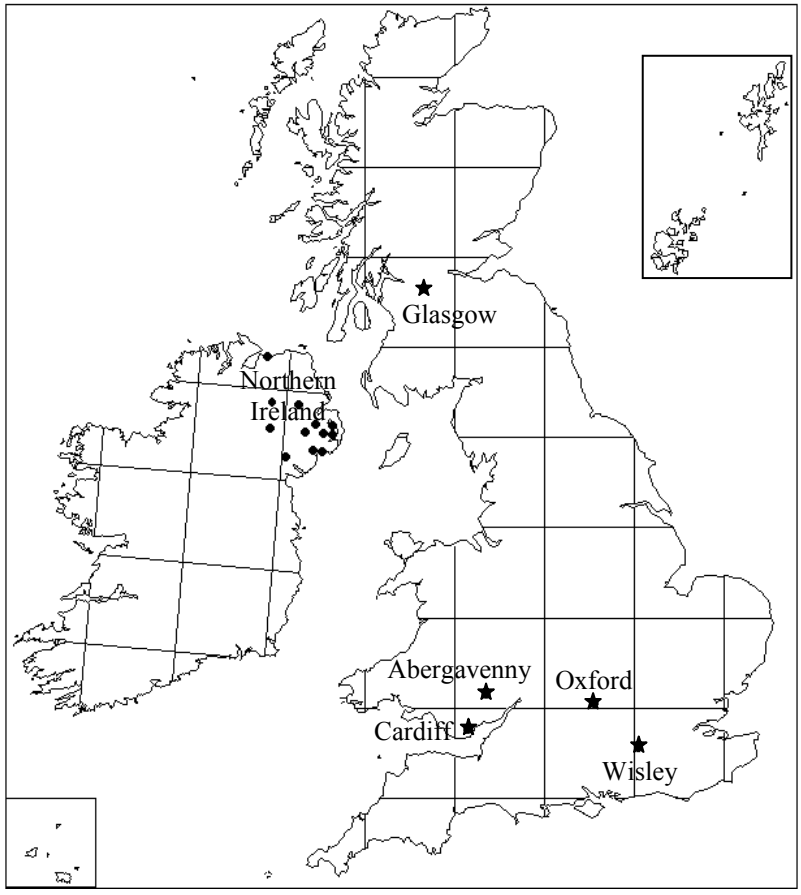


FIGURE 3: Known distribution of *Anamastigona pulchella* Silvestri in Britain and Ireland.
All known records up to April 2015 are plotted at 10km resolution.
★ = First British records reported herein.

In common with other Chordeumatida millipedes *A. pulchella* is mature in the winter months. At RHS Garden Wisley immatures were first trapped in August (probably July/August in Glasgow) with sub-adults appearing in October. Adults were recorded at least by October (Glasgow), through November (Glasgow, Abergavenny), December (RHS Garden Wisley, Glasgow), January (Cardiff), February to April (RHS Garden Wisley, Glasgow). The presence of mature females in June (Oxford)

suggest this gender may persist into the summer. This is in keeping with observations in Northern Ireland (Anderson, 1996), where immature stadia were observed in late-summer/early autumn, with adults appearing in early October until February. At RHS Garden Wisley three immatures were also recorded in January. An overlap of generations was also noted by Anderson (1996) who recorded an early instar in late February. This may indicate a longer than annual lifecycle.

The widely scattered locations of *A. pulchella* across England, Scotland and Wales (Fig. 3) may indicate a number of recent accidental introductions, possibly via the horticultural trade. In Oxfordshire extensive surveys of Diplopoda were undertaken during the 1990s (Gregory & Campbell, 1996), including pitfall trapping in several major towns, including Oxford. The occurrence of *A. pulchella* (or indeed any other species of Craspedosomatidea millipede) was not reported then, which supports the idea that it may be a recent arrival in Oxfordshire.

Observations in Northern Ireland indicate that the species continues to spread across the eastern counties, but its dispersal has been very slow. So far it remains unrecorded in western counties or in the Republic of Ireland. The recent cold or very cold winters in Northern Ireland do not appear to have affected populations adversely. This is supported by its discovery in Glasgow, which may experience even colder winters. The good transport links between Northern Ireland and Scotland may have provided a route for translocation between the two countries. It is expected that *A. pulchella* will be found at other sites in Britain and it will be interesting to see if *A. pulchella* spreads to other areas.

ACKNOWLEDGEMENTS

SJG is grateful to Dr. Sarah Al-Beidh for providing specimens of *A. pulchella* from RHS Wisley Gardens for examination. Surveys at Traps Grounds, Oxford, were undertaken by SJG with the help of a small grant from the Friends of Trap Grounds. MBD undertook surveys at Glasgow Metropolis with the help of a small grant from the Glasgow Natural History Society (GNHS). It is hoped that the survey results will be published in the *Glasgow Naturalist*. The distribution map was plotted using the DMapW mapping programme developed by Alan J. Morton.

REFERENCES

Anderson, R. (1996) *Anamastigona pulchellum* (Silvestri) an addition to the fauna of northern Europe, recorded from Ireland. *Bulletin of the British Myriapod Group*, **12**: 7-11.

Davidson, M. (2013) Recent millipede finds at Glasgow Necropolis. *British Myriapod & Isopod Group Newsletter*, **27**: 3 (unpublished).

Golovatch, S.I. & Markov, S.E. (2011) Two new, easternmost species of the millipede genus *Anamastigona* Silvestri, 1898 from Israel and Caucasus (Diplopoda: Chordeumatida: Anthroleucosomatidae. *Arthropoda Selecta* **20(1):** 11-20.

Gregory, S. (2013) Possible *Anamastigona pulchella* from Oxford City. *British Myriapod & Isopod Group Newsletter*, **27**: 3 (unpublished).

Gregory, S. (2012) *Anamastigona pulchella* (Silvestri) - a millipede new to Britain. *British Myriapod & Isopod Group Newsletter*, **24**: 2 (unpublished).

Gregory S.J. & Campbell J.M. (1996). *An Atlas of Oxfordshire Myriapoda: Diplopoda (Millipedes) & Chilopoda (Centipedes)*. Occasional Paper No. 19. Oxfordshire County Council.

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

THE ESTABLISHMENT OF AN ITALIAN FLAT-BACK MILLIPEDE, *POLYDESMUS ASTHENESTATUS* POCOCK, 1894 (DIPLOPODA: POLYDESMIDAE) IN IRELAND

Roy Anderson

1 Belvoirview Park, Belfast BT8 7BL, N. Ireland, UK.
E-mail: roy.anderson@ntlworld.com

ABSTRACT

Well established colonies of *Polydesmus asthenestatus* are reported from nine sites in north-east Ireland and one in Co Wicklow south of Dublin. This species is native to the provinces of Umbria, Toscana and Roma in Italy and to Corsica. It favours wet riverine woodland and is a winter species, being active from September through to May. It shows a small degree of synanthropic behaviour and can be bred in captivity. The colonisation of disturbed habitats and gardens is considered likely which may lead to further range expansion in Ireland.

INTRODUCTION

The Italian peninsula is well known as a centre of polydesmid diversity (Minelli *et al.,* 1995). A total of 49 species of flat-backed millipedes (Polydesmidae) are listed, many of which are endemic. In comparison, the polydesmid fauna of the British Isles is impoverished, with just seven species. Five are known from Ireland: *Polydesmus angustus* Latzel, *P. coriaceus* Porat, *P. denticulatus* C. L. Koch, *P. inconstans* Latzel and *Brachydesmus superus* Latzel (Lee, 2007). The polydesmid fauna of countries on the northern fringes of mainland Europe is similar and neither Holland nor Denmark list any additional species. Six non-British species recorded for Germany, are confined to the far south. The reasons why so few *Polydesmus* have been able to colonise northern latitudes in Europe from southern refugia following the last glaciation, are unclear. By comparison, anthropochorous spread of other millipede families across Europe has gone ahead relatively unimpeded. This suggests that there may be some climatic impediment, though this is not supported by the present discovery.

Two species of millipede native to Italy are currently known in Ireland. The paradoxosomatid *Stosatea italica* (Latzel), is known from southern counties and the chordeumatid *Anamastigona pulchella* (Silvestri), was discovered on National Trust properties in north-east Ireland in the nineteen-nineties (Anderson, 1996). *Stosatea* is well known in Britain, and possibly an ancient introduction, but until very recently (Gregory, *et al.* in this Bulletin **28**:31-37) *Anamastigona* had not been recorded there.

It was as a result of a quiet afternoon's ramble at Minnowburn Beeches, a National Trust property in south Belfast, that I came across a new *Polydesmus*. Large numbers of millipedes of what at first appeared to be a species of *Brachydesmus*, because of their flat-backs, small size, relatively glossy upper surface and narrow profile (pronounced in juvenile instars), were found resting on the undersides of almost every branch picked up in a glade under beech. It was quickly apparent that these did not belong to any of the accepted British species of either *Brachydesmus* or *Polydesmus* (Blower, 1985). Demange (1981) was consulted and a provisional match found with *Polydesmus asthenestatus* Pocock, 1894. This was corroborated after consulting Attems (1926) and Verhoeff (1941). Material was then sent to Per Djursvoll, University of Bergen, who kindly confirmed the provisional diagnosis.

Polydesmus asthenestatus asthenestatus is a native of north central Italy, from Toscana to Neapoli (more or less the same area as that occupied by *Anamastigona pulchella* but excluding some areas south of Neapoli). *Polydesmus asthenestatus* and *Anamastigona pulchella* have therefore somehow found their way from Italy to Ireland, apparently missing out all of the countries in between. Transport together with horticultural goods from a distribution centre or centres in north Italy seems the most likely mechanism for this, but the exact source is unknown.

DESCRIPTION

A small species, length ranging in males from 7.9 to 10.3 mm (average 9.1 mm), in females from 8.1 to 11.8 mm (average 9.5 mm). Width measured across the median tergites for males averaged 1.0 mm, for females 1.3 mm. These measurements were from a sample of 54 specimens collected at the Belvoir Forest locality in January 2015. Within the sample the percentage of males present was 11.1 % i.e. one in nine.

Colour is variable, ranging from a relatively translucent greyish to a deeper grey-brown, becoming darker as development proceeds (Fig. 1A). Surface of the tergites is distinctly glossy. General habitus is strongly reminiscent of *Brachydesmus superus,* since tergite widths are relatively narrow compared to the length of the animal, and dorsal surfaces are glossy. Breadth in relation to length was 0.11 for males and 0.13 for females in the Belvoir sample (contracted, in alcohol) which is within the range for *Brachydesmus superus* quoted by Blower (1985).

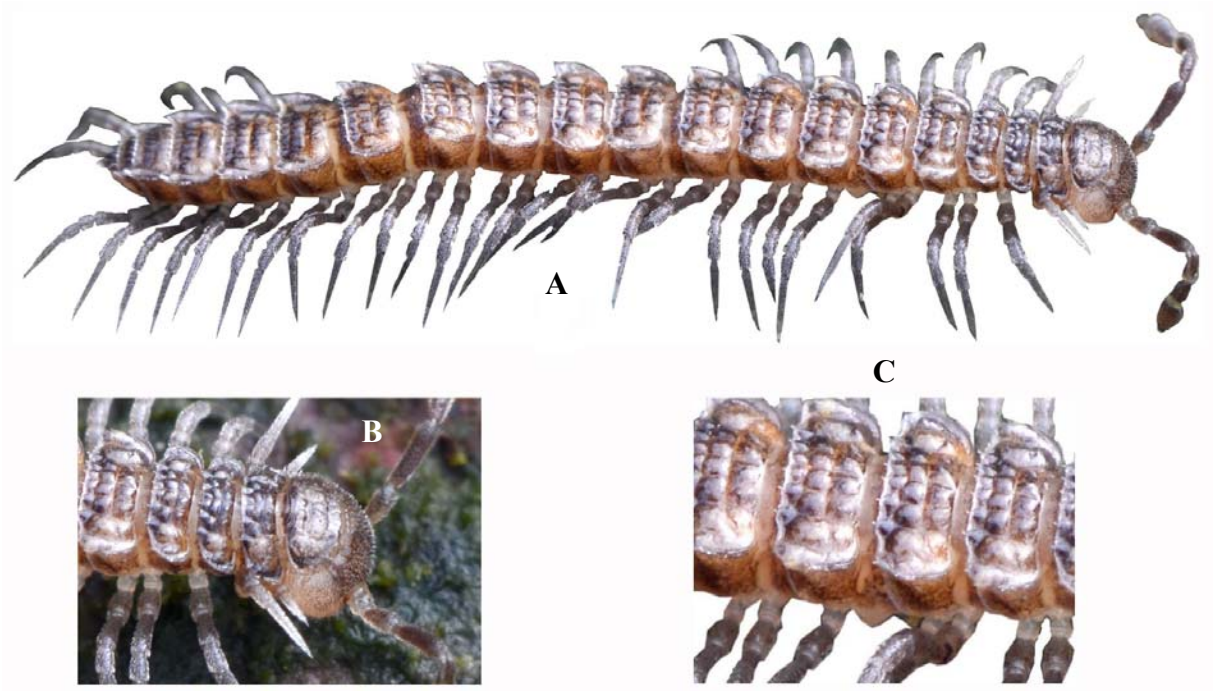


FIGURE 1: *Polydesmus asthenestatus*. Female specimen from Lagan Meadows, 23 January 2015
A) habitus, length approx. 11 mm; B) close-up of head to show pubescence; C) close up of median tergites to show spines on basal tubercles.

The cephalon is evenly and densely pubescent (Fig. 1B). In other British polydesmids pubescence may be absent, somewhat scattered but certainly less even. Dorsal sculpture of the tergites is distinct and well incised with the boss divided transversely. Basal margins of the tergites are ornamented

with short spines, a distinctive feature, each spine issuing from one of the six basal tubercles, being obvious in all tergites (Fig. 1C). In other species these spines are either absent or developed only in the distal tergites and then much smaller and less distinct.

The gonopods are relatively small and inconspicuous. The right telopodite is illustrated in Fig. 2, from an external perspective. The exomerite (ex) of each telopodite is broadened apically with a downward pointing apical tooth and a single, small, sub-terminal tooth below the apex (the Corsican form of the species, ssp. *albanensis* Verhoeff appears to have several teeth, Demange, 1981). Between the apical tooth and subterminal tooth a pale internal sac (?flagellum) protrudes. It can be seen from an internal (mesal) view and comes to a point (see Attems, 127: fig. 26), but this may just be visible from an external viewpoint. The exomerite (ex) is much smaller in relation to the seminal ramus (sr) which lies below it, than in other British *Polydesmus*. The ramus is broadly similar in shape to that of other species but the solenomere is usually somewhat broader and more conspicuous than in other species.

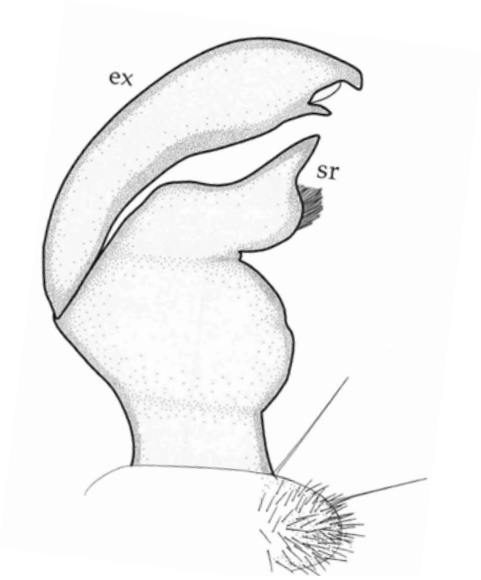


FIGURE 2: ***Polydesmus asthenestatus,* male.** External view of right telopodite ex - exomerite; sr - seminal ramus with solenomere.

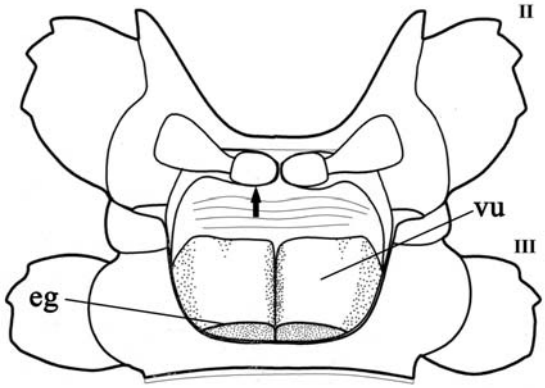


FIGURE 3: ***Polydesmus asthenestatus,* female.** Ventral view of the second pair of legs on segment III of a female: vu - vulva; eg - epigyne.

Overall, the main differences from other British *Polydesmus* consist in the small size of the exomerite and of the gonopods as a whole. Comparing it with *Brachydesmus superus,* which has a similar body size, the exomerite in *P. asthenestatus* is depressed against the seminal ramus, and points towards the rear of the animal, whereas in *Brachydesmus* it is lifted off the coxopodites and directed forwards towards the preceding pairs of legs.

The female genitalia (Fig. 3) are very inconspicuous and may only be seen by pulling the second pair of legs forward to reveal the vulva (vu) and epigynal ridge (eg) underneath.

GEOGRAPHICAL DISTRIBUTION

At present *Polydesmus asthenestatus* is known from 9 locations in south Co. Antrim and north Co. Down, all within a 14 mile radius of Belfast city centre as well as a recently discovered site south of Dublin. These are as follows:

National Trust at Minnowburn Beeches (J327686), Co. Down, 6.ii.2008. Abundant on sticks and in litter under beech on dry south-facing slopes.

Six Mile Water river valley at Muckamore (J157853, J158853), Co. Antrim, 8.iii.2008. Occasional, on branches and twigs of beech on the ground, sheltered riverine woods south of Antrim town.

Lady Dixon Park, south Belfast (J308679), Co. Antrim, 19.i.2009. Abundant in wood chip in a Belfast Parks Department waste tip, under mature broadleaf trees.

Hillmount Garden Centre, south Belfast (J392712), 20.v.2012. Several under large pots with shrubs and sapling trees.

Lady Dixon Park (J306680), 25.ix.2012. Several stadium-I individuals in soil under planted green alder in formal beds.

Orangefield Park, east Belfast (J372730), Co. Down, 3.ii.2013. Occasional in leaf litter under young oak/ash/beech saplings.

Cultra Manor, Ulster Folk and Transport Museum (J425803), Co. Down, 20.iii.2013. Occasional under sacks of plant waste, derelict greenhouses.

Belvoir Forest (J333685), Co. Down, 15.ix.2014. Common under dense ivy on the trunk of a mature sycamore in parkland.

Lagan Meadows (J334703), Co. Antrim, 23.i.2015. Common in dead leaves, underside of large *Carex paniculata* tussocks, riverine wetland.

Avoca Garden Centre (O24281524), Kilmacanoge, Co. Wicklow, 11.iv.2015. Two females and one male under plant pots on gravelly soil in a large garden and plant sales area.

It is clear from the spread of sites that introduction has occurred independently in a least three areas, one in the Lagan Valley just to the west of Belfast, one south of the town of Antrim town (Muckamore), Co. Antrim and at Kilmacanoge, Co. Wicklow. The Antrim (Muckamore) site is in the Six Mile Water valley close to an agricultural college with an organic farm unit. A large outbreak of the alien pest slug *Arion vulgaris* (Moquin-Tandon) occurred recently in the Six Mile Water valley close to the farm reaching as far south as Muckamore. The source of this was subsequently found in the organic unit where a very large population had become established (Anderson, 2010). Similar outbreaks have occurred at organic units elsewhere in Ireland (pers. obs.) and may be a source of other invasive fauna. The first Belfast locality at which *P. asthenestatus* was found is Minnowburn Beeches, a National Trust property in the valley of the River Lagan west of the city. National Trust properties in Northern Ireland have been notable in the past for their rapid colonisation by *Anamastigona pulchella* in the 1990s (Anderson, 1996). The suspicion is that this pattern reflects introduction via similar mechanisms to that of *P. asthenestatus,* from north Italy. The same would presumably apply to the discovery of the species in a garden centre in Co. Wicklow.

Polydesmus asthenestatus is now well established at a number of localities and is likely to spread not least because of its high fecundity.

ECOLOGY

There are only sparse references to habitat and ecology of this species in the literature. In Northern Ireland it has been found mostly in wet woodland such as alder carr along river valleys. Although not so far reported from domestic gardens there is some evidence for synanthropic tendencies with two records for garden centres and one for abandoned greenhouses in a publically owned site. Most

specimens have been taken in and on beds of leaf litter under trees, particularly beech. Drifts of beech litter can have in excess of 100 specimens per m^2. Animals are also common on the underside of fallen branches, particularly decorticate branches slightly raised off the ground. Up to 40 specimens have been found under a single branch. It has not so far been detected under bark on logs and fallen branches nor does it occur on trees except on bark surface close to the ground. It has rarely been found under stones. While slow to move when first uncovered, locomotion quickly becomes fluid and rapid.

BEHAVIOUR/SEASONALITY

Verhoeff (1941) studied the species in mainland Italy and states that it is very much a 'winter' species attaining maturity in mid-winter to early spring before mating and dying. This correlates well with observations in Ireland where eggs have been recorded (in captivity) from the beginning of February. Very young animals (stadium I) have been observed in September but there are no records for the summer period (June to August inclusive). Sub-adults are often abundant in December and mature specimens are very much in evidence by the beginning of February. It is not known when the eggs hatch but it seems likely that this occurs in late summer/early autumn.

Figure 4 shows a clutch of eggs laid in February in a specially constructed 'nest' made of a pabulum of leaf material and sandwiched between a solid piece of bark and underlying dead leaves. It contained 100-120 ova.

FIGURE 4. 'Nest' of leaf fragments on the underside of bark in litter.

CONCLUSIONS

This small, active *Polydesmus* is an addition to the fauna of northern Europe and is indigenous to north-western Italy and Corsica. It is a winter species and clearly resistant to low temperatures as observed by its presence and activity in surface leaf litter during the very cold winters of 2010/11 and 2012/13.

The species is well established and continues to spread in north-eastern Ireland. Since 2008 it has become well established in woodlands north, south and east of Belfast and there is now a single record for a garden centre in Co. Wicklow. It shows a small degree of synanthropic behaviour and will breed successfully in captivity. The eventual colonisation of disturbed habitats and gardens seems likely. Like *Anamastigona pulchella*, it could also turn up in Britain. Wet woodland, primarily riverine alder woods, appear to be favoured.

Although I have now had several years experience of this species, it still takes careful examination to discriminate it from dark specimens of *Brachydesmus superus*. I therefore recommend close examination of dark *Brachydesmus* in Britain where it could easily have been overlooked.

REFERENCE SPECIMENS

Specimens have been deposited in the British Myriapod and Isopod Group reference collection, the Natural History Museum, London and National Museum of Ireland, Dublin.

REFERENCES

Anderson, R. (1996) *Anamastigona pulchellum* (Silvestri) an addition to the fauna of northern Europe, recorded from Ireland. *Bulletin of the British Myriapod Group*, **12**: 7-11.

Anderson, R. (2010) The invasive pest slug *Arion vulgaris* Moquin-Tandon (= *lusitanicus* Mabille) (Mollusca: Arionidae) confirmed for Ireland with an appeal for records. *Irish Naturalist's Journal* **31**: 69-70.

Attems, C. M.T. (1927) Űber palaearktische Diplopoden. *Archiv fűr Naturgeschichte* **92:** 1-256.

Blower, J.G. (1985) Millipedes. *Linnean Society Synopses of the British Fauna (New Series) No. 35.* Leiden: Brill / Backhuys.

Demange, J.-M. (1981) *Les Milles-Pattes.* Boubée, Paris.

Lee, P. (2006) *Atlas of the millipedes (Diplopoda) of Britain and Ireland.* Pensoft Series Faunistica #59, Sofia-Moscow.

Minelli. A., Ruffo S. & LaPosta S. (1995) *Myriapoda, Hexapoda excl. Pterygota.* Checklist delle Specie della Fauna d'Italia, Parts 32-33. Calderini, Italy.

Stoch, F. (2003) Order Polydesmida. http://www.faunaitalia.it/checklist/invertebrates/families/Polydesmidae.html Viewed online, June 2013.

Verhoeff, K.W. (1941) Diplopoden der Insel Ischia, systematisch, morphologisch, phänologisch, ökologisch, geographisch. *Zoomorphology* **38**(1): 147-196.

ORITONISCUS FLAVUS (BUDDE-LUND, 1906) – A WOODLOUSE NEW TO SCOTLAND (ISOPODA: ONISCIDEA: TRICHONISCIDAE).

Duncan Sivell[1] & Steve J. Gregory[2]

[1] Natural History Museum, Department of Life Sciences, Cromwell Road, London, SW7 5BD, UK
E-mail: d.sivell@nhm.ac.uk

[2] 200 Ock Street, Abingdon, Oxfordshire, OX14 5DR, UK.
E-mail: stevejgregory@btopenworld.com

INTRODUCTION

One of us (DS) collected a number of female specimens of a large (up to 7 mm), darkly pigmented trichoniscid woodlouse with a prominent single ommatidium from Melville Castle, near Edinburgh (NT306667, VC 83) in September 2010 as part of a Wildlife Information Centre survey. These specimens were found under moss in mixed woodland. On the basis of external morphology the specimens readily keyed (using Hopkin, 1991) to *Oritoniscus flavus* (Budde-Lund, 1906).

This species is known to occur widely in Ireland (Doogue & Harding, 1982). In 1994 a population, presumed introduced, was discovered in south Wales (Morgan, 1994), but otherwise it is unknown from the British mainland (Gregory, 2009). The Irish distribution of *O. flavus* is centred on an area known to support thermophilous species (Doogue & Harding, 1982) suggesting it favours the moist climate and mild winters found in southern Ireland. In contrast Edinburgh lies on the 'cold and dry' north-east coast of Britain. Thus, it was queried by SJG whether the specimens were referable to another morphologically similar continental species such as *Hyloniscus riparius* (Koch, 1838), an expansive species that is widespread in the Netherlands (Berg, *et al*, 2008).

CONFIRMATION OF IDENTIFICATION

A return visit to the area by DS in February 2011 resulted in the discovery of numerous specimens at two additional sites along the River North Esk (Sivell, 2011). Firstly, at Dalkeith Country Park (NT333677) specimens were widely found among well-developed leaf litter on the woodland floor along a several hundred metre length of the river. Secondly, by the riverside cycle path between Whitecraig and Musselburgh (NT345708) numerous specimens were observed under moss on the banks of the river (Table 1). The samples collected included a male specimen from each site. These were confirmed by SJG to be *Oritoniscus flavus s. str.* (Budde-Lund, 1906). These records extend the global range of this species about 200 km further north of previous records from County Meath in Ireland (Doogue & Harding, 1982) (Fig. 1).

In April 2015 SJG visited Dalkeith Country Park (during the BMIG 2015 field meeting to Linlithgow). On this occasion the leaf-litter on the woodland floor was very dry (despite the presence of a typical wet woodland flora, including carpets of Opposite-leaved Golden Saxifrage *Chrysosplenium oppositifolium* and Ramsons *Allium ursinum*) and *O. flavus* proved elusive. Five specimens (including two males) were found with difficulty at the base of the river bank where deep accumulations of leaf-litter and flood debris had maintained suitably damp conditions beneath. In the field these were reminiscent of a dark immature *Philoscia muscorum* (Figs. 2 & 3). Here other moisture loving species, including Marsh Slug *Deroceras laeve* Müller and the millipede *Craspedosoma rawlinsii* Leach, were also recorded. A few additional specimens of *O. flavus* were found by Keith Lugg in a water-logged heap of rotting grass-cuttings beside an access track nearby.

TABLE 1: The first records of *Oritoniscus flavus s. str.* in Midlothian, Scotland in chronological order. DS = Duncan Sivell, SJG = Steve Gregory, KL = Keith Lugg

Locality	Grid reference	Vice County	Number of specimens	Date	Collector
Melville Castle	NT306667	VC 83	Many specimens observed: few ♀♀ collected	19.x.2010	DS
Dalkeith Country Park	NT333677	VC 83	Many specimens observed: 3 ♂♂ & 5 ♀♀ collected	04.ii.2011	DS
Whitecraig cycle path	NT345708	VC 83	Many specimens observed: 2 ♂♂ & 5 ♀♀ collected	04.ii.2011	DS
Dalkeith Country Park	NT333677	VC 83	2 ♂♂ & 5 ♀♀ found with difficulty	11.iv.2015	SJG, KL

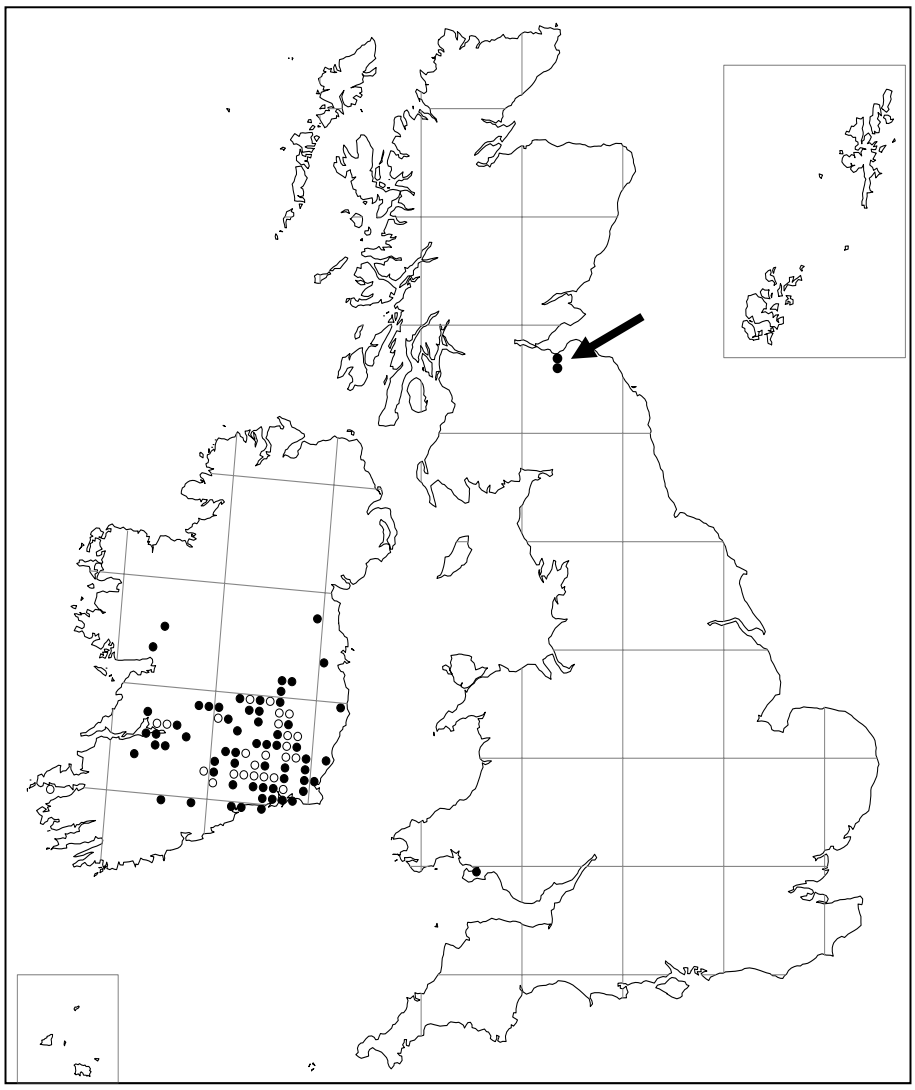


FIGURE 1: Distribution map showing 10km records for *Oritoniscus flavus* in Britain and Ireland (after Gregory, 2009). Scottish records, reported herein, are arrowed.

FIGURES 1 and 2: Specimen of *Oritoniscus flavus* from Dalkeith Country Park, 11.iv.2015
(images © Keith Lugg)

IDENTIFICATION OF *ORITONISCUS FLAVUS*

The four male specimens examined were between 4.5 and 5.5 mm in length. Females were between 5.5 and 7 mm. Although darkly pigmented purple-red in life, specimens gradually faded to straw yellow upon preservation in alcohol. The specimens are stored in 75% ethanol and currently retained in the personal collections of the authors.

The *Oritoniscus flavus* described in standard British identifications works (i.e. Hopkin, 1991 and Oliver & Meechan, 1993) has been shown by Dalens, *et al* (1996) to be a complex of three closely related species: *O. violaceus* Dalens, Rousset & Fournier, 1996; *O. intermedius* Vandel, 1957; and *O. flavus* (Budde-Lund, 1906). The same publication cited specimens from the Irish and Welsh populations as being referable to *O. flavus s. str.*

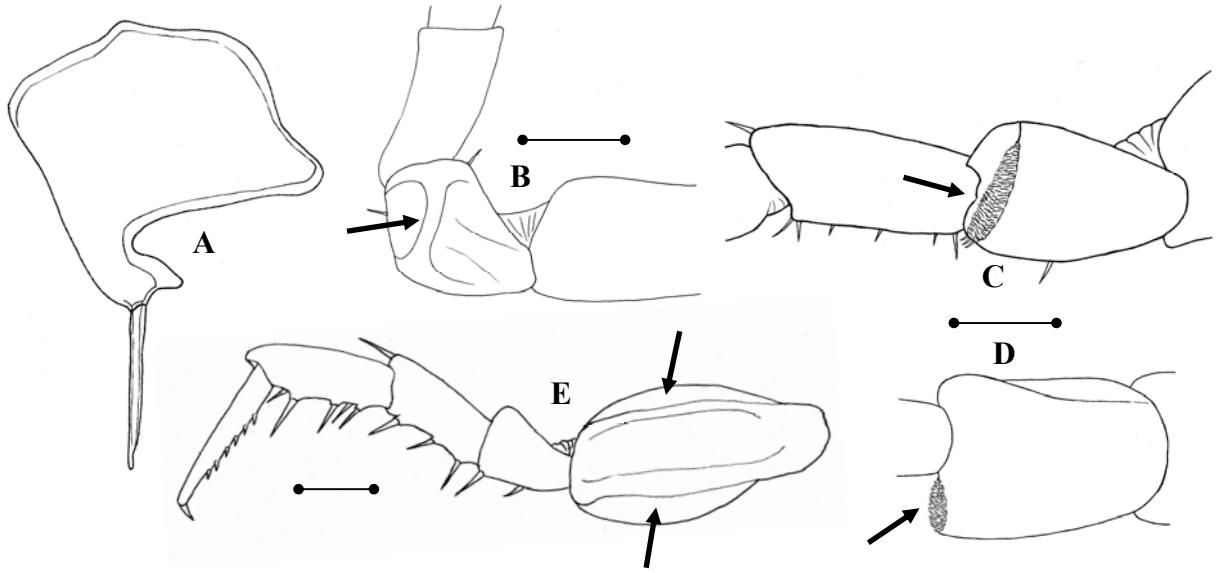


FIGURE 2: *Oritoniscus flavus* (Budde-Lund) male. Dalkeith Country Park, 4.ii.2011
A) Exopodite of first male pleopod; B) Second pereiopod, ischium and merus, posterior view; C) Third pereiopod, ischium and merus, anterior view; D) Third pereiopod, ischium, dorsal view; E) Fifth pereiopod, posterior view. Scale bars = 0.2 mm

It is not possible to reliably separate these three species on the basis male first pleopod (Fig. 2A), as figured in Hopkin (1991) and Oliver & Meechan (1993), because they do not differ significantly in shape between the three species. However, male specimens of *O. flavus* are readily distinguished from those of *O. intermedius* or *O. violaceus* by examination of the second, third and fifth pereiopods. Females cannot be reliably identified.

In *Oritoniscus flavus s. str*. the basis of the fifth pereiopod appears very swollen relative to the other articles due to the presence of well developed flanges directed both dorsally and ventrally from the anterior surface (Fig. 2E, arrowed). This character is absent in *O. intermedius* and *O. violaceus* (Dalens, *et al*, 1996) and provides a simple means of identification. In addition, the ischium of the second pereiopod bears a shallow hollow at each end on the posterior surface, to leave a conspicuous rounded ridge rising between (Fig. 2B, arrowed). Another easily seen character is found on the ischium of the third pereiopod which at the distal end bears a prominent flat-topped bulge on its anterior face, covered with pointed scales (Fig. 2C, arrowed). This is most easily seen by viewing the ischium from dorsal or ventral view (Fig. 2D).

DISCUSSION

Oritoniscus flavus was found to be numerous at each of its three River North Esk localities, so it appears to be well established locally. The habitats and micro-sites that it was recorded in are very similar to those noted in Ireland where it is typically associated with river and stream valleys, occurring under leaf litter, stones and dead wood (Doogue & Harding, 1982). The three known River North Esk populations are widely separated which suggests that a recent introduction is unlikely, and it may have been present, unnoticed, for many decades.

The Edinburgh area has been relatively well worked for woodlice (Gregory, 2009), so it may be that *O. flavus* is restricted to the River North Esk. From 2011 to 2013 further searches for this species were made by DS in the winter months, further downstream in Musselburgh (NT338723) and upstream from Polton (NT288647) to Roslin Glen (NT271627), but *O. flavus* was not seen at these other sites. It therefore appears to be restricted to a length of the River North Esk between 7 and 15 km long, based on findings so far. None-the-less, it will be interesting to see whether this woodlouse can be found along other river systems in the Edinburgh area. In France it is thought that the species may be dispersed along with flood debris during flood events (Franck Noël, pers. comm.).

Dalens *et al* (1996) considered *O. flavus* to be an expansive species that is spreading northwards and westwards from its native Pyrenean stronghold. Noël & Séchet (2007) report its recent discovery in the departments of Maine et Loire, Deux-Sèvres and Vendée in north-west France. In Ireland its strong association with semi-natural habitats has been taken as evidence of its native status (Doogue & Harding, 1982), but Cawley (2001) considers it may be an ancient introduction. In south Wales, Morgan & Pryce (1995) consider *O. flavus* to be a relatively recent colonist, possibly introduced via the once thriving coal exporting trade of the Llanelli region. Its discovery in south Wales, wherever its origin, supports the view that it has good dispersal ability and is able to successfully colonise new localities.

Given the isolated nature of the Scottish populations, some 500 km north of the other known British site in south Wales, it also seems highly probable that *O. flavus* has been unintentionally introduced into the valley of the River North Esk. However, there is a wide difference in latitude, and climate, between south Wales and eastern Scotland and the ability of *O. flavus* to adapt to new localities seems extraordinary.

The obvious question is how did the south-western *O. flavus* get to eastern Scotland? One possible route of introduction to Melville Castle is via the importation of exotic trees and plants into the gardens during the Victorian period. A second possible route of introduction is via the nearby Melville Nurseries, a commercial plant nursery, which according to old aerial photographs once comprised a large complex of glass houses until at least the 1940s (available online at http://maps.nls.uk).

A second puzzle is how a species with a distinct south-western distribution in Britain and Ireland, that apparently favours the high humidity and warm winters of the Atlantic climate, can survive in eastern Scotland? The east coast of Scotland is considerably colder, and has much lower rainfall, than Ireland or south Wales. Although Mellville Castle lies on a south facing slope, it is unlikely that the valley of the River North Esk will receive much direct heat from the sun. At the known Pyrenean sites for *O. flavus* (cited in Dalens *et al*, 1996) the winters are likely to be cold, with the ground covered with snow at times. In many ways this is perhaps not dissimilar to winters in eastern Scotland. As to humidity, it is probable that *O. flavus* becomes more restricted to wet micro-sites in the less humid east coast of Scotland. Certainly in April 2015 the species proved very elusive at Dalkeith Country Park (Table 1) when the woodland floor had dried out. Specimens could only be found where damp conditions prevailed, such as beneath deep accumulations of leaf-litter and flood debris. It is of note that a few specimens were also collected from a saturated heap of rotting grass-cuttings, indicating that the species is able to exploit other suitably damp micro-sites.

On the basis of these Scottish observations, there is no obvious reason why *Oritoniscus flavus* should not occur at other sites in Britain.

ACKNOWLEDGEMENTS

We thank Glynn Collis for his helpful comments regarding the likely mechanisms of introduction and establishment of *O. flavus* along the River North Esk.

Keith Lugg kindly permitted the use of his images of *O. flavus* collected from Dalkeith during the BMIG 2015 field meeting to Linlithgow.

The distribution map was plotted using the DMapW mapping programme developed by Alan J. Morton.

REFERENCES

Berg, M.P., Soesbergen, M., Tempelman, D. & Wijnhoven, H. (2008). *Verspreidingsatlas pisse-bedden, duizendpoten en miljoenpoten (Isopoda, Chilopoda, Diplopoda)*. EIS-Nerderland, Leiden.

Cawley, M. (2001). Notes and records on the Irish woodlice (Crustacea: Isopoda), including new sites for *Halophiloscia couchi* (Kinahan). *Bulletin of the Irish Biogeographical Society* **25**: 211-217.

Dalens, H, Rousset, A. & Fournier, D. (1996). Les formes epigées du genre *Oritoniscus* (Crustacea, Isopoda, Oniscidea). I. Le complexe *Oritoniscus flavus*. *Revue Suisse de Zoologie* **103 (3)**: 623-641.

Doogue, D. & Harding, P.T. (1982). *Distribution Atlas of Woodlice in Ireland*. An Foras Forbartha. Dublin.

Gregory, S. (2009) *Woodlice and Waterlice (Isopoda: Oniscidea & Asellota) in Britain and Ireland*. Shrewsbury: FSC Publications.

Hopkin, S.P. (1991). *A key to the woodlice of Britain and Ireland*. AIDGAP, Field Studies Council Publication. Preston Montford. (reprinted from *Field Studies* **7**: 599-650.)

Oliver, P.G. & Meechan, C.J. (1993). *Woodlice. Synopses of the British Fauna (New Series)*. Field Studies Council. Preston Montford.

Morgan, I.K. (1994) *Oritoniscus flavus*, new to Britain – in Carmarthenshire, south-west Wales. *British Isopod Study Group Newsletter* **37**: 1-2 (*unpublished*).

Morgan, I.K. & Pryce R.D. (Eds.) (1995). *The Bulletin of the Llanelli Naturalists'* **1**: 23.

Noël, F. & Séchet, E. (2007) Crustacés Isopodes terrestres du Nord-Ouest de la France (Crustacea: Isopoda: Oniscidea). *Invertebres Armoricains* **2**: 1-48.

Sivell, D. (2011) A new woodlouse for Scotland! *Scottish Invertebrate News* Vol. **2**, Issue 1; p.3 (*unpublished*).

TWO GONOPOD SPURS IN A SPECIMEN OF *LITHOBIUS TRICUSPIS* (CHILOPODA: LITHOBIIDAE)

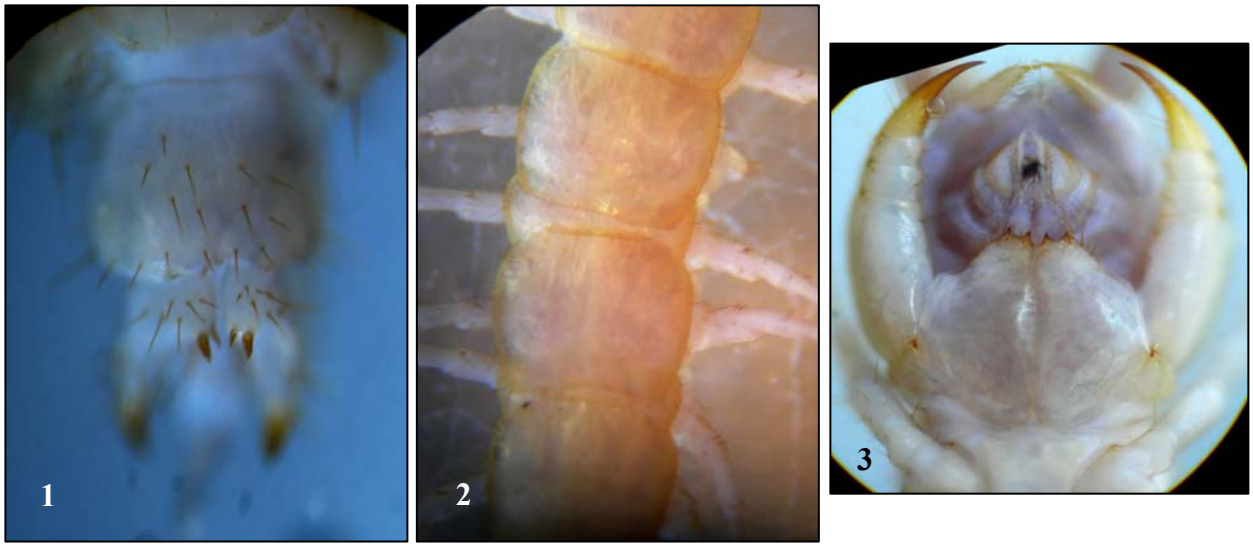
A. D. Barber[1] & Christian Owen[2]

[1] Rathgar, Exeter Road, Ivybridge, Devon, PL21 0BD, UK.
E-mail: abarber159@btinternet.com

[2] E-mail: christian.owen49@yahoo.com

In the previous volume of this Bulletin (Robinson & Barber, 2014) the occurrence of three gonopod spurs on each side on a female *Lithobius melanops* from North Yorkshire was reported. Initial examination had led to preliminary speculation that it might have been an example of the somewhat similar species *Lithobius tricuspis*. However the shape of the prosternal teeth, the absence of the spine 15VaC and other features led to the conclusion that it was, in fact, *L. melanops*, a species in which the presence of additional spurs in this way is not unknown.

The present specimen is indeed one of *Lithobius tricuspis*, a 10mm female but with only two gonopod spurs on each side (Fig. 1) leading to confusion when using the standard keys. It was collected by one of us (CO) on 26.x.2014 at Groes-faen Wood, South Wales, a site from which both *L. tricuspis* and two millipede species new to Britain have been recorded (Telfer, *et al*, in this Bulletin **28**:15-30). There are clear posterior projections on tergites T9 and T11 (Fig. 2), a double claw on the last leg and 2+2 prosternal teeth (Fig. 3). However the latter are unlike those of *L. melanops*, *Lithobius macilentus* or *Lithobius borealis* the other British species with similar characteristics.



FIGURES 1-3: *Lithobius tricuspis* female, Groes-faen Wood
1) Posterior end, ventral view, showing 2+2 gonopod spurs; 2) Tergites 8-12, showing posterior projections on T9 and T11; 3) Head, ventral view, showing 2+2 prosternal teeth

Some photographs of the specimen were sent to Marzio Zapparolli of Viterbo who commented that one would expect to find 3+3 spurs in a 10mm immature *L. tricuspis* and suggested checking the number of antennal articles. These are much higher in *L. tricuspis* (38-50) than in the similar but doubtfully British *Lithobius agilis* which has only 29-35 (Iorio, 2010) and a examination of one of the now detached antennae gave a figure of 46 which agrees with a diagnosis of *L. tricuspis*, a

species which occurs in the woodland concerned. Iorio (2010) comments that "Dans les Alpes-Maritimes, on peut observer occaisionnellement 2+2 éperons chez les populations de *L.(L.) tricuspis*." It is interesting that on this specimen, the outermost of the two spurs on each side is much larger than the inner one, a situation reminiscent of the "normal" 3+3 spur condition where the inner one of the three is markedly smaller.

Brolemann (1935) and Iorio (2010) both indicate the presence of the spine 15VaC (15VaH) as characteristic of *L. tricuspis* and use it in their keys. However, Eason (1965) refers to the frequent deficiency of this spine and in his account of the collection of the first specimens from Devon remarks that, of the six specimens in his series, one female is without 15VaC and therefore agrees with the definition of *L. tricuspis* var. *minor* Brol. (= var. *tridens* Verh.), whilst three others have it on one side only. This suggests that it might be unwise to assume that the apparent absence of this spine would eliminate *L. tricuspis* during identification. The Linnean Society Synopsis (Barber, 2009) follows Eason in indicating that the spine may be present or absent. The present specimen appears to show this spine on the right hand side and what might possibly be a scar of it on the left; both 15th legs have become detached.

Reference to Eason (1965) will show a list of variation within the species as described at various times including the presence of 2+2 spurs, 15VaC absent and a single claw on the last leg as well as variability in the genital claw.

The present known British distribution of *L. tricuspis* centres on an area of South Devon from Dartmoor to the coast to the Exeter area with a single record from Bere Ferrers to the west (D. Bolton, 1999). There is also a record from the Isle of Wight from about 1980 (A. N. Keay). In addition we have an old cave record (1965) from Lamb Leer Cavern in the Mendips (coll A. E. McR Pearce – Cave Research Group files). It has been recorded at the South Wales site on a number of occasions since first being found in 2010 and this seems a well established colony. Potentially it could be found elsewhere in SW Britain.

REFERENCES

Barber, A.D. (2009) *Centipedes*. Synopses of the British Fauna (New Series) **58**. Shrewsbury, Field Studies Council.

Brolemann, H. (1935) Myriapodes, Chilopodes. *Faune de France* **25**: 1-405.

Eason, E.H. (1965) On *Lithobius tricuspis* Meinert (Chilopoda, Lithobiidae) in Britain. *Annals & Magazine of Natural History* (13) **8**: 285-295.

Iorio, E. (2010) Lithobies de France. *Revue de l`Association Roussillonaise d`Entomologie*. **19** (Supplement): 1-104.

Robinson, M.F. & Barber, A. D. (2014) Three female gonopod spurs in a specimen of *Lithobius melanops*. *Bulletin of the British Myriapod & Isopod Group*. **27**: 41-42.

THE "IKEA MILLIPEDE", *XENOBOLUS CARNIFEX* (DIPLOPODA, SPIROBOLIDA, PACHYBOLIDAE) FOUND IN DUBLIN

A. D. Barber

Rathgar, Exeter Road, Ivybridge, Devon PL21 0BD, UK.
E-mail: abarber159@btinternet.com

In January 2013 I received an e-mail from Eugenie Reagan then at The National Biodiversity Centre, Waterford (now working at the UN World Conservation Monitoring Centre, Cambridge, England) with a photograph of a striking red and black millipede found in a house plant labelled *Livistonia rotundifolia* which had been purchased in Ikea in Dublin on 10th January 2013 and was described as "made in the Netherlands". The finder, Derek Brown, had sent the picture (Fig. 1) to Collette O`Flynn of NBDC. As a consequence of its origin it became nicknamed the "Ikea millipede". The finder enquired as to whether it was native and should therefore be released.

It was clearly not one of the native Irish species, certainly not the only one of which even vaguely like it, *Ommatoiulus sabulosus* with its two orange-red longitudinal lines. I advised the finder not to release it in the hope that we might be able to get it identified and also on the basis that relevant Irish authorities would probably not favour its release as it was clearly a non-native species.

FIGURE 1: *Xenobolus carnifex* in plant pot containing *Livistonia* (image D. Brown)

I circulated the photograph amongst the myriapod community via *yahoogroups* and Thomas Wesener of Bonn expressed an interest in looking at the specimen suggesting that it was definitely a spirobolid and a member of the Pachybolidae with the name *Xenobolus carnifex*, a kind of pest species, from India and Sri Lanka coming to mind. He also told us how he had been at Ikea in Cologne looking at the pot plants (which were not very exciting apart from the *Livistonia*). He found two genera of polydesmid millipedes, an ant nest, lepidopterous larvae and a small spider but no further specimens of the ?*Xenobolus*. He described the humid roots and substrate of the *Livistonia* as apparently a perfect habitat for bugs. After looking at about 20 plants, finding living arthropods in almost every one, he discovered "people looking at me strangely". He also commented that, on the basis of the giant polydesmids found in their Ikea palms they got their stuff from South America rather than India/Sri Lanka.

FIGURES 2-3: *Xenobolus carnifex* 2) ventral view 3) dorsal view (images D. Brown)
Scale = 1 Euro coin

At Thomas`s suggestion, arrangements were made for him to examine the specimen and to extract DNA. For this purpose it was first sent to Collette at Waterford where it could be preserved in a suitable form (95% alcohol) before onward transmission to Bonn. The specimen (Figs 2 – 3) was an immature male with 48+1 rings, no tarsal pads and just a trace of elongated coxae 3 & 4. Colour was ventrally red with red appendages, laterally black and dorsally a red stripe; head and anterior collum red and the telson, except for the apical part red also. Henrik Enghoff (Copenhagen), who had also been consulted, compared it with his specimens of *X. carnifex* and agreed with the identification. He commented that *X. carnifex* seems to be quite synanthropic in India/Sri Lanka and would therefore be quite prone to being exported.

In due course, Thomas was able to extract DNA and sequence the CO1 barcoding gene and confirm that it was indeed *X. carnifex*.

ACKNOWLEDGEMENTS

Thanks to everyone involved in this exercise, Derek Brown (Dublin), Eugenie Reagan & Collette O`Flynn (Biodiversity Ireland, Waterford), Thomas Wesener (Bonn) & Henrik Enghoff (Copenhagen). The description is that given by Thomas Wesener, photographs by Derek Brown.

VERNACULAR NAMES OF WOODLICE WITH PARTICULAR REFERENCE TO DEVONSHIRE

A. D. Barber

Rathgar, Exeter Road, Ivybridge, Devon, PL21 0BD, UK.
E-mail: abarber159@btinternet.com

INTRODUCTION

Many people, if asked, will have recollections of one or two or maybe more "old" (i.e. traditional / local) names for woodlice either from their own childhood or from what their parents / grandparents may have told them although, disappointingly, many present day schoolchildren only know them as woodlice. In Scotland the usual common name for these animals was "slater", a name which persists in more southern parts in naming *Asellus* as "water slater" and *Ligia* as "sea slater". In *Fauna Britannica*, Stefan Buczaki (Buczaki, 2002) comments that woodlice "have acquired far more names than any other British animal".

In 1917, W. E. Collinge of St. Andrew`s University, in a letter to *Nature* (Collinge, 1917), appealed to readers for information relating to folk-lore and local names of woodlice, remarking that he had more than a hundred local names such as bibble-bug, chisel-hog, cud-worm, palmer, lock-chester, slater, tiggy-hog and had noted districts in which the they were in use. His appeal seems to have fallen on deaf ears as there were no letters in that journal responding to this appeal over the following weeks. Some years later he prepared lists of nearly 70 names with localities for most of those that he had collected (Collinge, 1935, 1946). These included some Gaelic, Manx and Irish ones.

Buczaki (2002) listed more than 150 of names, some of which are clearly variants on each other, remarking that the list was not exhaustive and was based on those of Collinge, H. G. Hurrell and Gillian Moore and communicated to him by Stella Turk. In some cases he indicated a specific county, village or other area from where the name came. Moore (1965) had published a report on dialect in the Devonshire Association Transactions which is referred to later. H. G. Hurrell, the naturalist, lived at Wrangaton on the southern flank of Dartmoor and had a list of more than a hundred woodlice names when I met him soon after coming to Devon in the 1970s. There is likely, therefore, to be a significant South-West England content in the Buczaki list. Internet searches yield further remarks on woodlice names for both Britain and Ireland and elsewhere.

Arthur Chater in his *Woodlice in the cultural consciousness of modern Europe* (Chater, 1988) provided an interesting exploration of attitudes to woodlice and it is in this context that the origins of popular names can be considered.

In terms of differentiating the various kinds of woodlice, Schmallfuss (1984) divided terrestrial isopods into ecomorphological groups; runners, clingers, rollers, spiny forms and non-conformists and behavioural traits and ecology clearly influence the way we think of them. Probably most people in Britain would recognize only two or perhaps three of these categories. Rollers (= pill bugs, pea bugs, etc.) are easily distinguished from what we might, for convenience, call "slaters". People also tend to note unusual colour forms and may see colour as distinguishing different kinds of woodlice when, in fact, a single species might show a wide range of colours as for instance in *Porcellio scaber*. According to Udagawa (1989) in Japan there are three categories recognized; Funa-musi (boat/ship = runners), Warazi-musi (sandals or flat shoes made from rice stems = clingers) and Dango-musi (a small ball of cooked paste = rollers); Musi is "a bug".

Within his list, Buczaki recognized various groups including pig names, grandfather/grandmother names, names associated with wood, names that suggest an ability to bite, names that suggest smallness and names that refer to the armoured appearance of the body. He said that there was no obvious reason for pig or hog unless it is some perceived ugliness or because they are scavengers. However, I would suggest that seeing clusters of slaters such as *Porcellio scaber* (itself a pig name, little pig) on the underside of a plank of wood, does somehow suggest the backs of a group of pigs in a pen at an agricultural show or field or of piglets feeding from the sow. According to Collinge (1935), Gaers-swyn is an Anglo-Saxon name for woodlice. The names Saint Anthony`s pig or Saint Anthony`s button will refer to the traditional name for the smallest pig in the litter, dedicated to that third century saint ("the Abbot"). Suggestions about biting are, as Buczaki says, erroneous and grandfather/granny can only be "terms of endearment".

Both "woodlouse" and "slater" are 17th century in origin, the latter being more common in Scotland and the north of England. Apparently the name "cudworm" (Shropshire) derives from an old practice of feeding them to cattle supposedly to improve chewing of the cud. Pill-bug is a name relating to a similarity to medicinal pills and at one time, it seems, woodlice were prescribed for treating a wide range of illnesses. Collinge (1946) tells us, amongst other interesting snippets, that in some old books of Materia Medica, we are informed that if the pill-louse is dried and pulverized and put into Rhenish wine; this is an antidote to all obstructions of the bowels, a cure for jaundice, ague, weakening of sight and many other ills. Another recipe, from Gloucestershire, involved stirring 300 live woodlice into six quarts of mild ale, along with raisins, rhubarb and the roots of ferns. Drunk in the spring and autumn it was said to be an "almost" infallible cure for rickets (cited in Laver, 1989).

Given the potential breadth of the subject of English vernacular names in this context, it seems useful to look at one area of England, the county of Devon for which there have been several papers published relating to the subject including those of Moore, Laver (1988) and Smith (2008).

WOODLICE NAMES IN DEVON

Devon, with Cornwall, part of the relatively isolated South-West Peninsula of England, is about 110km (70 miles) from north to south and from east to west with an area of about 6,700 km^2 (2,590 $miles^2$) was, and to a fair extent remains, a largely rural county, with, west of Exeter, relatively poor north-south communication links. Over a many years, groups such as the Devonshire Association have recorded survivals of dialect words (or, as Laver puts it "Demshur mouthspaich") including those used for woodlice. Papers have recorded their local names in the Association`s Transactions and their regionality in the county, relating them to the occurrence of other dialect names e.g. for Devonshire splits (cream & jam) and left-handedness. The only Devon name recorded by Collinge (1935, 1946) is "God`s pigs" whilst Buczaki also reports "chiselbob" (Yealmpton), "granfer greeks" (Modbury) and "horace" (Wembury) all in south/south-west Devon.

Gillian Moore (1965)

Miss Moore, in her report on dialect, came up with 34 terms and many of these had variants, she especially thanked the Devon Federation of Women`s Institutes for their help in gathering this data. Except in Kingsbridge, where she heard "chuggy-pig" from, she suspected, a North Devonian, there was a fairly constant pattern although in some towns and areas as many as four different names were used:

North & West Devon

- chuggy-pig (most common), billy-button, chucky-pig (or –peg), hardy-back, sow-pig.

South Devon (from Plymouth to Exeter)

- granfer-grig (prevailing term), granfer, gammer-zow, granny-picker
- billy-button, carpenter, carpenter`s flea, cheese-bug, cobber, hard-back,
- rolinto ball, soda-pig, sow-pig, St.Anthony`s pig, wood-bug.

The East Devon sowey-peg, pig, sow-pig also extend into this area.

East Devon

- sowey-peg, pig, sow-pig, curly-button, grampus wood-bug, pig-louse, slater, sour-bug, tiddy-hog

(see also Appendix I & II for more detail)

F. J. M. Laver (1988)

Dr. Laver also worked with the Women`s Institutes and circulated a questionnaire through them, again reporting his results in the Devonshire Association Transactions (Laver, 1988) and relating his results to those of Miss Moore. Additional names that were recorded included chizzle-balls, crawlers, flat-backs, fuzzy-pigs, hard-backs, Jacky pigs, nits and Parson`s pigs. Other names included in previous issues of the Transactions included bibble-bugs, coffin-cutters, jovial-lice, mackintoshes, pea bugs, sheel-backs and tanks.

He divided the county into 7 sectors (Table 1; Fig. 1) and recorded the distribution of certain names, grouping together names clearly related together e.g.

- granfer-grigs, grammer sows, grammer sales, gramfa-greys, grandfathers and granfer pigs
- pigs, guinea-pigs, penny-pigs and piggies
- pigs-lice, pig`s fleas
- carpenter, carbender

TABLE 1: Occurrence of woodlice names in 7 areas of Devon according to Laver (1989)

Name	NW	N	NE	E	SE	S	W	Totals
Sow pigs	16	20	13	8	8	4	12	81
Chucky-pigs	4	15	4	3	2	3		31
Granfer-grigs, Grammer sows			4	5	5	6	4	24
Pigs			1	10	1	3		15
Pig`s lice			5	7	2			14
Carpenters					6	3	2	11

J. B. Smith (2008)

In 2008, J. B. Smith revisited the Laver data to look at possible origins of the names referring to various texts including that by Iona & Peter Opie on nursery rhymes (Opie & Opie, 1997). He notes that, within the broad geographical pattern described, most of the names referred to in the Laver corpus suggest some real or fancied resemblance to the pig. “Pig” and “sow” were used in at least

parts of the East Midlands with the latter also being found in both South Devon and Cornwall. This suggests (despite the lack of any national map of woodlouse names) that comparison with the pig has been a widespread motivational factor in naming woodlice. Using the Laver data, he calculates that 165 out of 176 forms (94%) are motivated by relation to pigs although if all names, including the less common, were brought in the proportion would be smaller.

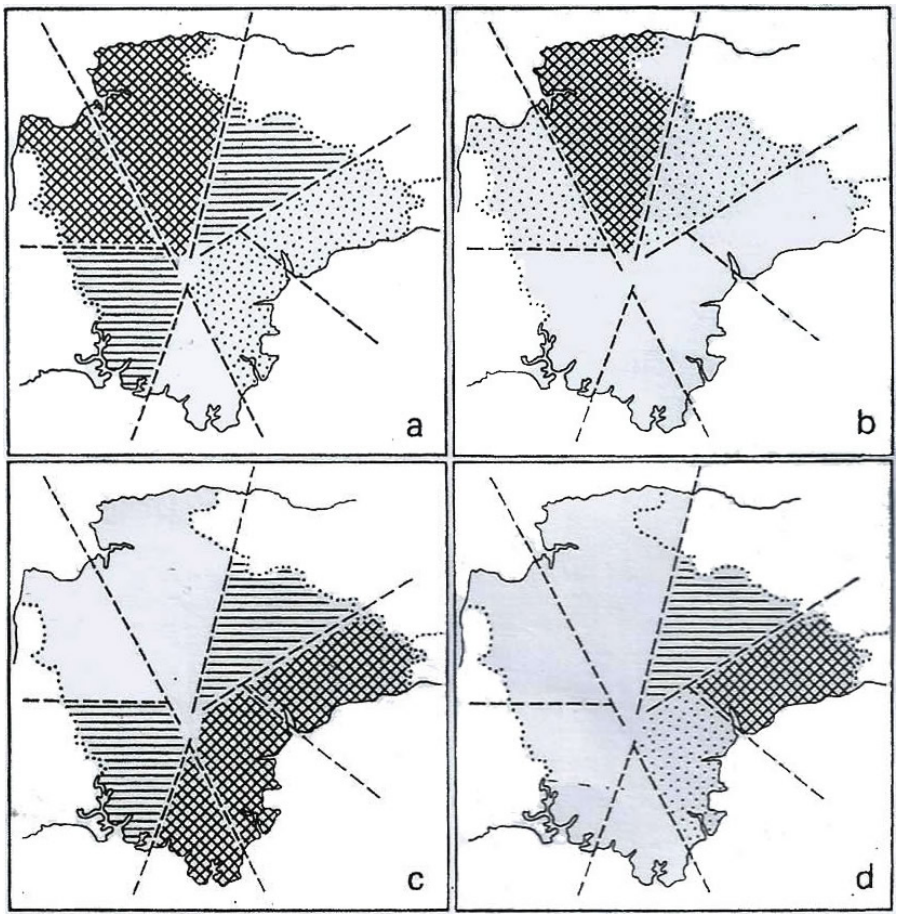


FIGURE 1: Maps of Devon showing predominance of particular names (from Laver, 1989)

a) Sow-pig; b) Chucky-pig; c) Granfer-grig / Grammer-sow; d) Pig/Pig`s Louse

Cross-hatching = principal areas of use; Horizontal lines = moderate use; Dotted shading = minor use; Unshaded = few or no reports of use

"Pig" names

"Sow-pig" and "chucky-pig" from North Devon are apparently exclusive to the county with, at the back of the latter the name "choogy", a predominantly West Country children`s word for a pig as in the Somerset nursery rhyme, recited by an adult when taking each of the child`s toes one by one:

This choogey-pig went to market.
This choogey-.pig stayed at home…....

Choogey is onomatopoeic, echoing calls to pigs along the lines of choogey, chook and chuck (this last also a call to fowls hence "chucky-hen"). According to In Herefordshire the names "chooky pig" and its variant "choogy pig" were used for woodlice. In line with these usages is "jacky-pig" as a woodlouse name where evidence from elsewhere shows that "jack" is a call to pigs.

In relation to the name "pig louse" from East Devon, it seems that the variant "pig`s louse" is more common and has also been recorded from Somerset. In this case, rather than referring to pigs it might refer to pig-lice (hog lice) (*Haematopinus suis*), a widespread and well-known parasite of both domestic and wild pigs. These animals are large enough to be easily seen with the naked eye (4-6mm) though only about a third of the size of an adult *Porcellio scaber*.

"Granfer" as in "granfer-grig", on the face of it has little to do with pigs, literally meaning "grandfather" recorded from both Devon and Somerset. However, in Hampshire "granfer" also had a different sense, meaning "the smallest pig in the litter; a pig brought up by hand". If it seems reasonable that this meaning had wider currency at one time, it is possible to see how it became transferred to woodlice. This can then give us "granfer-pig" and "gramma-zow" of which the latter is also known from Cornwall (from Dorset there is the name "grammer-pig"). Apparently there is recorded a rhyme from Wiltshire (no doubt once more widely known) and was sung by children holding in their hand a woodlouse and trying to charm it into curling up:

Granfer Grig killed a pig,
Hung un up in corner;
Granfer cried and piggy died,
And all the fun was over.

"Tiddy-hog" means small pig. St Anthony`s pig or Anthony pig was a widespread expression for the smallest pig in the litter, the favourite one, dedicated to and under the special protection of that saint, the patron saint of swineherds (see above). Another name with religious connotations, recorded once in Devon, "parson`s pig", apparently once referred not to the smallest but the fattest pig (apparently a bitter memory of tithing).

"Carpenter" and "Slater" names

Eleven names in Laver`s table (just over 6%) are of the "carpenter" type, a name for woodlice also recorded in Shropshire and Warwickshire. "Cafender" is a south-western variant of carpenter and could also refer to woodlice. Apparently a Newfoundland word for woodlouse is "carpenter" or "cafner" (another is also "boat-builder"). These names clearly relate to the animals` affinity to wood as will "carpenter`s flea", "wood-pig", "wood-bug", "grampus wood-bug" and, of course "woodlouse". The significance of "grampus" i.e. walrus is obscure (unless, of course, it is a corruption of "granfer").

The same sort of anthropomorphism we find in "carpenter" could inform "slater" from being found under slates. "Sheel-back", presumably relating to "shell-back", as well as being purely descriptive might be an allusion to a person, a "shell-back" being, in nautical colloquialism, "a sailor of full age, especially if tough and knowledgeable". "Shoe-maker" might be a similar sort of pun pointing to the trade of shoe-making or alternatively the somewhat shoe-like shape of a woodlouse on its back and about to roll into a ball.

"Pill bugs" & similar

The term "pill-bug" and related names have already been alluded to above in relation to medicinal pills but "billy-button", "William-button" and "curly-button" clearly are descriptive names as is "cruller" which literally means "curler" (cf "crilly-greens" = curly greens from North Devon). "Cobber" possibly relates to a "cob" which can be small and round, "pea-bug" obviously to its shape (a name I also recall from a childhood in Kent). Cheese-bug is said to relate to a round Dutch cheese (as also the Hampshire "cheese pill" and the Norfolk "cheese-bob" – I have certainly heard the word

"cheesy-bob" in Devon) but equally could be connected with the cheesy smell of aggregated woodlice (Paul Harding, pers.comm.).

"Chizzle-ball" apparently relates also to "chissel-bob" (Isle of Wight), "chizzle-bob" (Berkshire) and "chesil-bob" (Hampshire) which seem to be corruptions of "cheslop(pe)" which has been variously recorded as a translation of "porcelet de S.Antoine" or of the French "cloporte". The latter is a combination of clore (to close) and porte (door) and there are similar expressions in other languages, including an English "lock-door". Interestingly English compounds for woodlice generally seem to relate to closing a chest rather than a door.

The name "fuzzy-pig" appears not to derive directly from the concept of pig but to hedgehog which, of course rolls up into a ball (other Westcountry names include vuzz-pig and vuz-a-boar – the fuzz/vuzz is gorse = furze; I can recall a Devon lady saying "*Uzz calls it vuzz!*"). Analagous is "guinea-pig", known also from Wiltshire.

Crawlers and others

"Crawlers", "flat-backs" and "hard-backs" could be purely descriptive although the possibly obsolete slang word "crawler" meant "louse, maggot, nit". "Flat-back" has been used elsewhere as a slang word for bed-bug. "Coffin-cutter" could relate to the propensity to inhabit rotten wood although, interestingly the same word has been recorded in Northern Ireland for the staphylinid *Ocypus olens* (devil`s coach-horse or cocktail). As with "pig`s louse", "carpenter`s flea" and "cheese-bug", insects have clearly played a noticeable if not major role in woodlouse naming.

Puzzling names

There are some Devon woodlouse names that remain puzzling. "Snot", although referring to nasal mucus is also a dialect word for the squashy fruit of yew (Smith, 2008) but it could be a variant of "snob", a word used in Herefordshire (and elsewhere) for a cobbler. "Bibble-bug" might conceivably be a corruption of "bible-back", an expression (with connotations of blackness) for a hump-back or a person with round shoulders or maybe because it was sometimes found under or associated with the big bible in a church. On the other hand, the south-western verb "to bibble" meaning to drink or tipple might relate to its tendency to occur in damp or moist places.
"Rollinto ball" / "roll into balls" is apparently straightforward although it might, perhaps, have been a description rather than a name. Presumably "tank" is a neologism relating to its armour-plating.

CONCLUSIONS

The Devon papers have shown us not only something of the number and diversity of vernacular names for woodlice but how much variation there is even within a single (albeit large) English county. It would be interesting to look at similar studies for other parts of the country although now, with much improved mobility, there are likely to be many more cases like the Kingsbridge "chuggy-pig" where "incomers" have brought in their own names. The other factor clearly making such studies more difficult is the standardization of language where "woodlouse" is well understood everywhere and the "old names" die out through lack of use for not being understood and as being perceived as unfashionable. It is fortunate that the Devon studies were done at a time when many people could still remember the older names although, as can be seen below, they are not all dead yet and it would be interesting to collect more samples like that one.

POSTSCRIPT: AN EXPERIMENT

During an exhibition at Plymouth University during Insect Week in March 2012, visitors were asked what names they knew for woodlice and what area they came from. This was to see what traditional names were remembered and to try to localize them.

30 people completed the questionnaire & results were as shown. Although clearly not a scientifically collected sample the responses do give an indication that at least some of the old names are still remembered. One wonders how many generations must pass until these are only found in books on folklore and everyone refers only to "woodlice".

What I call them	Where I come from
Woodlice	Plymouth, Hampshire, Callington (Cornwall)
Chuggy pigs	Plymouth
Carpenter`s bugs	Plymouth
Pea bugs	Hampshire, Kent, Plymouth
Pill bugs	Hampshire, Plymouth, Kent, Somerset
Hardy backs	Northumberland, Plymouth
Wood mice	Plymouth (child)
Cheesy bugs	Kent, Berkshire
Penny pigs	Essex
Tanks	Black Country
Chuckywigs	West Yorkshire
Chuckybacks	West Yorkshire
Granfer grigs	South Devon
Chucky pigs	Plymouth
Rolly Polly	Plymouth (USA)
Cheese log	Bristol
Pellet bugs	Buckinghamshire
Beetles	Buckinghamshire – the roll-up ones
Wood pigs	Plymouth, South Devon
Slaiter	Dumfries
Sow pigs	Nr Truro (Cornwall)

ACKNOWLEDGEMENTS

I am most grateful to Paul Harding for putting me on the trail of the Collinge references, for providing me with copies of the latter's published and unpublished notes, also with the information relating to Herefordshire dialect as noted in Leeds (1985) and for other helpful comments. Also to Plymouth City Library and the National Marine Biology Library, Plymouth for access to various references.

REFERENCES

Buczaki, S. (2002) *Fauna Britannica.* London: Hamlyn.

Chater, A.O. (1988) Woodlice in the cultural conciousness of Europe. *Isopoda* **2**: 21-39.

Collinge, W.E. (1917) Folk-lore and Local Names for Woodlice. *Nature, London*. **100**: 105.

Collinge, W.E. (1935) Woodlice, their Folk-lore and Local Names. *Northwestern Naturalist* **10**: 19-21.

Collinge, W.E. (1946) *An Introduction to the Terrestrial Isopoda (woodlice) of the British Isles.* (unpublished)

Laver, F.J.M. (1989) Some regional variations in our "Demshire Mouthspaich". *Rep.Trans.Devon.Ass.Advmt.Sci.* **121**: 15-35.

Leeds,W. (1985) *Herefordshire Speech: a companion to the dialect of Herefordshire and the Borders*. Leominster, ARCH.

Moore, G.F. (1965) 69th Report on Dialect. *Rep.Trans.Devon.Ass.Advmt.Sci.* **97**: 116-118.

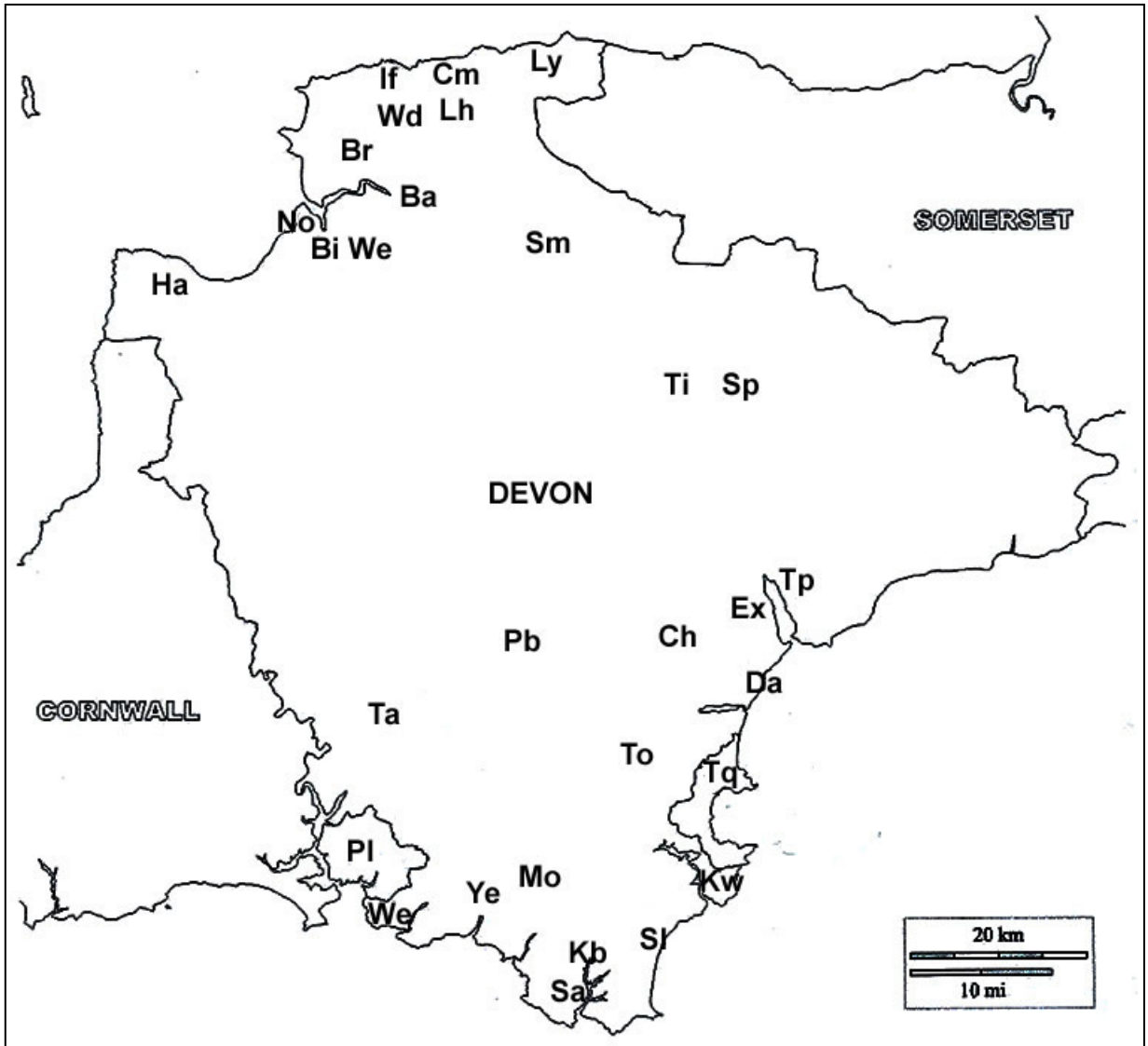
Opie, I. & Opie,P. (1997) *The Oxford Dictionary of Nursery Rhymes*, new edition. Oxford: Oxford University Press.

Schmallfuss, H. (1984) Eco-morphological strategies in terrestrial isopods. *Symp.Zool.Soc.London* **53**: 49-63.

Smith, J.B. (2008) From *Granfer-Grig* to *Tiddly-Tope*: A look at names for representatives of the natural world in the Laver corpus. *Rep.Trans.Devon.Ass.Advmt.Sci.* **140**: 157-184.

Udagawa, T. (1989) Names for terrestrial isopods in Japan. *Isopoda* **3**: 9-12.

APPENDIX I: DEVON SHOWING LOCATIONS REFERRED TO BY MOORE (1965) AND BUCZAKI (2002)



Ba = Barnstaple	If = Ilfracombe	Pl = Plymouth	To = Totnes
Bi = Bideford	Kb = Kingsbridge	Sa = Salcombe	Tq = Torquay
Br = Braunton	Kw = Kingswear	Sl = Slapton	Wd = West Down
Ch = Chudleigh	Lh = Loxhore	Sp = Sampford Peverell	We = Wembury
Cm = Combe Martin	Ly = Lynton	Sm = South Molton	Wl = Westleigh
Da = Dawlish	Mo = Modbury	Ta = Tavistock	Ye = Yealhampton
Ex = Exminster	Pb = Postbridge	Ti = Tiverton	
Ha = Hartland	No = Northam	Tp = Topsham	

APPENDIX II: WOODLICE NAMES BY (A) PARISHES AND (B) AREAS AS COLLECTED BY MOORE (1965)

[E] = East, [N] = North & West, [S] = South

a) Parishes

Barnstaple[N]	chuggy-pig	**Lynton** [N]	sowey-pig
	sow-pig	**Modbury** [S]	granfer-grig
Bideford[N]	chuggy-pig	**Northam** [N]	chuggy-pig
	sow-peg	**Plymouth**[S]	carpenter
	snot	**Salcombe**[S]	carpenter
Braunton[N]	chuggy-pig	**Sampford Peverell**[E]	pig-louse
Chudleigh[S]	guinea-pig	**Slapton**[S]	shoe maker
	sow-pig	**S.Molton**[N]	chuggy-pig
Combe Martin[N]	chuggy-pig	**Tiverton**[E]	sowey-pig
Dawlish[S]	sow-pig		tiddy-hog
	carpenter	**Topsham**[E]	gramfer-grig
Hartland[N]	chicky-pig	**Totnes**[S]	carpenter
Ilfracombe[N]	chuggy-pig	**Torquay**[S]	granfer-grig
Kingsbridge[S]	chuggy-pig	**West Down**[N]	sow-pig
Loxhore[N]	criller		chuggy-pig
Postbridge[N]	sow-pig	**Westleigh**[N]	chuggy-pig

b) Areas

Bideford Area [N]	**Kingswear Area** [S]	**Tavistock Area** [S/W]	**Totnes Area** [S]
billy-button	billy-button	billy-button	granfer-grig
chucky-pig	carpenter	carpenter	pig
chuggy-pig	carpenter`s flea	cheese-bug	sow-pig
hardy-back	cobber	chookie-pig	wood-pig
sow-pig	granfer	gammer-zow	
	pig	grammer-zow	
	slater	granfer-grig	
Exminster Area [E]	sow-pig	grannypicker	
curly-button	St.Anthony`s pig	hard-back	
grampus		roltintoball	
wood-bug	**Modbury Area** [S]	slater	
pig	carpenter	soda-pig	
sour-bug	gramma-zow	sow-pig	
sow-pig	pig	William button	
	sow-pig	wood-bug	

MISCELLANEA

ISOPOD POEM FOUND BY PETER NICHOLSON

By Walter Garstang (1868-1949) "Larval Forms and other Zoological Verses", Oxford, Blackwell (1951).

ISOPOD PHYLOGENY

SING a song of six legs, a new phyletic stage!
Four and twenty Isopods cradled in a cage:
When the cage was opened, out they ran to play—
Wasn't it a jolly thing to have a jolly day!

Mother rocked the cradle between her stegopods:
The youngsters ran about her seven pereiopods:
When they found she'd one pair more than they themselves,
They called a hasty conference on oöstegal shelves.

MacBride[1] was in his garden settling pedigrees,
There came a baby Woodlouse and climbed upon his knees,
And said: ' Sir, if our six legs have such an ancient air,
Shall we be less ancestral when we've grown our mother's pair? '

1922 (or earlier).

[1] cf. *Textbook of Embryology*, 1914: ' They (i.e. the larvae of *Portunion*) resemble the young of normal Isopods when they leave the brood-pouch, and not even the most determined opponent of the recapitulation theory could deny their ancestral significance,' p. 219.

45

FIELD MEETING REPORTS

REPORT ON BMIG FIELD MEETING AT STAINBOROUGH, BARNSLEY, 2012

J. P. Richards

Dept of Animal & Plant Sciences, University of Sheffield, Western Bank, Sheffield, S10 1UN, UK. Email: paul.richards@sheffield.ac.uk

INTRODUCTION

The annual general meeting and field meeting of the British Myriapod & Isopod Group was held at Wentworth Castle, Stainborough, Barnsley, South Yorkshire from 13-15th April 2012.

Figures 1-3 show records from the Sheffield database and demonstrate the paucity of local records for Barnsley (top centre of map) prior to the BMIG meeting. Rotherham and Doncaster have only partially been mapped. The large accumulation of records in north Sheffield are the result of a specific recording project, Street Safari in 2007 (Clegg & Richards, 2007).

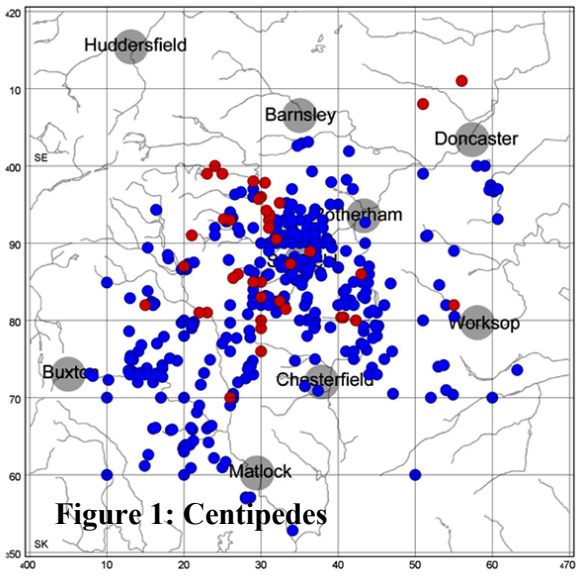


Figure 1: Centipedes

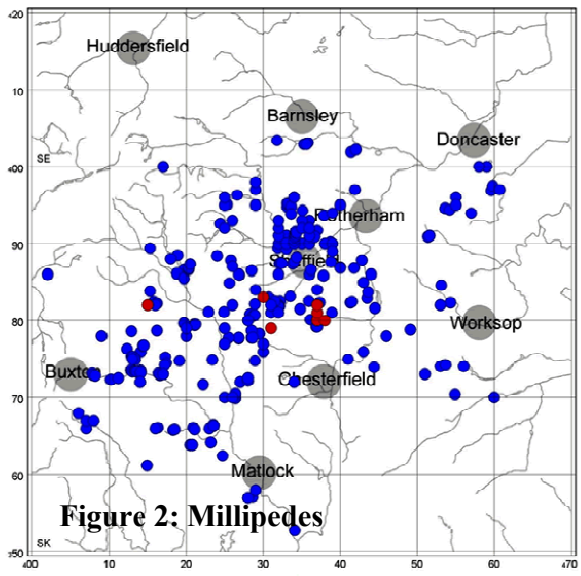


Figure 2: Millipedes

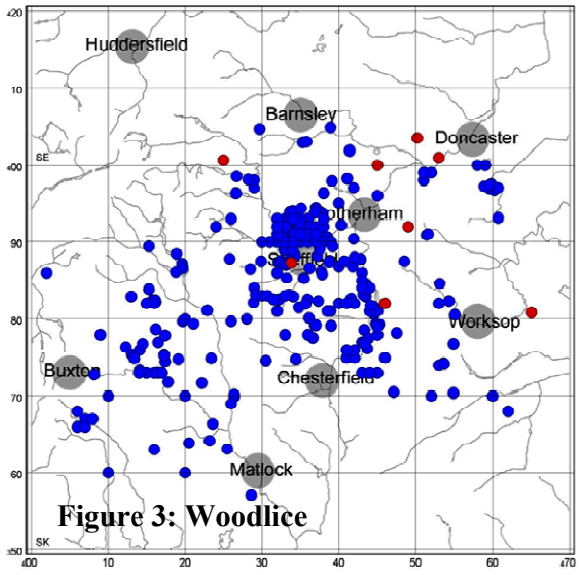


Figure 3: Woodlice

FIGURES 1-3: Previous records for the Sheffield area

● - pre-1990 records
● - records from 1990 onwards

A total of 607 records were reported from: Keith Alexander, Tony Barber, Mike Davidson, Jim Flanagan, Steve Gregory, Desmond Kime, Paul Lee, Angela Lidgett, Keith Lugg, Helen Read, Paul Richards, Duncan Sivell, Mark Telfer, Ashley Watson & Derek Whiteley. 28 one kilometre grid squares (monads) were visited across Barnsley Metropolitan District and adjacent areas of South Yorkshire (see Table 1).

TABLE 1: Summary of sites visited during BMIG field meeting to Barnsley, 2012

Site name	Grid reference
Dunford Bridge	SE1502
Trans Pennine Trail, Wogden bottom	SE1602
Little Don Valley/Langsett Reservoir	SE1900
Whitely edge	SE1904
Ingbirchworth	SE2105; 2106; 2006
Langsett	SE2200
Clough Wood, Gunthwaite	SE2406
Cannon Hall Country Park	SE2707
Menagerie Wood, Bretton Park	SE2812
Stainborough Park/ Wentworth Castle	SE3102 to 3303
Trans Pennine/Dove Trail, Barnsley	SE3403
Barnsley Canal, Wilthorpe	SE3408
Stairfoot, Ardsley	SE3705; 3706
Edderthorpe Ings	SE4107
Upper Haigh Wood	SE4208
Goldthorpe	SE4703
Brockadale YWT Reserve	SE5017; 5117
Broomhead Reservoir	SK2696
Stocksbridge	SK2698

There is a diversity of habitats across the district including upland heath, blanket bog, ancient woodland, post-industrial brownfield sites, restored wetlands and grazing marsh (see SY timescape, 2007). The geology is predominantly Coal measures and Millstone grit sandstones. The limited natural provision of calcareous habitat is slightly balanced by the influence of many restored rail and industrial synanthropic sites that are available, offering sporadic alkaline, calcium rich environments.

RESULTS

The venue for the meeting, Wentworth Castle and in particular the walled garden and plant nursery, was by far the most productive site, providing 39 species of the 54 recorded across the district (see Tables 2-4).

This recording effort produced records for at least 22 new species of myriapod and terrestrial isopod to the Barnsley area in what was previously a very under-recorded area. The Sorby Record Special publication, *Millipedes, Centipedes & Woodlice of the Sheffield Area* (Richards, 1995) is the nearest published record of recent information from these groups, but the maps finish at the SE00 line just below Barnsley. The datasets for the area just north of this line are very limited indeed, with records for only 25 species from these groups.

Therefore, the field meeting has established a good foundation for future recording in the Barnsley area by adding a significant amount to local knowledge for these groups. The weekend produced a good range of species, many of which are new to the current datasets. These have made a valuable contribution to establishing context to the north of what is otherwise a very well recorded area. The more interesting species are discussed below.

Centipedes

The wealth of new centipede records was very welcome (Table 2), with 5 new species to the Barnsley area, including the very widespread *Haplophilus subteranneus* (Fig. 4) and *Lithobius melanops*, which show clearly how under-recorded the area has been. There are a few scattered localities elsewhere around Sheffield for *Lithobius macilentus*, with a typically parthenogenetic distribution of localized clusters of records (Richards 1995). It remains to be seen if the two new Barnsley sites represent equally isolated populations. The two westerly upland sites for *Lithobius calcaratus* mirror other local records. This small, dark species is very much a moorland and heath resident, which will no doubt prove to be much more common when these habitats are investigated more closely in the region. The other new species was *Schendyla nemorensis*.

FIGURE 4: *Haplophilus subterraneus*, a centipede new to the Barnsley area
(image © Paul Richards)

Millipedes

Among the millipedes (Table 3), the most significant records were for *Choneiulus palmatus*, from Wentworth Castle gardens, which was previously not known locally (Richards, 1995). Interestingly, *Leptoiulus belgicus* was not found in this location during the BMIG meeting, but had been found in good numbers quite recently at the same site as another new species to the region (Richards 2010). Other significant millipedes included *Melogona gallica* from Langsett, which is only the third local record and one of very few outside the south and west of Britain. Three of the locally scarce *Brachychaeteuma bradeae* were found around Wentworth castle. *Brachyiulus pusillus* (Fig. 5) is also a very uncommon species around Sheffield, with only three sites noted in Richards, 1995, but two new South Yorkshire sites were identified. The very productive Wentworth site also turned up a single record of *Cylindroiulus vulnerarius*. This species has a strong affinity with mature gardens locally and was not unexpected in the heavily managed grounds of the castle.

FIGURE 5: *Brachyiulus pusillus*, an uncommon millipede in the Sheffield area
(image © Paul Richards)

Woodlice

Despite the slightly larger dataset in local record centres for woodlice compared to the myriapods, the expansion in local knowledge was quite notable (Table 4). No *Armadillidium* species had previously been recorded for Barnsley, but 3 were encountered during the field meeting. *Armadillidium nasatum* was picked up around Wentworth Castle. This species is scarce in the Sheffield area and only known from synanthropic, urban sites.

Armadillidium pulchellum was a surprising find in the post-industrial Dearne valley at Edderthorpe. In the region, this species is widespread on the Carboniferous limestone of the Peak District and is tentatively assumed to have been introduced here in chippings associated with the railways and mining operations.

Armadillidium vulgare was less surprising at Brockadale, just to the east of the Barnsley district, on the band of Permian limestone, where it is widespread, but uncommon. Another species found only at Brockadale was *Platyarthrus hoffmannseggii* which has a very specific local distribution down the Permian limestone belt (Richards 1995) as part of the most northerly inland population for this species (Gregory 2009). Another species associated with limestone, *Porcellio spinicornis* occurred in the walls of Wentworth castle gardens and on the disused railway at Stairfoot but is not known from any more 'natural' habitats locally, outside the limestone areas of the Peak District.

Other than within the grounds of Wentworth Castle, it would seem that dung heaps and compost heaps were not well surveyed during the meeting. *Porcellionides pruinosus* was recorded here and from a dung heap at Whitely edge. The other dung specialist, *Porcellio dilatatus* was not recorded at all, but is known from a single Barnsley farm-yard site, not far from Wentworth. A recent unpublished survey of stables and dung heaps around Sheffield has shown both species to be widespread in other parts of South Yorkshire and Derbyshire.

A scarcity of specialist recording has produced an inaccurate picture for the distributions of the small pale *Haplophthalmus* species. Both local species were found at Wentworth Castle and the disused railway at Wogden. *Haplophthalmus danicus* (Fig. 6) was also found at Brockadale and *H. mengii* at

Gunthwaite. All the *H. danicus* sites are calcareous, either naturally or through human influence, while Gunthwaite is more naturally acidic on coal measures.

FIGURE 6: *Haplophthalmus danicus* – this woodlouse was found at four sites.
(image © Paul Richards)

The close attention of BMIG has also added *Trichoniscus pygmaeus* to the Barnsley list, at Dunford Bridge and Wogden. This is a hugely under-recorded species, which is widespread in urban areas across Sheffield and particularly frequent in the limestone of the Peak District.

ACKNOWLEDGEMENTS

In addition to the above mentioned recorders, thanks are extended to the Yorkshire Wildlife Trust for access to their reserves, Jim Flanagan for assistance with site permissions and Derek Whiteley at Sheffield City Ecology Unit for records and maps for Barnsley sites. Particular thanks go to Peter Clegg for assistance with arranging accommodation at Stainborough and providing access to all areas of the park.

REFERENCES

Clegg, P & Richards, J.P. (2007) Street Safari: recording myriapods and isopods as part of a community project in Sheffield *Bulletin of the British Myriapod & Isopod Group* (2007) **22:** 36-43.

Gregory, S.J. (2009) *Woodlice and Waterlice (Isopoda:Oniscidea & Asellota) in Britain and Ireland.* Centre for Ecology & Hydrology/Field Studies Council.

Richards, J.P. (2012) Millipedes, Centipedes & Woodlice of the Sheffield Area. *Sorby Record Special Series* **10**. Sorby Natural History Society/Sheffield City Museum.

Richards, J.P. (2010) *Leptoiulus* in Yorkshire. *Newsletter of the British Myriapod and Isopod Group* **21:** 2-3 (*unpublished*).

SY timescapes (2007) http://www.sytimescapes.org.uk/files/uploads/pdfs/zonemaps/BarnsleyZones.pdf

TABLE 2: Number of records of Centipede species recorded during BMIG field meeting to Barnsley, 2012

Grid Ref: / Species	SE1502	SE1602	SE1900	SE1904	SE2006	SE2105	SE2106	SE2200	SE2406	SE2707	SE2812	SE3102	SE3103	SE3202	SE3203	SE3302	SE3303	SE3403	SE3408	SE3705	SE3706	SE4107	SE4208	SE4703	SE5017	SE5117	SK2696	SK2698	**TOTAL**
Haplophilus subterraneus													3					1		1								1	**6**
Schendyla nemorensis			1				1						2								1								**5**
Strigamia acuminata																									1				**1**
Geophilus easoni			3																				1						**4**
Geophilus flavus			4		1		1																						**6**
Geophilus insculptus		1	2					1	3				2		1						1						2		**13**
Geophilus truncorum			4		1	2	1	1	3											1		1	1	1	1		2		**19**
Cryptops hortensis													6		2						1	1		1					**11**
Lithobius calcaratus			3	2																									**5**
Lithobius crassipes				1			1		2														1						**5**
Lithobius forficatus		3	6	2	1		2		6				5		4		1		1	1	1	2	1	1		1	1		**39**
Lithobius macilentus		1							1																				**2**
Lithobius melanops									1				3		2		1												**7**
Lithobius microps			1			1	1		1				1		1						1	1			1				**9**
Lithobius variegatus	1	2	8	1	1	2	2	2	7		1	1	4	1	1		1	1	1	1	2		1				2		**43**

TABLE 3: Number of records of Millipede species recorded during BMIG field meeting to Barnsley, 2012

Species \ Grid ref:	SE1502	SE1602	SE1900	SE1904	SE2006	SE2105	SE2106	SE2200	SE2406	SE2707	SE2812	SE3102	SE3103	SE3202	SE3203	SE3302	SE3403	SE3408	SE3706	SE4107	SE4208	SE5017	SE5117	SK2696	TOTAL
Glomeris marginata		3						1	4				1				1		2			1	1	2	**16**
Brachychaeteuma bradeae													2	1											**3**
Melogona gallica								1																	**1**
Melogona scutellaris																								1	**1**
Nanogona polydesmoides		1						1	1				2							1	1	1		1	**9**
Brachydesmus superus			1	1		1	1	1	2				1									1	1		**10**
Polydesmus angustus			3	1					1				2	1								1	1	1	**11**
Polydesmus coriaceus		1		1			1	1	2				9	3											**18**
Polydesmus inconstans				1		1																	1		**3**
Archiboreoiulus pallidus														1											**1**
Blaniulus guttulatus								2					4	1								1			**8**
Boreoiulus tenuis																				1					**1**
Choneiulus palmatus													1	3											**4**
Nemasoma varicorne			1						1															1	**3**
Proteroiulus fuscus		3	6		1	1	1	1	3	1			5	1							2	1		2	**28**
Brachyiulus pusillus													2									1			**3**
Cylindroiulus britannicus				2					1				8	3											**14**
Cylindroiulus caeruleocinctus													1									1			**2**
Cylindroiulus punctatus	1	2	7			1	2	2	8			1	7	6	1	1		2	1		1	1		2	**46**
Cylindroiulus vulnerarius														1											**1**
Julus scandinavius			2					1	2				1								1			1	**8**
Ommatoiulus sabulosus																							1		**1**
Ophyiulus pilosus									1				6	2				1				1			**11**
Tachypodoiulus niger	1	3	6	1		1	1		6	1	1		4	4	1	1	1	1	2	1	2	1	1	1	**41**

TABLE 4: Number of records of Woodlouse species recorded during BMIG field meeting to Barnsley, 2012

Grid ref: / Species	SE1502	SE1602	SE1900	SE1904	SE2006	SE2105	SE2106	SE2200	SE2406	SE2707	SE2812	SE3102	SE3103	SE3202	SE3203	SE3302	SE3403	SE3408	SE3706	SE4107	SE4208	SE5017	SE5117	SK2696	TOTAL
Androniscus dentiger	1	3											3		1					1					**9**
Haplophthalmus danicus		1											3		3							1			**8**
Haplophthalmus mengii		1							1				1		1										**4**
Trichoniscus pusillus agg.	1	1	3	2	1	1	1	1	2				3				1	2	1		1	1		1	**23**
Trichoniscus provisorius													1												**1**
Trichoniscus pusillus s.str.		2	2						4				1		3										**12**
Trichoniscus pygmaeus	1	1							1				1												**4**
Oniscus asellus	1	4	7	1	1	1	1	1	6		1		8	1	3	1	1	2	2	1	1		2	1	**47**
Philoscia muscorum		1						1	3		1	1	7		3	1	1	1	2	1	1		2	1	**27**
Platyarthrus hoffmannseggii																							1		**1**
Porcellio scaber		1	3	1	1	1	1	2	3	1		1	7	1	4	1				2	1		1	1	**33**
Porcellio spinicornis													4		2				1						**7**
Porcellionides pruinosus				1									3		2										**6**
Armadillidium nasatum													1		2										**3**
Armadillidium pulchellum																				1					**1**
Armadillidium vulgare																							2		**2**

REPORT ON THE BMIG FIELD MEETING IN KENT 2011

Paul Lee[1], A. D. Barber[2] and Steve J. Gregory[3]

[1] Little Orchard, Bentley, Ipswich, Suffolk IP9 2DW, UK.
E-mail: arachne2222@aol.com

[2] Rathgar, Exeter Road, Ivybridge, Devon PL21 0BD, UK.
E-mail: abarber159@btinternet.com

[3] 200 Ock Street, Abingdon, Oxfordshire OX14 5DR, UK.
E-mail: stevejgregory@btopenworld.com

INTRODUCTION

The 2011 BMIG field weekend, held from 14th to 17th April, was based at the University of Kent at Canterbury. The county has been extensively recorded for myriapods and isopods over the last century and in his introductory talk Eric Philp presented attendees with a species list for Kent along with a challenge to add even a single species so confident was he of the effort that had gone in to ensuring that recording in the county was comprehensive. However, the main purpose of this meeting, one for which a Defra grant had been awarded through Hymettus, was a systematic survey for what were then UK BAP species, the millipedes *Polyzonium germanicum* and *Metaiulus pratensis* both of which are Kent specialities.

Late thirteenth century archaeological deposits from Stonar (north of Sandwich) provide the earliest woodlouse record from Kent in the form of calcified remains of *Porcellio laevis* (Girling, 1979).

George Newport (1803 – 1854), one of the pioneers of myriapod studies in Britain, was born at Canterbury and published important papers on these animals between 1841 and 1856. His original description of *Lithobius melanops* was based on specimens actually collected by him from a garden at Sandwich in 1842. Other familiar species he described were *Lithobius pilicornis*, *Lithobius emarginatus* (*Lamyctes emarginatus* from New Zealand), *Cryptops anomalans* and *Geophilus vesuvianus* (*Henia vesuviana* from near Naples), all of which have been subsequently found in Kent.

The millipede *Cylindroiulus caeruleocinctus* was first recorded in Britain from near Sevenoaks (Pocock, 1900). Many of the myriapod and isopod records from the first half of the twentieth century originate from studies at the South-eastern Agricultural College in Wye and were often published in the journal of that organisation. For example, Theobald records the occurrence of *Blaniulus guttulatus* and *Geophilus flavus* in a study of damage caused to hop plants (1912). The arrival of the Brade-Birks at Wye was significant, not only in its impact on knowledge of the county's fauna (Brade-Birks & Brade-Birks, 1918), but that of Britain as a whole.

It was Rev. Stanley Brade-Birks who described *Archiboreoiulus pallidus* as a species new to science from a runner bean plot at the College (Brade-Birks, 1920b) and reported *Polyzonium germanicum* (Brade-Birks, 1920a) and *Stosatea italica* (Brade-Birks, 1922) as species new to Britain from sites in Kent. He almost certainly found the first British examples of *Lithobius muticus* in woodland at Wye (Notebook entry 3061, 8.10.20, "teste Ribaut & Brolemann" as he put it – both thought it was probably this species) but this record remained unpublished. Sholto Rolfe also used his time at Wye to publish a series of *Notes on Diplopoda* (Rolfe 1934, 1935, 1936, 1937, 1938 1939). In 1934 he was the first to note the presence of *Propolydesmus testaceus* in Kent, a species only recorded once previously in Britain, under stones in a chalk pit at Wye and in allotment gardens in Folkestone (Rolfe, 1935). In the chalk pit at Wye it was associated with *Brachydesmus superus*, *Brachyiulus pusillus* and the first British specimens of *Leptoiulus kervillei* (Blower & Rolfe, 1956).

Five years later Wye produced another species new to science when specimens of an unknown Julid millipede were collected with samples of hops. The species was described under the name *Metaiulus pratensis* and in the next couple of decades was recorded widely in Kent during wireworm sampling of recently disturbed grassland and collecting by Brade-Birks (Blower & Rolfe, 1956).

Various workers were recording in Kent in the second half of the twentieth century resulting in further notable discoveries. Lewis (1962) collected one of the earliest British specimens of *Geophilus fucorum seurati* from Whitstable and *Miktoniscus patiencei* was first collected in Britain from the Medway estuary in 1971. The latter went unrecognised for 5 years as the specimen was female and its identity was not established until 1976 when further specimens were collected in Cornwall and the Isle of Wight (Harding & Sutton, 1985). Harding & Sutton (1985) also reported the first Kent and second British site for *Eluma caelata* discovered at Herne Bay in 1980. *Lithobius peregrinus* was an unexpected addition to the British fauna when a colony was found at Sheerness (Barber & Eason, 1986) and when Tony Barber collected *Lithobius lapidicola* at Sandwich Bay in 1988 (Barber 1992) it was the first outdoor record of the centipede in Britain. Eric Philp, Adrian Rundle and Des Kime also contributed significantly to our knowledge of myriapods and isopods in the county through the latter part of the twentieth century.

METHODS AND SITES

Fieldwork during the BMIG field meeting in 2011 was a little more structured than has been the norm. All sites where the millipede *Polyzonium germanicum* had been recorded were identified and additional sites where the millipede might occur, mainly woodlands, were then identified with help from Kent Wildlife Trust. Over 50 sites in 26 different 10km squares were identified in total (see Table 1). KWT also assisted with gaining permission to visit these sites, many of them with no public access. Permission was obtained to visit other sites in the ownership of Natural England, RSPB, Sussex Wildlife Trust and the Woodland Trust. Packs containing site maps, record details where relevant and recording sheets were prepared for each site. In addition to any sites they chose to visit for their own interests, attendees were requested to visit at least one or two of the sites on each field day (15th and 16th April) and to follow a standardised protocol to search for *P. germanicum*. This involved recording the number of animals collected in 30 minutes hand searching in a 20m x 20m sample area. Rather than collecting for 30 minutes in one spot, six locations within the sample area were searched for 5 minutes each. Litter type, depth and moisture and vegetation structure and bare ground cover were recorded from each area.

Six local wildlife sites in the Medway valley were identified as potential habitat for *Metaiulus pratensis* and for field visits by a reduced number of BMIG members on 17th April (see Table 1). Steve Gregory, Paul Lee and Helen Read stayed on to record further sites on 18th and 19th April.

MILLIPEDES

The millipedes recorded from each of the sites visited are shown in Table 2. In total there were 26 species reported but no more than 9 species from any one site and none were recorded from two of the sites. Several species, not just the Nationally Rare and Nationally Scarce as one might expect but also some widespread and common species, were reported from just one of the sites visited. However, varying numbers of members were on each site for different periods of time, as is usually the case during BMIG meetings, so most of the recording was not standardised and there is limited value in a simple comparison of species richness.

TABLE 1: Details of recording locations / sites visited and recorders

Recorders: Keith Alexander (KA), Tony Barber (TB), Kevin Clements (KC), Mike Davidson (MD), Jim Flannagan (JF), Steve Gregory (SJG), Steffen Grossmann (SSG), Ken Hill (KH), Liz Joyce (LJ), Des Kime (RDK), Angela Lidgett (AL), Paul Lee (PL), Peter Nicholson (PN), Eric Philp (EP), Helen Read (HR), Paul Richards (JPR), Duncan Sivell (DS), Josh Jenkins-Shaw (JJS), Mark Telfer (MT).

Site code	Location	Grid reference	VC	Date(s)	Recorder(s)
1	The Moor, Hawkhurst	TQ7529	15	16.iv.2011	MT
2	Collingwood, Hawkhurst	TQ7629	15	16.iv.2011	RDK, JPR, MT
3	The Gill, Goudhurst	TQ7238	16	16.iv.2011	RDK, JPR, MT
4	Wilden Wood (Widehurst Wood)	TQ7541	16	18.iv.2011	PL, HR
5	Wilden Wood (Widehurst Wood)	TQ7542	16	18.iv.2011	SJG
6	Snoad Wood (Widehurst Wood) (Fig. 3)	TQ7641	16	18.iv.2011	SJG, PL, HR
7	Darnold Wood / Brick Kiln Wood	TQ7648	15	16.iv.2011	HR
8	Darnold Wood / Brick Kiln Wood	TQ7649	15	16.iv.2011	MD, JF
9	Quarry Wood, West Farleigh	TQ7152	15	18.iv.2011	SJG, PL, HR
10	Honeyhills Wood	TQ7956	15	16.iv.2011	MD, JF
11	Honeyhills Wood	TQ8056	15	16.iv.2011	HR
12	Burham Down	TQ7362	15	16.iv.2011	MD, JF, HR
13	Westfield Wood	TQ7560	15	16.iv.2011	MD, JF, HR
14	Flatropers Wd, Peasmarsh	TQ8623	14	16.iv.2011	SJG, PL
15	Potman's Heath	TQ8728	15	16.iv.2011	JPR, MT
16	College Wood, Wittersham	TQ8926	15	--.iv.2011	RDK
17	Moor Wood, Iden Green	TQ8031	15	18.iv.2011	SJG, PL, HR
18	Wattle Wood, Tenterden	TQ8735	15	16.iv.2011	SJG, PL
19	Dering Wood (West)	TQ8944	15	15.iv.2011	KA, LJ, AL
20	Smokes Wood, Hucking Estate	TQ8457	15	16.iv.2011	TB, KC
21	Kiln Wood, Lenham	TQ8851	15	16.iv.2011	TB, KC
22	Motney Hill, Rainham	TQ8267	15	17.iv.2011	JPR
23	Stockbury Hill Wood	TQ8360	15	16.iv.2011	TB, KC
24	Queendown Warren	TQ8363	15	16.iv.2011	TB, KC
25	Orchard Wood	TQ9026	15	16.iv.2011	JPR
26	Luckhurst Wood	TQ9327	15	15.iv.2011	KA, LJ, AL
27	Ash Wood	TQ9328	15	15.iv.2011	KA, LJ, AL
28	Stone Wood, Shadoxhurst	TQ9636	15	15.iv.2011	KA, LJ, AL
29	Kingsland Wd, Shadoxhurst	TQ9637	15	15.iv.2011	KA, LJ, AL
30	Longrope Wood	TQ9835	15	15.iv.2011	KA, LJ, AL
31	Dering Wood (East)	TQ9044	15	15.iv.2011	KA, LJ, AL
32	Hothfield Heathlands	TQ9645	15	15.iv.2011	PL
33	Hothfield Heathlands	TQ9745	15	15.iv.2011	PL
34	Ashford Warren (West)	TQ9944	15	15.iv.2011	SJG
35	Wichling Wood, Torry Hill Estate	TQ9155	15	15.iv.2011	PL

36	Kennelling Wood	TQ9551	15	16.iv.2011	SJG
37	Spuckles Wood, Stalisfield Green	TQ9552	15	16.iv.2011	PL
38	Denge Wood, Garlinge Green	TQ9952	15	15.iv.2011	RDK
39	Cromers Wood, Sittingbourne	TQ9060	15	15.iv.2011	TB
40	Packing Wood, Hamstreet	TR0035	15	16.iv.2011	EP
41	Stockshill & Blackthorn Woods, Aldington	TR0635	15	16.iv.2011	KA, LJ, AL
42	Ashford Warren (East) (Fig. 4)	TR0044	15	15.iv.2011	MD, HR
43	Soakham Downs, King's Wood	TR0249	15	15.iv.2011	MD, SJG, HR
44	Wye Downs NNR	TR0745	15	15.iv.2011	MD, SJG, HR
45	Park Wood, Chilham	TR0452	15	15.iv.2011	EP
46	Boughton Street	TR0759	15	14.iv.2011	SJG, HR
47	Broadham Down, Chilham	TR0852	15	15.iv.2011	DS
48	Julliberie Down, Chilham	TR0853	15	15.iv.2011	DS
49	Denstead Wood	TR0857	15	15.iv.2011	EP
50	South Blean Woods, Dunkirk	TR0858	15	17.iv.2011	JPR
51	Denge Wood, Garlinge Green	TR0952	15	15.iv.2011	JPR
52	Denstead Wood	TR0956	15	15.iv.2011	PN
53	Victory Wood / Blean Wood	TR0860	15	14.iv.2011	SJG, HR
54	Victory Wood, Dargate	TR0861	15	15.iv.2011	SSG, KH, DS
55	N. Bishopden Wood, Blean Woods NNR	TR0960	15	15.iv.2011	TB
56	Folks Wood, Lympne	TR1335	15	16.iv.2011	KA, LJ, AL
57	Brockhill Country Park, Pedlinge	TR1435	15	16.iv.2011	KA, LJ, AL
58	Spong Wood	TR1245	15	15.iv.2011	KC, PL
59	Yockletts Bank	TR1247	15	16.iv.2011	EP
60	Elham Park Wood	TR1545	15	15.iv.2011	RDK, JPR
61	Denge Wood, Garlinge Green	TR1052	15	15.iv.2011	JF, JPR
62	Thanington roadside	TR1256	15	15.iv.2011	EP
63	Church Wood, Rough Common	TR1259	15	15.iv.2011	PN, EP
64	University of Kent, Canterbury	TR1459	15	15.iv.2011	SJG
65	Denstroude	TR1061	15	15.iv.2011	DS
66	Thornden Wood	TR1463	15	14.iv.2011	PL
67	East Blean Wood NNR	TR1964	15	14.iv.2011	PL
68	Sladden Woods	TR2542	15	15.iv.2011	JF, RDK, JPR
69	Pitt Wood, Addisham	TR2252	15	15.iv.2011	JF, RDK, JPR
70	Bishopstone Glen, Herne Bay	TR2068	15	16.iv.2011	EP
71	Stodmarsh NNR	TR2260	15	15.iv.2011	JF, RDK, JPR
Medway Valley sites for *Metaiulus pratensis* survey					
72	Yalding Fen	TQ6849	16	17.iv.2011	KA, SJG, PL, HR
73	Golden Green	TQ6242	16	19.iv.2011	SJG
74	Holborough Marshes, Snodland	TQ7062	16	19.iv.2011	SJG, PL
75	Abbey Mead Lakes, Snodland	TQ7161	15	17.iv.2011	SJG, PL

The only standardised recording was that carried out for *Polyzonium germanicum* (Fig. 1). The ecological data collected are to be reported in a separate paper, however, the intensive recording effort involved the collection of data from 92 samples across 51 sites. The millipede was found in 22 of these samples at 17 sites in 16 different 10km squares across much of East Kent (VC15). An apparent decline in the range of *P. germanicum* was what had led to it being listed as a UK BAP priority species in 2007 and subsequently as a s41 species and was the reason it was one of the target species for the meeting.

The records from the meeting suggest that this apparent decline was an artefact probably caused by a reduction in recording effort. *P. germanicum* was first recorded at Wye in 1919 (Brade-Birks, 1920a) but not from elsewhere in Kent until 1950. Even as recently as 1960 the millipede was known from just four hectads. Then over the next three decades the number of records of the species went up by more than 500% and the known distribution expanded to 12 hectads, presumably in part due to the establishment of the Millipede Recording Scheme in 1970 but also due to a succession of active recorders working in the county; E.G. Philp throughout the period, A.D. Barber and R.D. Kime in the 1960s and 1970s, K.C. Side in the 1970s and P. Lee and A.J. Rundle in the 1980s. There were no further records submitted to the recording scheme after 1989 most likely because the county was assumed to have been well recorded and effort was focussed elsewhere.

Not only is there no evidence of a decline as *P. germanicum* survives throughout its known historical range but the records from the meeting extended its known distribution both eastwards and westwards. There are few suitable sites further east but it may still occur unnoticed in other areas to the west of the county.

FIGURE 1: ***Polyzonium germanicum*** **was frequently recorded**
(image © Paul Richards)

The apparent widespread distribution of *Metaiulus pratensis* in Kent at the time of its description (Blower & Rolfe, 1956) appears to have been followed by a gradual decline until it was last seen in the Medway valley near Maidstone in 1988. This is a very rare animal in Europe and combined with the apparent decline, even fear it may have gone extinct in the UK, led to its designation as a UK BAP priority species in 2007 and subsequently as a s41 species. Although the rediscovery of *M. pratensis* had been hoped for when planning the meeting it was a surprise to find it in large numbers at Yalding Fen (Fig. 2), the first site visited specifically to search for the species. This success led those who found the species (S.J. Gregory, P. Lee and H.J. Read) to believe they understood its

habitat requirements but they could not locate it at any of the other sites visited, even Holborough Marshes which appeared very suitable. There is a need for further work, not just a new survey for *M. pratensis* but also a study of the ecology of the Yalding Fen population.

FIGURE 2: *Metaiulus pratensis* was found in good numbers at Yalding Fen
(image © Paul Richards)

In addition to the work on *P. germanicum* and *M. pratensis*, four Nationally Scarce species, *Brachychaeteuma melanops, Stosatea italica, Leptoiulus kervillei* and *Allajulus nitidus*, were recorded. Both *L. kervillei* and *S. italica* were originally reported in the UK from Kent and the county is still the stronghold for *S. italica*. Therefore it was surprising that during the BMIG meeting it was reported only from the University campus where we were based in Canterbury. However, many past records of the species were from disturbed or synanthropic sites which were not the main focus of the collections at the meeting and in addition it seems to be intermittent in its occurrence at known sites (almost always from calcareous soils which drain rapidly).

FIGURE 3: Snoad Wood (site 6), Steve Gregory collating field notes (image © Helen Read)

Table 2: List of millipede species recorded by location (details in Table 1) during BMIG meeting in Kent in April 2011

MILLIPEDES																									
Location	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**
Glomeris marginata	●	●	●	●		●	●	●	●	●	●	●	●	●			●	●	●	●			●	●	●
Polyzonium germanicum		●	●			●													●		●				
Brachychaeteuma melanops									●																
Brachydesmus superus															●										●
Polydesmus angustus			●							●			●					●							●
Polydesmus coriaceus			●			●			●																●
Ophyiulus pilosus			●															●							
Leptoiulus kervillei																		●							
Cylindroiulus caeruleocinctus																						●	●	●	
Cylindroiulus punctatus			●	●	●	●	●	●		●			●	●		●	●	●	●	●	●		●	●	
Brachyiulus pusillus															●										
Tachypodoiulus niger			●			●		●	●	●			●	●			●		●	●	●	●		●	
Location	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
Glomeris marginata	●	●	●		●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
Polyzonium germanicum					●				●								●				●	●			
Chordeuma proximum									●																
Melogona scutellaris											●														
Brachydesmus superus	●												●												
Polydesmus angustus				●					●				●	●											
Polydesmus denticulatus									●	●															
Proteroiulus fuscus																		●							
Julus scandinavius			●				●																		
Ophyiulus pilosus													●					●							
Leptoiulus kervillei											●						●		●						
Allajulus nitidus															●										

Location (cont.)	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Cylindroiulus londinensis									●								●		●						
Cylindroiulus punctatus			●	●			●		●	●	●		●	●	●	●	●	●	●		●			●	
Tachypodoiulus niger			●	●	●	●			●	●			●			●	●	●	●		●				
Location	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**	**73**	**74**	**75**
Glomeris marginata		●	●			●	●	●	●	●	●		●		●	●	●	●	●						
Polyzonium germanicum				●	●	●		●					●		●	●			●		●				
Brachychaeteuma melanops																							●		
Melogona scutellaris																			●						
Stosatea italica														●											
Brachydesmus superus						●				●								●				●	●	●	●
Polydesmus angustus			●		●		●				●		●			●		●	●			●		●	
Polydesmus coriaceus															●				●			●	●		●
Polydesmus inconstans																						●			
Macrosternodesmus palicola																		●							
Ophiodesmus albonanus																		●							
Proteroiulus fuscus						●									●						●				
Blaniulus guttulatus																								●	
Julus scandinavius																●									
Ophyiulus pilosus	●		●						●									●	●	●				●	
Leptoiulus kervillei						●																			
Metaiulus pratensis																						●			
Allajulus nitidus										●	●														
Cylindroiulus britannicus																					●	●			
Cylindroiulus caeruleocinctus																								●	
Cylindroiulus londinensis												●													
Cylindroiulus punctatus		●	●		●	●		●		●			●			●		●				●			
Brachyiulus pusillus																						●		●	●
Tachypodoiulus niger			●				●	●	●			●		●				●	●			●			

Table 3: List of centipede species recorded by location (details in Table 1) during BMIG meeting in Kent in April 2011

CENTIPEDES																									
Location	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**
Strigamia acuminata								●	●				●	●											
Strigamia crassipes													●							●				●	
Strigamia maritima																						●			
Schendyla nemorensis		●																		●					
Geophilus easoni			●		●	●											●				●				
Geophilus flavus					●	●		●	●	●		●		●							●		●	●	
Geophilus truncorum					●	●			●	●			●	●			●	●		●				●	
Henia brevis												●													
Cryptops hortensis		●							●					●			●	●							
Lithobius curtipes					●																				
Lithobius forficatus		●	●		●			●	●	●		●	●	●	●		●	●			●		●	●	
Lithobius macilentus																	●								
Lithobius microps				●																	●				
Lithobius muticus			●			●		●						●			●								
Lithobius variegatus				●	●	●		●	●	●	●		●	●			●	●	●	●	●		●	●	●
Location	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
Strigamia crassipes									●		●	●													
Schendyla nemorensis				●	●													●	●		●				
Haplophilus subterraneus								●													●				
Geophilus easoni					●				●							●					●				
Geophilus flavus					●				●	●	●			●				●	●		●				
Geophilus truncorum									●		●	●		●				●			●				

Location (cont.)	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Cryptops hortensis									●					●				●			●			●	
Cryptops anomalans															●										
Lithobius borealis										●															
Lithobius curtipes				●																					
Lithobius forficatus									●					●		●	●	●	●		●	●		●	
Lithobius macilentus		●																							
Lithobius microps												●							●						●
Lithobius muticus											●							●							
Lithobius variegatus			●	●	●	●		●	●		●	●	●	●		●	●	●	●	●	●	●			●
Location	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**	**73**	**74**	**75**
Strigamia acuminata																		●							
Schendyla nemorensis			●		●																				
Haplophilus subterraneus												●													
Geophilus easoni			●		●					●						●									
Geophilus flavus			●		●	●							●		●		●		●			●	●	●	●
Geophilus truncorum			●		●												●							●	
Cryptops hortensis			●			●									●		●								
Cryptops anomalans														●											
Lithobius calcaratus																	●								
Lithobius crassipes																●									
Lithobius curtipes															●										
Lithobius forficatus			●		●							●	●	●	●			●	●			●	●	●	
Lithobius microps					●			●							●	●								●	
Lithobius muticus			●																						
Lithobius variegatus			●		●	●		●		●	●	●		●	●	●									

Table 4: List of woodlice species recorded by location (details in Table 1) during BMIG meeting in Kent in April 2011

WOODLICE																									
Location	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**
Ligidium hypnorum		●	●		●	●			●	●				●				●							
Haplophthalmus danicus		●							●									●							
Haplophthalmus mengei ss																		●							
Trichoniscus pusillus agg.		●	●	●	●	●	●	●	●	●	●	●	●	●			●	●	●	●	●		●	●	●
Trichoniscus pygmaeus									●																
Philoscia muscorum	●	●			●	●	●	●	●			●	●	●			●	●	●	●	●		●	●	●
Oniscus asellus			●		●	●	●	●	●	●		●	●	●			●	●	●	●	●		●		
Armadillidium nasatum																						●			
Armadillidium vulgare	●									●		●	●									●	●	●	●
Eluma caelata															●							●			
Porcellio dilatatus	●																								
Porcellio scaber	●	●			●	●			●			●		●			●	●	●	●	●		●	●	
Trachelipus rathkii															●										
Location	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
Ligidium hypnorum									●		●				●			●						●	
Haplophthalmus danicus									●		●								●						
Trichoniscus pusillus agg.	●	●	●	●	●	●			●	●	●	●			●	●	●	●	●	●	●				●
Philoscia muscorum	●	●	●	●	●	●			●	●	●	●			●	●	●	●	●		●	●		●	●
Oniscus asellus	●	●	●	●		●		●	●		●	●				●	●	●	●	●	●	●		●	●
Armadillidium vulgare		●			●						●					●			●	●		●		●	●
Porcellio scaber	●	●			●	●			●	●	●	●				●	●	●	●	●	●	●		●	

Location	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Ligidium hypnorum	●		●							●	●			●				●		●			●	●	
Androniscus dentiger																									●
Haplophthalmus danicus														●				●				●			●
Metatrichoniscoides leygidii																									●
Trichoniscus pusillus agg.			●			●		●	●		●		●	●	●	●	●	●				●	●	●	●
Trichoniscus pygmaeus																									●
Trichoniscoides albidus																						●			
Trichoniscoides sarsi																									●
Philoscia muscorum	●		●			●		●	●	●	●		●	●	●	●	●	●	●	●		●	●	●	●
Oniscus asellus	●		●			●		●	●	●		●	●	●		●	●					●	●	●	●
Platyarthrus hoffmannseggii																								●	
Armadillidium nasatum																									●
Armadillidium vulgare									●		●			●	●					●		●	●	●	●
Eluma caelata				●																					
Porcellio scaber			●			●	●	●	●		●	●	●	●	●		●					●	●	●	●
Trachelipus rathkii																						●		●	

CENTIPEDES

The centipedes recorded from each of the sites visited are shown in Table 3. Although centipede recording was not one of the principal aims of the meeting, a number of interesting observations were made.

In total 20 species were reported from the meeting, four of which have the status of Nationally Scarce. Both *Henia brevis,* the only geophilomorph in this group, and *Lithobius macilentus* were reported from East Kent (VC 15), the former from only a single location at Burham Down and the latter from Moor Wood and Ash Wood. *L. muticus* was more widespread with records from East Kent (Brick Kiln Wood, Wattle Wood, Kennelling Wood, Soakham Downs, Blean Woods) and West Kent (The Gill, Snoad Wood) as well as East Sussex (Flatropers Wood). The final member of this group, *L. curtipes*, was also widespread with records from woodlands in East Kent (Kingsland Wood, Denstroude) and West Kent (Widehurst Wood) and more frequent than *L. crassipes,* the common small, woodland species in much of Britain but only recorded from Thornden Wood in NE Kent during the meeting. It does seem that, although, in terms of identification, these two species can sometimes be difficult to separate, their ecology is probably somewhat different (see, for instance, Roberts, 1956, Vaitilingham, 1960, Barber & Keay, 1988).

The first outdoor record of *L. lapidicola*, a Nationally Rare species, in the UK was from the seaward edge of the golf links at Sandwich Bay but the site was not revisited and the species was not seen during the meeting. Very surprisingly, *L. melanops* generally a common species and another first recorded in the UK from Kent, was not seen at any of the sites during meeting but it does tend to be a species of gardens, disturbed and synanthopic sites and the coast. A number of other species previously recorded from Kent were not found during this survey; *Geophilus osquidatum*, *Geophilus carpophagus s.s.*, *Geophilus electricus*, *Geophilus alpinus*, *Stenotaenia linearis*, *Cryptops parisi*, *Lamyctes emarginatus* and *Lithobius pilicornis* many of which have distinctly synanthopic tendencies. Others, referred to above, are *Lithobius lapidicola*, *Lithobius peregrinus* and *Geophilus fucorum seurati* (*L. peregrinus* is probably now extinct in its one urban site). The house centipede, *Scutigera coleoptrata*, has also been found more than once in the county.

FIGURE 4: Lunch at Ashford Warren (site 42). Left to right, Ken Hill, Jim Flanagan and Mike Davidson (image © Helen Read)

WOODLICE

A total of 18 species of woodlice were recorded from 67 sites during the meeting. The woodlice recorded from each site are shown in Table 4.

The ubiquitous woodlice *Trichoniscus pusillus* agg., *Philoscia muscorum*, *Oniscus asellus* and *Porcellio scaber*, not unexpectedly, were seen in good numbers at most sites. The only other frequently recorded species were *Armadillidium vulgare* (26 sites), *Ligidium hypnorum* (22 sites) and *Haplophthalmus danicus* (10 sites). *L. hypnorum* proved to be quite widespread not only within woodland, but also on shady river-side meadows, a reflection of the relative abundance of this 'continental' species in south-eastern England (Gregory, 2009).

The remaining species were recorded from between one and three sites. These were not just the more uncommon British woodlice as one might expect, but also some widespread and common species, such as Rosy Woodlouse *Androniscus dentiger* and Ant Woodlouse *Platyarthrus hoffmannseggii* (both recorded from single sites). This is perhaps due to the fact that recording of woodlice was not one of the principal aims of the meeting. None-the-less a number of interesting observations were made. The Nationally Scarce *Eluma caelata* was recorded from three sites and Kent remains the British stronghold for this species. Another species with a south-eastern bias in Britain, *Trachelipus rathkii*, was found at three sites in the Medway Valley and the Rother Levels. Also of interest is the discovery (by MT) of *Porcellio dilatatus* on waste ground under brick beside a shed in the village of The Moor. Although likely to be considerably under-recorded in Britain due to its penchant for 'unsavoury' manure heaps, it may occasionally be found in gardens, compost heaps, etc (Gregory, 2009).

The discovery of the small pallid trichoniscid woodlouse *Metatrichoniscoides leydigii* at Abbey Mead Lakes near Snodland is very significant, not only because it was the first time the species had been found in Kent. This species was first recorded in Britain in 1989 from among compost-rich gravel and rubble at a garden centre in Oxford (Gregory, 2009) and was almost certainly unintentionally introduced to this site (e.g. via plant material). One of us (SJG) collected a single male *M. leydigii* from the underside of a piece of concrete embedded into peaty soil on the edge of a reedbed bordering the River Medway (Gregory, 2012).

It is also very significant that two specimens of *Trichoniscoides sarsi* were collected nearby from beneath stones below strandline debris on the banks of the Medway. In Britain, *T. sarsi* is generally associated with synanthropic sites, such as old gardens or churchyards, (Gregory, 2009) and it is widely perceived to be a well-established non-native. However, in the Netherlands, where both species are native, *T. sarsi* is a frequent associate of *M. leydigii* (Berg *et al.*, 2008) and the Medway site is very similar in nature to the native habitat described for both species in the Netherlands. It is plausible that the Medway site supports a native population of both species, rather than a recent human-aided introduction. If this is so then *M. leydigii* should be considered Nationally Rare in the UK and *T. sarsi* should be Nationally Scarce.

ACKNOWLEDGEMENTS

Thanks to Keith Alexander, Tony Barber, Kevin Clements, Mike Davidson, Steve Gregory, Steffen Grossman, Liz Joyce, Angela Lidgett, Peter Nicholson, Eric Philp, Helen Read, Paul Richards, Duncan Sivell and Mark Telfer for submitting their records.

Greg Hitchcock of the Kent Wildlife Trust gave invaluable assistance, not just in arranging access to KWT reserves but he also in provided details of local wildlife sites. He was able to obtain

permission to visit many of these sites and assisted with researching ownership of other sites that had been identified as potentially interesting. Graeme Lyons of the Sussex Wildlife Trust arranged permission for recording in Flatropers Wood and the Natural England Regional Office assisted with requests to record on Wye Downs and Stodmarsh NNRs.

REFERENCES

Barber, A.D. (1992) *Lithobius lapidicola* Meinert, 1872 in Britain. *Bulletin of the British Myriapod Group*, **8**: 25-30.

Barber, A.D. & Eason, E.H. (1986) A redescription of *Lithobius peregrinus* Latzel, a centipede new to Britain (Chilopoda, Lithobiomorpha). *Journal of Natural History*, **20**: 431-437.

Barber, A.D. & Keay, A.N. (1988) *Provisional Atlas of the Centipedes of the British Isles.* NERC, Huntingdon.

Berg, M.P., Soesbergen, M., Tempelman, D. & Wijnhoven, H. (2008). *Verspreidingsatlas Nederlandse landpissebedden, duizendpoten en miljoenpoten*. EIS-Nederland, Leiden.

Blower, J.G. & Rolfe, S.W. (1956) *Metaiulus pratensis*, gen. et sp. nov. and *Leptoiulus kervillei* (Brölemann), (Diplopoda, Iulidae), from Britain. *Annals and Magazine of Natural History*, (Ser.12), **9**: 513-520.

Brade-Birks, H.K. & Brade-Birks, S.G. (1918) Notes on Myriapoda - XIII. Some Kent records: With special reference to luminous forms, and with Lancashire and Cheshire comparisons. *Lancashire and Cheshire Naturalist*, (Dec. **1918**): 1-22.

Brade-Birks, S.G. (1920a) Notes on Myriapoda XXI: Colobognatha, an order of diplopods new to Britain represented by *Polyzonium germanicum* (Brandt). *Annals and Magazine of Natural History*, (Ser.9), **5**: 198-200.

Brade-Birks, S.G. (1920b) Notes on Myriapoda XXIV: Preliminary notes on a millipede new to science. *Annals and Magazine of Natural History*, (Ser.9), **6**: 364-365.

Brade-Birks, S.G. (1922) Notes on Myriapoda XXVI: The names of some Iulidae and Blaniulidae. *Annals and Magazine of Natural History*, (Ser.9), **9**: 160-163.

Girling, M.A. (1979) Calcium carbonate-replaced arthropods from archaeological deposits. *Journal of Archaeological Science*, **6**(4): 309-320.

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.

Harding, P.T. & Sutton, S.L. (1985) *Woodlice in Britain and Ireland: distribution and habitat*. Huntingdon: Institute of Terrestrial Ecology.

Lewis, J.G.E. 1962. The ecology, distribution and taxonomy of the centipedes found on the shore in the Plymouth area. *Journal of the Marine Biological Association of the United Kingdom* **42**: 655-664

Pocock, R.I. (1900) On two English millipedes (*Iulus londinensis* Leach, *Iulus teutonicus* sp. n.). *Annals & Magazine of Natural History*, (Ser.7), **6**: 206-207.

Roberts, H. (1956) *An ecological survey of the arthropods of a mixed beech-oak woodland with particular reference to the Lithobiidae*. PhD Thesis, University of Southampton. (*unpublished*)

Rolfe, S.W. (1934) Notes on Diplopoda I. The Re-study of a widely distributed British Millipede, *Ophyiulus pilosus* (Newport). *Annals & Magazine of Natural History*, (Ser.10), **14**: 192-203.

Rolfe, S.W. (1935) Notes on Diplopoda II. On one of the rarer of the British Polydesmidae (*Polydesmus testaceus* C.L.Koch). *Annals & Magazine of Natural History*, (Ser.10), **15**: 284-290.

Rolfe, S.W. (1936) Notes on Diplopoda III. Short notes on three injurous millipedes recently observed. *Journal of the South-Eastern Agricultural College, Wye, Kent*, **34**: 258-259.

Rolfe, S.W. (1937) Notes on Diplopoda IV. The recognition of some millipedes of economic importance. *Journal of the South-Eastern Agricultural College, Wye, Kent*, **40**: 99-107.

Rolfe, S.W. (1938) Notes on Diplopoda V. The recognition of some millipedes of economic importance II. *Journal of the South-Eastern Agricultural College, Wye, Kent*, **42**: 214-215.

Rolfe, S.W. (1939) Notes on Diplopoda VI. The recognition of some millipedes of economic importance III. *Journal of the South-Eastern Agricultural College, Wye, Kent*, **44**: 180-181.

Theobald, F.V. (1912) Animals injurious to Hops. *Journal of the South-Eastern Agricultural College, Wye, Kent,* **21**: 164-168.

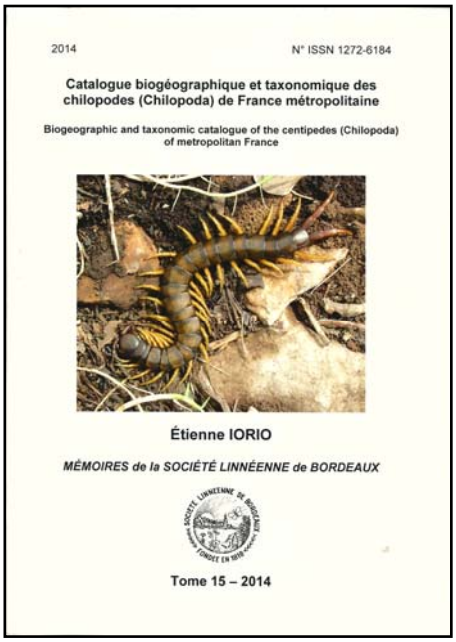
Vaitilingham, S. (1960) *The ecology of the centipedes of some Hampshire woodlands.* MSc Thesis, University of Southampton *(unpublished*).

BOOK REVIEWS

CATALOGUE BIOGÉOGRAPHIQUE ET TAXONOMIQUE DES CHILOPODES (CHILOPODA) DE LA FRANCE MÉTROPOLITAINE

Biogeographic and taxonomic catalogue of the centipedes (Chilopoda) of Metropolitan France.

Etienne Iorio. *Mémoires de la Société Linnéenne de Bordeaux.* Tome 15 – 2014. €25.



Pp. 1 – 372; in French with an introduction in English. Colour plates of selected species and distribution maps by départements.

Reference has already been made in a recent *BMIG Newsletter* (Barber, 2015) to this account of the French centipede fauna (including that of Corsica) which seems, to a substantial extent, replace both H.W.Brölemann`s *Chilopodes* in the *Faune de France* series (1930) as the standard account of the chilopod fauna of that country and the chilopod section of *Les Mille-pattes* of J.-M.Demange (1981). However, what this volume does not contain is either keys or descriptions of the species. For the French Lithobiomorpha, the author has already published an admirable illustrated dichotomous key with a tabular summary of characteristics (Iorio, 2010) and, with J.-J. Geoffroy, accounts of the Scolopendromorpha (Iorio & Geoffroy, 2008, etc.). The latter have also written on the geographical distribution of *Scutigera coleoptrata* (Iorio & Geoffroy, 2007) so that for the present, only the Geophilomorpha of that country lack an adequate modern key; Demange`s account of the centipedes is very largely a copy of that of Brölemann. For those wishing to refer to it, Brölemann`s work is now available on line at: www.faunedefrance.org/bibliothequevirtuellenumerique.

Following the introductory material is a section on "généralités, écologie et éthologie" – soil arthropods, abiotic & biotic factors, reproductive strategies, phenology, altitudinal distribution, vertical distribution in soil & litter, temporal occurrence in habitats, prey, predators and parasites, principal habitats and their species cohorts, the importance of microhabitats for chilopods and the possibility of centipedes as good bio-indicators. Two pages on references for identification and on capture methods are followed by a list of départements with the authors who have recorded any species from each. The list of nearly 150 valid species recorded from France (including Corsica) contains one scutigeromorph (*Scutigera coleoptrata*), 68 lithobiomorphs (of which two are henicopids), ten scolopendromorphs (two *Scolopendra*, eight *Cryptops* species) and 68 geophilomorphs from six families. This compares with not much more than 50 species recorded from Britain and is accounted for by the much greater area, climatic and altitudinal range and diversity of habitats of France (along with the fact that Corsica is included).

Following the accounts of species there is a list of endemic (28), sub-endemic (32) and "locally endemic" (29) species and of the numbers of species recorded for each department, of which the greatest is 69 for Alpes-Maritimes. The author then divides the country into regions and their species cohorts: Continental, Atlantic, Alpine, Pyreneean, Mediterranean. He also lists some 19 species "sensibles" i.e. sensitive / under threat. The series of distribution maps by département shows areas from which the species has been recorded since 1980, those with pre-1980 records only, those from which a record is uncertain or doubtful and those pre-1980 records where, despite searches, the

species not been rediscovered and where it is potentially extinct or in decline in the département concerned. Although, in some ways, it might have been helpful for these maps to be included with each species account, having them all together makes comparison easier.

The species accounts make up the bulk of the book and include, in many cases, introductory notes e.g. on nomenclature followed by an account of the wider distribution together with notes on the ecology including a table of main habitats from which it has been recorded. This is followed by a département by département listing with locations and references and one finds oneself dipping into these reports, not just for their general interest, but for comparison of what we know about the species in Britain and Ireland. For instance, we see *Lithobius tricuspis*, which in Britain is mostly known only from South Devon and South Wales, occurring in pre- and post-1980 records across most of France from south to north and from east to west and *L. piceus* which we know from SE England and South Wales similarly. *L. forficatus*, not unexpectedly occurs right across the country (doubtful in Corsica), *L. pilicornis* only, it seems in the north-west and south and *L. variegatus* very much on the western fringe with records from only four departments.

Lithobius erythrocephalus is shown to be doubtfully or pre-1980 from the extreme south-east, tending to confirm its doubtful occurrence in Britain but, unexpectedly, *L. borealis* is reported from only nine départements despite being widespread in Britain and *Henia brevis* from only from Alpes-Maritimes and Corsica.

A book to look into and to return to, not only if collecting species in France, but for giving a wider perspective to our own fauna both in similarities and differences and for insights into issues relating to the centipede fauna of both countries such as rarity status and threats (as well as comparative ecology, etc.).

Tony Barber

REFERENCES

Barber, A.D (2015) *British Myriapod & Isopod Group Newsletter*, **No. 30**, Spring 2015.

Brölemann, H.W. (1930) *Eléments d`une faune des myriapodes de France. Chilopodes. Faune de France 25*. Imprimerie Toulousaine, Toulouse; P.Lechevalier, Paris.

Demange, J.-M. (1981) *Les Mille-pattes Myriapodes. Generalities, Morphologie, Écologie, Éthologie. Determination des Espèces de France*. Editions Boubée, Paris.

Iorio, E. (2010) les Lithobies et genres voisins de France (Chilopoda, Lithobiomorpha). Révision de plusiers espèces méconnues et nombresapports inédits à la connaissance du genre *Lithobius* Leach, 1814. Avec une clé des familles, des genres et toute les espèces de l`ordre. *Supplément à Revue de l`Association Roussillonaise d`Entomologie*, **19**: 1-104.

Iorio, E. & Geoffroy, J.-J. (2007) Répartition géographique de *Scutigera coleoptrata* (Linne, 1758) en France (Chilopoda, Scutigeromorpha, Scutigeridae) en France. *Le Bulletin d`Arthropoda* **30**: 48-59.

Iorio, E. & Geoffroy, J.-J. (2008) Les scolopendromorphes de France (Chilopoda, Scolopendromorpha): identification et distribution géographique des espèces. *Riviera scientifique* **91** (2007): 73-90.

REVIEWS OF THE EBOOKS

The BMIG facebook pages - https://www.facebook.com/BritishMyriapodandIsopodGroup - have attracted a few reviews of the ebooks by Paul Richards which were produced with financial help from the Opal project. Some of which have been reproduced here. If you don't have a copy of these they can be obtained from www.naturebureau.co.uk.

If you like the images on this facebook site, you may also be in interested in the BMIG ebook; "An Introduction to Centipedes, Millipedes & Woodlice". It is a CDROM containing 3 independent guides to each of these groups.

Each book contains an introduction to taxonomy, life histories, collecting and identification, with keys to the most common or distinctive British species. There are over 700 colour photographs and illustrations, which act as a useful complement to the line drawings of the established identification monographs. Image galleries, for the first time also show some of the less common British species.

This unique tool was developed by BMIG as a resource to propagate the study of these animals. It provides a simple stand-alone introduction for beginners to work through and, being digital, can also be used directly as a teaching presentation for small groups and societies. This also enables the guides to be held on a tablet or phone, offering immediate reference to keys and images in the field.

The author Paul Richards says, "I often use the zooming facility on my phone to show details from the ebooks to participants on guided walks. They can't really see the tiny creatures on my trowel but a zoomed in image of *Geoglomeris* or *Trichoniscus* allows them to fully appreciate what they are seeing at the point of discovery".

The set of all three ebooks is available as a download or CD from Nature Bureau for only £13 thanks to support from Opal.

#howcanyoulivewithoutit Ashley Watson

This ebook - actually three books for the price of one - goes a long way towards explaining the natural history, ecology, taxonomy and morphology of the British myriapods & isopods which are ecologically important species. The disk is not intended to provide detailed identifications for all British species in these groups and full keys may be found elsewhere in hardcopy printed publications, and cross reference here. However, the keys and species galleries featured for each group contains the author's excellent colour images of a wide selection of the commoner or more interesting British species, with notes on their identification features. There are also comprehensive sections covering collection and preservation techniques together with illustrative notes on the importance of systematic recording for this very interesting group of invertebrates. Whilst not intended as field-guides these ebooks may be used a visuals when creating Powerpoint presentations. They can also be uploaded to mobile devices like iphones or tablets, where zooming enables the highlighting of microscopic features on for example guided walks.

Although there is a still a preference for the printed word in scientific literature, these ebooks are intuitive and easy to navigate and make a valuable contribution to our knowledge in this area. Entomologists and ecologists alike will benefit with this essential source of data included in their field-kits.

Derek Bateson (Sorby Natural History Society, Sheffield)

CONTENTS

Cover illustration: *Ceratosphys amoena* Ribaut, 1920, male left telopodite, lateral external view.
Cover photograph: *Hylebainosoma nontronensis* Mauriès & Kime, 1999 © Christian Owen

Editors: H. J. Read, A. D. Barber & S. J. Gregory
c/o Helen J. Read, 2 Egypt Wood Cottages, Egypt Lane, Farnham Common, Bucks, SL2 3LE, UK.

ISSN 1475 1739