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Cover illustration: 1st & 2nd pleopods of male *Metatrichoniscoides leydigii* © Steve Gregory

Cover image: Untitled cartoon © Marianne Misioch (see Miscellanea)

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EDITORIAL

The past year has been a busy one for the BMIG and those working on myriapods and isopods in Britain. The two Opal grants (www.opalexplorenature.org) have been completed with the equipment for viewing and photographing specimens under a microscope all purchased and available now for workshops and lectures. It was on view at the field meeting in Yorkshire and was used to take photographs of the centipede *Pachymerium ferrugineum* found by new member Keith Lugg recently (see image). Paul Richards is to be congratulated on completing the e-books which are now available (see notice elsewhere in the Bulletin for details). This fantastic resource can now be used for giving talks and leading identification workshops as well as providing excellent photographs to help when using conventional identification keys. As a consequence of these two grants the BMIG is now well set up for leading events around the country to enthuse and inspire the next generation of myriapodologists and Isopodologists!

The conservation work on *Trachysphaera*, *Metaiulus*, *Polyzonium* and *Nothogeophilus* funded by the Government (DEFRA) is coming to a conclusion. Although *Nothogeophilus* remains elusive, progress has been made on the other species and various reports and papers are currently being written.

This edition of the Bulletin includes information on the woodlice found during the field meeting to Galicia some years ago. Spain continues to be a productive place to look for our groups, although the presence of so many new species makes it challenging in terms of identification and has slowed up the progress of reporting the findings from these visits. We look forward to further updates from Galicia and the Basque Country in due course.

The past year has been a significant one for Myriapodologists outside Britain too. The International Congress of Myriapodology last summer in Australia was clearly a success although sadly the attendance by British workers was unusually low. A significant publication this year has been the first volume of the European atlas of Diplopoda by Desmond Kime and Henrik Enghoff. This impressive piece of work is the culmination of many years of collating and searching for records in published material and chivvying individual workers for the information they have. Both authors are to be congratulated on this amazing achievement. In particular we would like to congratulate Desmond Kime for his dedication to the subject over the years and there is an appreciation of the work that Desmond has carried out elsewhere in this edition; we are very proud that he continues to attend our field meetings when he can.

R. DESMOND KIME – A BIRTHDAY APPRECIATION

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Photo: Paul Richards

Des Kime was a founder member of the British Myriapod Group in 1970 and he is still actively involved with its successor, BMIG. This brief "appreciation" celebrates Des' 80th birthday in April 2012 and the contribution he has made to myriapod studies in Britain and continental Europe. With the full agreement of his family, Des chose to spend this notable birthday at the BMIG Spring Meeting at Wentworth Castle near Barnsley – a true sign of his dedication to myriapodology! Fortunately, BMIG provided birthday cake (see image, left) and a (faltering) round of "Happy Birthday".

Born and brought-up in Lincolnshire, Des' interest in natural history was fostered by his grandfather and he went on to study zoology at the University of Durham, where his post-graduate research on hole nesting birds included work on fleas (Kime, 1962). Since 1968 his main research interest has been in soil fauna, especially millipedes. With a postgraduate Diploma in Education, he went on to teach Biology, Botany and Zoology at the Royal Grammar School in Guildford, where he was joined by fellow teacher Tony Barber in 1964. That led to a division of labour in myriapod fieldwork, with Tony covering the centipedes and Des the millipedes, for recording in grid squares rather than the then traditional vice-counties.

In April 1970, Des and Tony joined 10 other myriapodologists at a field meeting in North Devon, at which the British Myriapod Group was formed (Anon, 1972). The British Myriapod Survey was launched in 1971 by Colin Fairhurst and Tony Barber.

In 1974 Des was appointed to the European School in Brussels, which gave him the opportunity to widen his interests in the ecology and distribution of millipedes in Europe. His work on millipedes was usually confined to his spare time and school holidays, but through active links with museums and university departments, mainly in Belgium and France, Des has been able to collaborate widely, as his publications demonstrate. Since his retirement in 1993, and subsequently going to live permanently in central France, these collaborations have increased and extended. With a natural gift for languages, Des has been in communication with almost every active myriapodologist in Europe.

At the 4th International Congress of Myriapodology at Gargano, Italy in 1978, a decision was made to set up the European Myriapod Survey, modelled on the British Survey. Des was, and remains, the contact point for this project, which has never had any form of official financial support. In his paper

announcing the European Survey (Kime, 1985), some ambitious aspirations were expressed, but by then Des was mapping European distributions of millipedes, by hand, on paper maps. Remember, this was the dawn of computerised information technology in biogeography. I remember seeing piles of "work in progress" maps in Des' study at the top of the house in Linkebeek that he and Kathleen occupied for many years. On each visit, the amount of information had increased and tantalizing distributions were beginning to emerge. Although, interim maps for 50 species were published (Kime, 1990), the difficulties of getting the data from original hand-plotted maps into a form suitable for publication has delayed the project, but it has allowed Des more time to collate records.

Des worked with Henrik Enghoff on the Fauna Europaea project to collate the European list of Diplopoda (Enghoff & Kime, 2004). This led to their further collaboration on the European Atlas, the first volume of which (Kime & Enghoff, 2011) covers 492 species. The subsequent two volumes will cover more than 1000 further species (and the list keeps growing). The Atlas is a magnificent tribute to all concerned, not least to the perseverance of Des Kime in collating records for more than 25 years (and to Kathleen for putting up with it!).

Always affable and ready with an anecdote, Des is excellent and generous company at any time. He has taken part in BMIG excursions to under-recorded parts of Europe – Hungary (Korsos, 2006) and more recently twice to northern Spain and Portugal. His enthusiasm in truly inspirational, as he demonstrated at the recent BMIG meeting with news: of his forthcoming atlas of the millipedes of France, of progress with Volume 2 of the European Atlas, and of prospects for further surveys in Spain. I have had the pleasure of his company at many European Invertebrate Survey and Council of Europe meetings and conferences at various locations on the continent. Des has an unerring eye (and nose) for good food and appropriate alcoholic refreshment. Only once have we been unlucky, in a remote village in Finland where we shared execrable pizzas (the only food available after 6pm) in a gloomy bar full of morose-looking foresters.

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WOODLICE (ISOPODA: ONISCIDEA) COLLECTED FROM NORTHWEST SPAIN AND NORTHERN PORTUGAL IN 2004 BY THE BRITISH MYRIAPOD AND ISOPOD GROUP

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ABSTRACT

In March 2004 members of the British Myriapod and Isopod Group collected woodlice (Isopoda: Oniscidea) from the southern Galician provinces of Pontevedra and Orense and the northern Portuguese distrito of Viana do Castelo. Samples were collected from a variety of locations from low-lying coastal areas to inland habitats up to 800m asl. Although 27 distinct oniscid taxa are recognised, the samples were dominated by five species; *Porcellionides cingendus*, *Porcellio scaber, Eluma caelata, Porcellio debueni* and *Oniscus lusitanus*. 36% of the species recorded are endemic to north-western Iberia, including *Trichoniscoides lusitanus, Miktoniscus bisetosus, Oniscus galicianus, Porcellio dispar* and *Porcellio herminiensis*. Other species collected were generally widespread European species. *Miktoniscus patiencei* and *P. dispar* are reported from Spain for the first time. Three species of *Trichoniscoides* remain undetermined and may be new to science. Outline descriptions of these are given, which should allow any future specimens to be recognised.

INTRODUCTION

In 2004 the British Myriapod and Isopod Group, under the auspices of the European Invertebrate Survey, undertook a short expedition to the north-western part of the Iberian Peninsula. This region was targeted because it was relatively under recorded for millipedes (Diplopoda) and potentially could hold an interesting and possibly endemic fauna. Subsequent descriptions of new species collected by this expedition, such as the glomeridan *Tectosphaera vincenteae* and four species of *Cylindroiulus* millipede (Mauriès, 2005; Read, 2007) supported this view.

Although the sampling effort was directed at millipedes, other taxa, including woodlice (Isopoda: Oniscidea) were also collected. The woodlice of the region are much better known. In the 1930s and 1940s Albert Vandel examined much material from Portugal and he described many new oniscid species, including *Trichoniscoides lusitanus*, *Miktoniscus bisetosus* and *Porcellio herminiensis* (Vandel, 1946). More recently David Bilton has collected in the region, and described additional new species; *Oniscus acarenensis* and *O. galicianus* (Bilton, 1992; 1997). None-the-less, it is probable that much remains to be known about the onscid fauna of this region.

MATERIALS AND METHODS

The aim of the field meeting was to compile as many species records as possible including woodlice. 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 (Fig. 1). The list of the collecting localities is given in Table 1, which includes outline habitat characteristics and grid references.

Surveys were mainly undertaken in semi-natural habitats, including coastal sand-dunes and beaches, woodland (dominated by Oak *Quercus*, Alder *Alnus* or Pine *Pinus*) and upland moorland. A few synanthropic habitats, including gardens, were also sampled. Many of the localities were low-lying,

either coastal (beside the Atlantic Ocean) or within the valley of the Rio Miño (Mhino). Further inland the land rises, and the Puerto de Moncelos (upland moorland, locality 11) rises to 800m asl, while the Portuguese Oak woodlands at Vascões and Castanheira lie at about 500-550m asl.

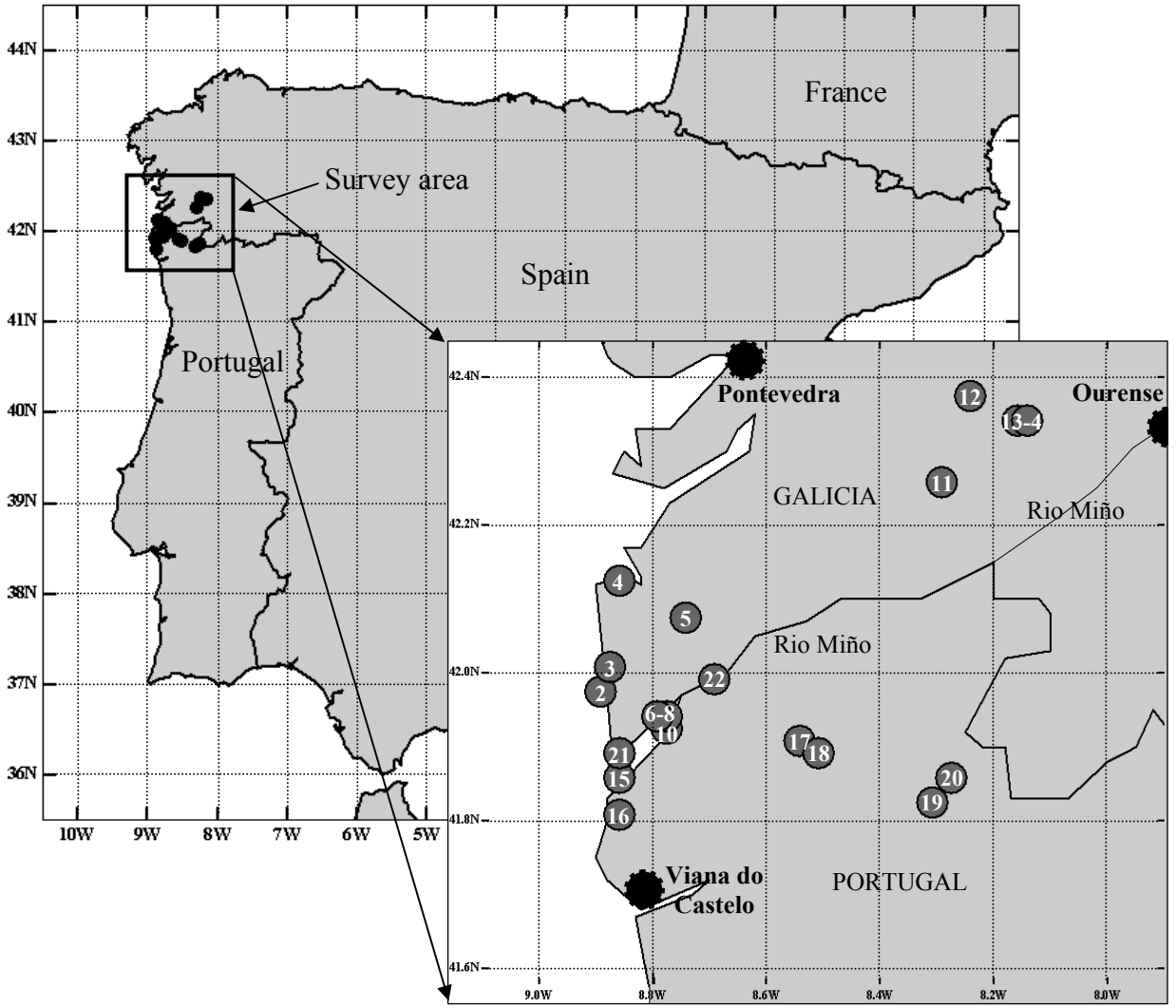

FIGURE 1: Map of Iberian Peninsula indicating survey area (left) and enlargement of survey area (inset right) to show sample sites within Galicia and northern Portugal.
NB: Site 1, Finca Rio Miño, lies within the cluster of sites 6-8.

At most sites specimens were collected by hand searching. As many micro-sites as possible were examined on each site. This mostly entailed searching the underside of large stones and fallen timber as well as the superficial soil layer beneath. Additional searches were made in leaf-litter and under the bark of fallen and standing dead wood. At a few sites leaf litter was sieved.

Specimens were collected by the authors, Steve Gregory (SJG), Paul Lee (PL), Helen Read (HJR) and Paul Richards (JPR). Species determinations were made by Steve Gregory. All specimens are stored in 75% ethanol, and currently retained in his personal collection in Oxfordshire, UK.

TABLE 1: List of localities, and outline habitats, from which samples were collected (Note: woodlice were not collected at site 6)

Site No.	Country	Province /Distrito	Locality and site details	Approx. Altitude	UTM (29T)	Latitude-Longitude	Date of collection
1	Spain	Pontevedra	Finca Rio Miño, near Goián; Domestic garden	< 50m	0519/4642	Not known	24/3/2004
2	Spain	Pontevedra	Oia, Km post 36 on road PO552; Scrubby cliff	Coastal	0509/4648	41°59'17"N, 8°53'01"W	24/3/2004
3	Spain	Pontevedra	Oia Harbour; Coastal site	Coastal	0510/4650	42°00'06"N, 8°52'37"W	24/3/2004
4	Spain	Pontevedra	Baiona; Coastal site	Coastal	0511/4663	42°07'05"N, 8°51'56"W	24/3/2004
5	Spain	Pontevedra	Gondomar; Woodland south of town	c. 100m	0520/4658	42°04'45"N, 8°44'59"W	24/3/2004
7	Spain	Pontevedra	As Eiras; Alder wood	< 50m	0519/4642	41°56'03"N, 8°46'06"W	25/3/2004
8	Spain	Pontevedra	Between As Eiras & Goián; Inshore island, R.Miño	< 50m	0519/4642	41°55'54"N, 8°46'04"W	25/3/2004
9	Spain	Pontevedra	Goián, North bank of Rio Miño; near beach	< 50m	0520/4643	Not known	25/3/2004
10	Spain	Pontevedra	As Eiras; Pine woodland	c. 50m	0517/4642	41°56'09"N, 8°47'08"W	25/3/2004
11	Spain	Pontevedra	Puerto de Moncelos; Moorland	800m	0558/4679	42°15'54"N, 8°17'48"W	26/3/2004
12	Spain	Orense	Avión, valley of Rio Valdeiras; Mixed woodland	c. 350m	0562/4691	42°22'02"N, 8°14'29"W	26/3/2004
13	Spain	Orense	Beiro; Pine woodland with oak and mimosa	c. 250m	0568/4688	42°20'52"N, 8°09'53"W	26/3/2004
14	Spain	Orense	Beade; Oakwood with chestnut & pine	c. 200m	0571/4688	42°20'27"N, 8°08'15"W	26/3/2004
15	Portugal	Viana do Castelo	Caminho, Minho; Coastal woodland & dunes	Coastal	0512/4635	41°51'02"N, 8°51'20"W	27/3/2004
16	Portugal	Viana do Castelo	Vila Praia de Âncora; Coastal dune area	Coastal	0511/4628	41°48'38"N, 8°51'35"W	27/3/2004
17	Portugal	Viana do Castelo	Castanheira; Oak woodland	c. 500m	0537/4639	41°54'09"N, 8°32'55"W	28/3/2004
18	Portugal	Viana do Castelo	Vascões; Oak woodland	c. 550m	0540/4638	41°53'29"N, 8°30'37"W	28/3/2004
19	Portugal	Viana do Castelo	Britelo; Roadside scrub & woodland	c. 150m	0557/4631	41°49'42"N, 8°18'31"W	28/3/2004
20	Portugal	Viana do Castelo	Near Central de Lindoso power station; Woodland	c. 400m	0560/4634	41°51'34"N, 8°16'26"W	28/3/2004
21	Spain	Pontevedra	Camposancos, near La Guardia;"mid-slopes"	Coastal	0511/4638	41°53'43"N, 8°51'55"W	29/3/2004
22	Spain	Pontevedra	Amorin, farmland; Ditches & woodland verges	< 50m	0525/4649	41°59'39"N, 8°41'31"W	29/3/2004

TABLE 2: List of woodlice recorded and sites from which they were collected (see Table 1 for locality details).

		Localities: Spain																Localities: Portugal					
Family	**Species**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**21**	**22**	**15**	**16**	**17**	**18**	**19**	**20**
Tylidae	*Tylos europaeus*																		#				
Ligiidae	*Ligia oceanica*			#																			
Trichoniscidae	*Trichoniscoides lusitanus*			#		#					#	#	#	#	#		#			#	#		#
Trichoniscidae	*Trichoniscoides* species A												#			#				#	#		
Trichoniscidae	*Trichoniscoides* species B															#							#
Trichoniscidae	?*Trichoniscoides* species C												#							#			
Trichoniscidae	*Trichoniscus pusillus* s.l.			#					#				#		#	#	#	#	#				#
Trichoniscidae	*Miktoniscus bisetosus*					#															#		#
Trichoniscidae	*Miktoniscus patiencei*			#	#																		
Trichoniscidae	*Haplophthalmus danicus*	#		#											#	#							
Trichoniscidae	*Haplophthalmus* sp. [*mengii*-group]				#																		
Platyartridae	*Platyarthrus hoffmannseggii*				#																		
Philosciidae	*Ctenoscia dorsalis*			#												#			#	#			
Philosciidae	*Halophiloscia couchii*			#																			
Oniscidae	*Oniscus asellus*																						#
Oniscidae	*Oniscus galicianus*							#															
Oniscidae	*Oniscus lusitanus*	#	#	#	#	#				#	#	#	#		#	#	#	#			#	#	
Porcellionidae	*Porcellionides cingendus*	#	#	#	#			#			#	#	#	#	#	#	#	#	#	#	#	#	#
Porcellionidae	*Porcellionides pruinosus*			#																			
Porcellionidae	*Porcellionides sexfasciatus*															#			#				
Porcellionidae	*Porcellio debueni*	#		#	#				#	#	#		#		#	#	#	#	#	#	#	#	#
Porcellionidae	*Porcellio dilatatus dilatatus*			#							#												
Porcellionidae	*Porcellio dispar*		#																				
Porcellionidae	*Porcellio herminiensis*											#	#	#	#					#	#		
Porcellionidae	*Porcellio scaber*	#	#	#	#			#	#	#	#					#	#	#	#			#	#
Armadillidiidae	*Armadillidium vulgare*	#	#	#	#				#		#		#			#		#	#				#
Armadillidiidae	*Eluma caelata*	#		#	#						#	#	#	#	#	#	#	#	#	#	#		#
	No. species per site:	7	5	15	10	3	0	3	4	3	8	5	10	4	8	12	7	7	9	8	8	4	10

RESULTS

In total about 1,400 specimens were collected during the field meeting, comprising 27 species of Oniscidea. The species recorded, and the sites at which they were found, are indicated in Table 2.

The species records are summarised in Table 3, which lists the number of localities from which each species was recorded and gives details of the number of specimens collected.

Full details of species records are given in the taxonomic listing presented below.

TABLE 3: Summary of species records: number of localities where found and number of individuals (male, female, juvenile, total) collected

SPECIES	No. of localities recorded	Rank by no. localities	Number of specimens collected			
			males	females	juvenile	Total
Ligia oceanica	1	= 19	0	0	1	1
Tylos europaeus	1	= 19	0	1	0	1
Trichoniscoides lusitanus	11	= 6	25	95	0	120
Trichoniscoides species A	4	= 10	14	11	10	35
Trichoniscoides species B	2	= 14	6	13	1	20
?*Trichoniscoides* species C	2	= 14	7	7	0	14
Trichoniscus pusillus sensu lato	9	8	0	54	0	54
Miktoniscus bisetosus	3	13	10	31	2	43
Miktoniscus patiencei	2	= 14	14	13	0	27
Haplophthalmus danicus	4	= 10	46	113	4	163
Haplophthalmus sp. [*mengii*-group]	1	= 19	0	3	0	3
Platyarthrus hoffmannseggii	1	= 19	0	1	0	1
Halophiloscia couchii	1	= 19	0	5	0	5
Ctenoscia dorsalis	4	= 10	10	25	0	35
Oniscus asellus	1	= 19	0	3	0	3
Oniscus galicianus	1	= 19	1	4	0	5
Oniscus lusitanus	15	= 4	35	86	14	135
Porcellionides cingendus	18	1	44	82	4	130
Porcellionides sexfasciatus	2	= 14	6	10	1	17
Porcellionides pruinosus	1	= 19	0	1	0	1
Porcellio debueni	16	2	37	81	20	138
Porcellio dilatatus	2	= 14	6	4	0	10
Porcellio dispar	1	= 19	2	5	0	7
Porcellio herminiensis	6	9	16	28	4	48
Porcellio scaber	14	3	71	74	9	154
Armadillidium vulgare	11	= 6	19	40	12	71
Eluma caelata	15	= 4	54	64	34	152
27 species			**Total number of specimens:**			**1393**

TAXONOMIC LISTING OF WOODLICE (ISOPODA: ONISCIDEA) COLLECTED

The records consist of the locality number (locality details in Table 1), the number of collected specimens (differentiated into males, females and immatures) and comments about the collection of the specimens and the known occurrence in north-west Iberia and Europe. Species nomenclature follows Schotte, M., Boyko, C.B, Bruce, N.L., Poore, G.C.B., Taiti, S., Wilson, G.D.F. (Eds) (2012).

DIPLOCHETA: Family LIGIIDAE

Ligia oceanica (Linnaeus, 1767)

Spain: Locality 3 (1j; SJG leg.)

A single juvenile specimen of this halophilous species was collected from among stones above the strandline at the Harbour at Oia. This species is widely recorded along the Atlantic coasts of Europe and the western Baltic Sea (Schmalfuss, 2003).

TYLIDA: Family TYLIDAE

Tylos europaeus Arcangeli, 1938

Portugal: Locality 16 (1♀; PL leg.)

A single female specimen of this halophilous species was collected from coastal sand-dunes at Vila Praia de Âncora. This species favours fine sand and typically occurs a few metres above mean sea level.

The family Tylidae belongs to the section Tylida, which is not represented in Britain. The uropods are positioned ventrally below the body and are not visible when the animal is viewed dorsally. This is quite distinct from other oniscids. *T. europaeus* is a widespread European species, occurring along the coasts of the Black Sea and Mediterranean, and the Atlantic coast of Europe north to Brittany, north-west France (Schmalfuss, 2003).

SYNOCHETA: Family TRICHONISCIDAE

Trichoniscoides lusitanus Vandel, 1946

Spain: Localities 3 (6♂, 10♀; SJG, JPR leg.); 5 (2♀; SJG leg.); 10 (1♀; HJR leg.); 11 (6♀; SJG, HJR, JPR leg.); 12 (6♂, 17♀; SJG, HJR leg.); 13 (1♂, 2♀; HJR leg.); 14 (1♂, 3♀; HJR, JPR leg.); 22 (3♀; SJG leg.)

Portugal: Localities 17 (10♂, 32♀; SJG, PL, HJR leg.); 18 (1♂, 12♀; SJG, HJR leg.); 20 (7♀; SJG, HJR leg.)

Collected from eleven sites, this was one of the more frequently encountered species. It was mainly recorded from inland localities, such as deciduous woodland (up to 550m asl) and upland moorland (at 800m asl), but it was also collected from a few low-lying coastal or riverine habitats beside the Rio Miño. Specimens were found beneath stones and dead wood or among leaf litter, especially in damp places, such as ditches.

This is a large (to 4.5mm) darkly pigmented species with smooth pereionites and eyes comprising a single prominent ocellus. All pigment is rapidly lost in alcohol. Although superficially similar to an *Oritoniscus* species, the characteristic shape of the male pleopods readily assigns specimens to the genus *Trichoniscoides.* Vandel (1946) recorded this species from the mountainous regions of northern Portugal and considered it to be one of the more primitive species of the genus, allied to the north-

western European *T. albidus*. Its distribution is restricted to northern Portugal and north-west Spain (Schmalfuss, 2003).

Trichoniscoides species A

Spain: Localities 12 (1♂, ?♀; SJG leg.); 21 (5♂, 3♀, 10j; SJG, HJR, JPR leg.)

Portugal: Localities 17 (2♂; PL, JPR, leg.); 18 (6♂, 8♀, 1j; SJG leg).

This is probably a new species (S. Taiti, pers. comm.). Most of the specimens were collected from deciduous woodland beneath dead wood and stones or among deep accumulation of leaf-litter. Although close to the Atlantic coast, the Camposancos specimens (locality 21) were collected at an altitude of between 100-200m asl, while the two Portuguese Oak woodlands at Castanheira and Vascões (localities 17 &18) were around 500-550m asl. Male specimens are 2-2.25mm in length, while females were 2.75-3mm. Specimens collected from Camposancos (locality 21) and Vascões (locality 18) were pinkish-red with the eye comprising a single dark red ocellus in life. All pigment was rapidly lost following preservation in alcohol. The coarse tubercles covering the body were apparent with a hand lens.

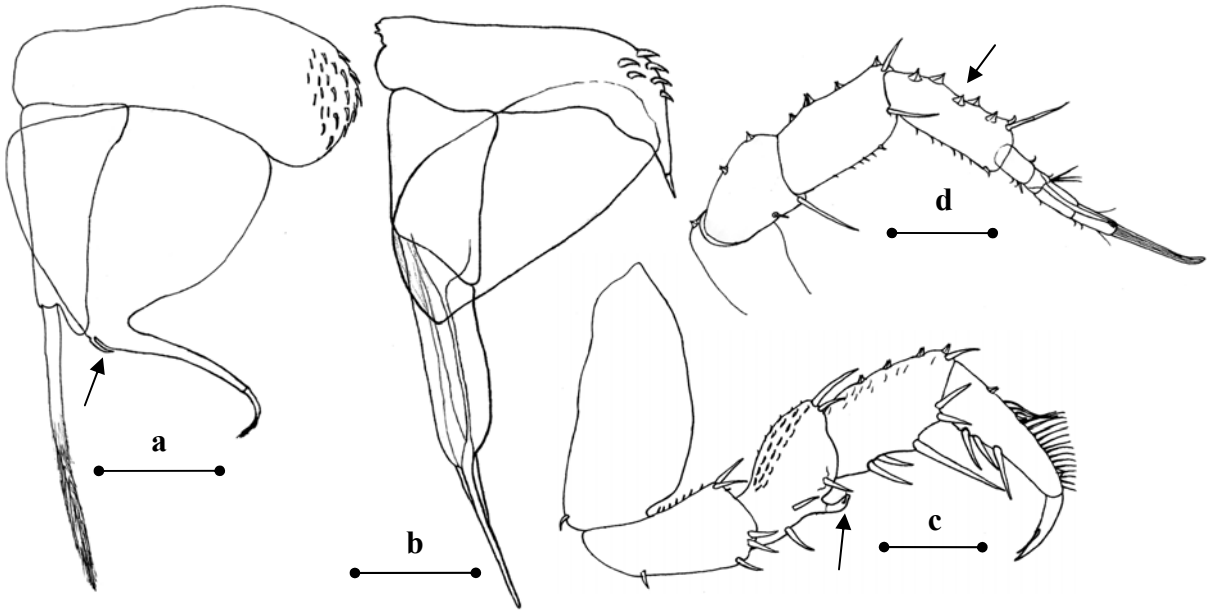

FIGURE 2: *Trichoniscoides* species A, male. Locality 17, Viana do Castelo, Portugal.
a) First pleopod; b) Second pleopod; c) Seventh pereiopod; d) Antenna
Scale bars = 0.1 mm

The male sexual characters exhibit some distinctive features. The inner distal process of the exopod of the male first pleopod is considerably reduced to little more than an elongated tubercle (arrowed, Fig. 2a), whilst the outer process is well developed and terminated in a tuft of dark bristles. The second pleopod (Fig. 2b) has the basal part of the endopod broad and parallel sided, but it rapidly narrows in the distal half to form a narrow elongated tip. In some specimens this is straight (as Fig. 2b), while in others it is curved. The merus of the male seventh pereiopod bears a distinctive hooked spur on the sternal face (arrowed, Fig 2c). The fourth and fifth articles of the antennae bear prominent tubercles, composed of groups of short scales (arrowed, Fig 2d).

The reduction of the inner spine of the first exopod and the presence of a hooked spur on the merus of the seventh pereiopod suggest an affinity to Vandel's (1960) Groupe Aquitano-languedocien, which

includes *T. cadurcensis* Vandel, 1934 a species known in south-west France (Schmalfuss, 2003). (This group also includes the 'expansive' species *T. sarsi* that occurs in Britain). *Trichoniscoides* species A differs from *T. cadurcensis* in other male characters of the seventh pereiopod and second endopod (see Vandel, 1960, pg. 266).

In Cruz's (1993) key to *Trichoniscoides* Groupe Atlantique the presence of a hooked spur on the merus of the male seventh pereiopod readily keys the specimens to *T. broteroi* Vandel, 1946, a species described from Coimbra, northern Portugal. However, there are two notable differences when Vandel's description of *T. broteroi* is compared to *Trichoniscoides* species A. Firstly, Vandel gives 4 to 4.5mm body length for *T. broteroi*, while *Trichoniscoides* species A varies between 2.75 to 3mm. Secondly, and of key significance, both distal processes on the first exopod are normally developed, albeit sub-equal, in *T. broteroi* (as seen in *Trichoniscoides* species B, Fig. 3a, below). This is very different for the reduced state of the inner process apparent in *Trichoniscoides* species A.

***Trichoniscoides* species B**

Spain: Locality 21 (2♂; JPR & HJR leg.)

Portugal: Locality 20 (4♂, 13♀, 1j; SJG leg.)

This is probably a new species (S. Taiti, pers. comm.). Specimens collected from near Central de Lindoso power station (locality 20) were from saturated peat beside a flushed area in wet deciduous woodland, in association with *Miktoniscus bisetosus* Vandel, 1946. Habitat details are not known for the two males collected from Camposancos (locality 21).

Male specimens were between 2-2.5mm in length, gravid females between 3-3.5mm. In life specimens were pale orange or pink, with an eye comprising a contrasting red ocellus. All pigment was rapidly lost in alcohol, leaving preserved specimens uniform off-white. The head bears tubercles, but these are reduced to rows of rounded bumps (each bearing a small spine) on the pereionites. There are no modifications to the male seventh pereiopod (Fig. 3c), in contrast to *Trichoniscoides* species A and C, which both bear a hooked spur on the merus.

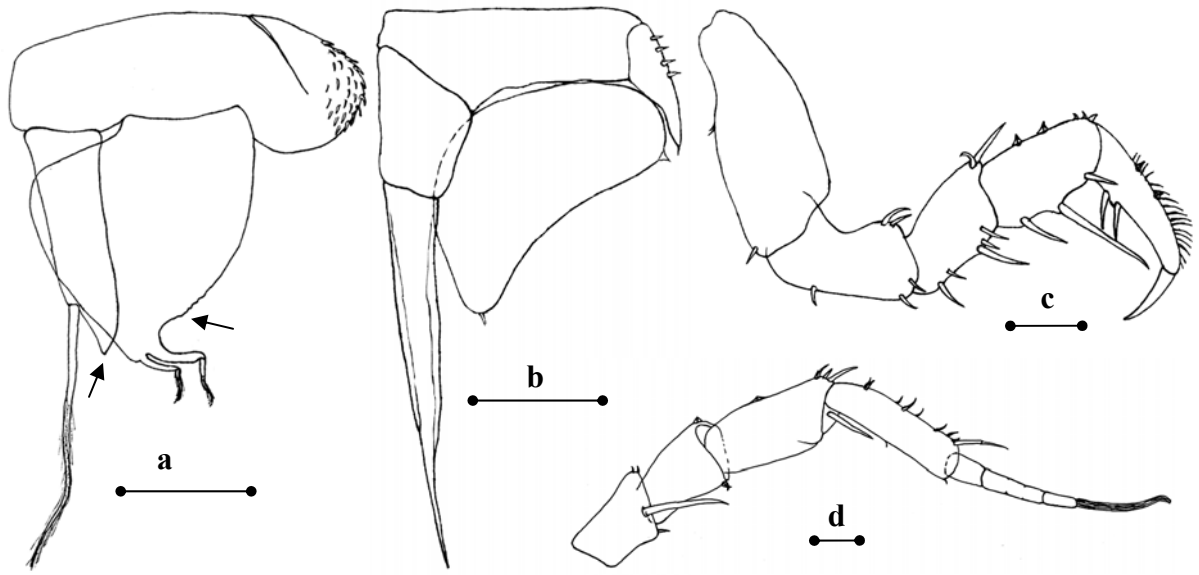

FIGURE 3: *Trichoniscoides* species B, male. Locality 20, Viana do Castelo, Portugal.
a) First pleopod; b) Second pleopod; c) Seventh pereiopod; d) Antenna
Scale bars = 0.1 mm

In Cruz's (1993) key to *Trichoniscoides* Groupe Atlantique male specimens readily key to *T. modestus* Racovitza, 1908. However, specimens do not conform to figures of this species in Vandel (1960) and are clearly not that species. The male first and second pleopods (Figs. 3a & 3b) bear similarity to those of *T. machadoi* Vandel, 1946, a species described from Portugal. However, the material examined here differs from Vandel's description in three key features. Firstly, *T. machadoi* has a well-developed 'V' notch on the outer distal edge of the 1st exopod, which is absent in the material examined here (right arrow, Fig. 3a). Secondly, *Trichoniscoides* species B has a well-developed lateral lobe to the basal segment of the first endopod (left arrow, Fig. 3a), which is absent or weakly developed in *T. machadoi*. Thirdly, the pereionites of *T. machadoi* are described as smooth ('lisses'), whereas the specimens examined here bear rounded bumps.

?*Trichoniscoides* species C

Spain: Locality 12 (5♂, 7♀; SJG & HJR leg.)

Portugal: Localities 17 (2♂, 1♀; SJG & PL leg.)

This is probably a new species, probably referable to the genus *Trichoniscoides* (S. Taiti, pers. comm.). Specimens were collected from two localities, both in woodland well away from the coast, at relatively high altitudes of 350m (locality 12, Avión) and 500m (locality 17, Castanheira). Interestingly, *Trichoniscoides* species A was also recorded from both sites.

This is a small species, with males 1.75-2.25mm in length, while females were 2.5-3.25mm. The head s covered with distinct tubercles, but these become indistinct on the body. Specimens collected at Avión (locality 12) varied from white to pale pink in life, with an eye comprising a single reddish ocellus, but all specimens faded rapidly to off-white following preservation in alcohol.

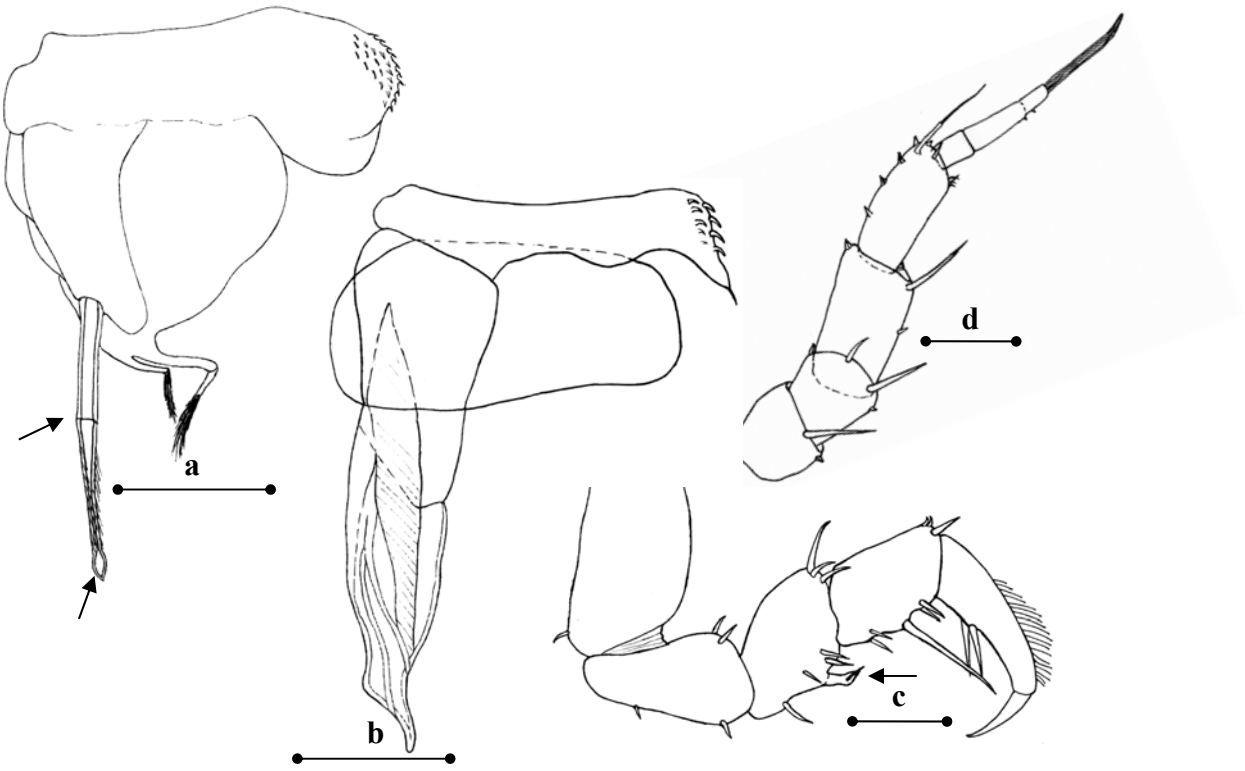

FIGURE 4: ?*Trichoniscoides* species C, male. Locality 12, Orense, Spain
a) First pleopod; b) Second pleopod; c) Seventh pereiopod; d) Antenna
Scale bars 0.1 mm

The male sexual characters are highly distinctive. Although the structure of the male first pleopod suggests a close affinity to the genus *Trichoniscoides*, the distal article of the endopod is atypical in that it is jointed at its mid-point and terminates in a swollen rounded tip (arrowed, Fig. 4a). There are two sub-equal distal processes on the first exopod, but in one specimen there is a third even smaller innermost distal process. Due to the small number of specimens examined it is not clear whether this is an anomalous specimen or not. The endopod of the male second pleopod is broad and parallel sided for much of its length, then tapers suddenly to a curved point (Fig. 4b). The male seventh pereiopod bears a prominent hooked spur, bearing a small spine, on the sternal face of the merus (arrowed, Fig. 4c). This is similar to that seen in *Trichoniscoides* species A, but there are considerable differences between the first and second pleopods of these two species.

***Trichoniscus pusillus* sensu lato**

Spain: Localities 3 (7♀; SJG, JPR leg.); 8 (7♀; SJG leg.); 12 (6♀; SJG leg.); 14 (7♀; SJG, HJR leg.); 21 (18♀; SJG, HJR, JPR leg.); 22 (1♀ HJR leg.)

Portugal: Localities 15 (6♀; HJR leg.); 16 (1♀; SJG leg.); 20 (1♀; HJR leg.)

Recorded at nine sites, this was a frequently encountered species. All specimens collected were female. Unfortunately, species within the *Trichoniscus pusillus* aggregate can only be reliably separated by microscopic examination of male specimens. In north-west Iberia, this species aggregate is likely to include three species (as recognised by Schmalfuss, 2003): *T. provisorius* Racovitza, 1908; the parthenogenetic *T. pusillus* Brandt, 1833; and possibly *T. alticola* Legrand, Strouhal & Vandel, 1950.

Considering the absence of male specimens and the large size of gravid specimens (3.75 to 4.5 mm in length), it is probable that all specimens collected refer to the genuine *T. pusillus* Brandt, 1833 which is recorded by Vandel (1946) from Portugal (under the name *T. elisabethae* Herold, 1923). Gravid females of *T. alticola* and *T. provisorius* rarely exceed 3.5 mm in length (Vandel, 1960). Since males of *T. pusillus* Brandt occur at about 1% of the population in Europe (Gruner 1966), it is very difficult to confirm the occurrence of this species by collecting a male specimen.

T. pusillus sensu lato is widely dispersed across Europe, North Africa and western Asia. The segregate *T. pusillus* Brandt, 1833 is widespread in Europe, mainly north of the Alps, and has been introduced to Madeira, the Azores and North America (Schmalfuss, 2003).

***Miktoniscus bisetosus* Vandel, 1946**

Spain: Locality 5 (1♂, 2♀; SJG leg.),

Portugal: Localities 18 (1♂, 1♀; HJR leg.); 20 (8♂, 18♀, 2j; SJG, HJR leg.)

This species was collected from three inland localities. Two of the sites are very wet: waterlogged dead wood beside a small stream in deciduous woodland (near Gondomar, locality 5) and among saturated peat beside a flushed area in wet deciduous woodland (near Central de Lindoso power station, locality 20). The third site is Oak woodland near Vascões (locality 18), but microsite details are not known. Males were c. 3mm in length, with characteristically well developed spinulation of the seventh pereiopod (Fig. 5a), with gravid females to 4.5mm.

Vandel (1946) described this species from a single site in distrito Viana do Castelo, and its known distribution is restricted to northern Portugal and north-west Spain (Schmalfuss, 2003).

***Miktoniscus patiencei* Vandel, 1946**

Spain: Localities 3 (3♂, 4♀; SJG leg.); 4 (11♂, 9♀; SJG leg.).

This would appear to be the first formal record of this species in Spain; Schmalfuss (2003) gives the known distribution of this species from northern France to Ireland and Scotland. However, David Bilton (1993, BISG Newsletter 35) informally reports this species from coastal sites in Galicia.

In contrast to *M. bisetosus*, this species was found exclusively on the coast. It was collected from among strandline debris at two sites at Oia Harbour and Baiona. In addition to habitat preferences, this species differs from *M. bisetosus* in male sexual characters, particularly in the less well-developed spinulation of the male seventh pereiopod (Fig. 5b) and its smaller size (female to 3.5 mm).

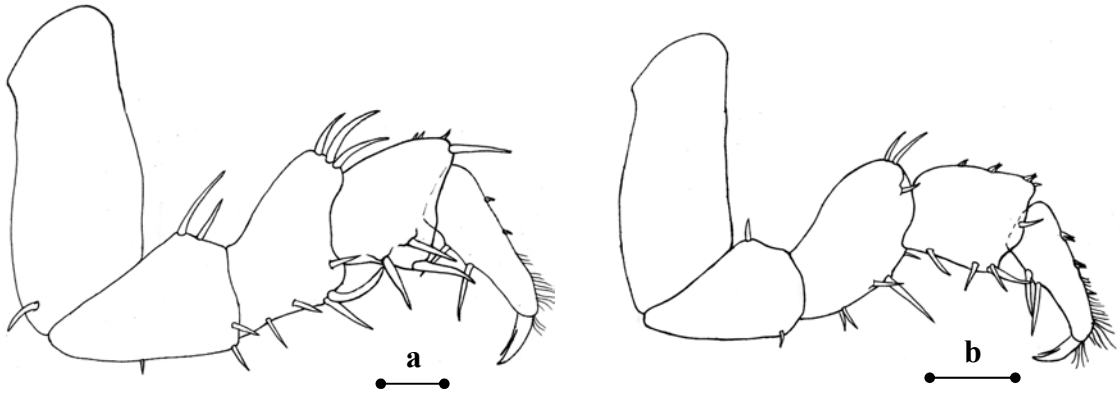

FIGURE 5: *Miktoniscus* species, male seventh pereiopod
a) *Miktoniscus bisetosus*. Locality 20, Viana do Castelo, Portugal
b) *Miktoniscus patiencei*. Locality 4, Pontevedra, Spain
Scale bar = 0.1 mm

***Haplophthalmus danicus* Budde-Lund, 1880**

Spain: Localities 1 (6♀; SJG, JPR leg.); 3 (1♂; SJG leg.); 14 (8♂, 24♀, 3j; SJG leg.); 21 (c.30♂, c.70♀; SJG, JPR leg.)

Specimens were collected from four sites varying from synanthropic (domestic garden at Finca Rio Miño)' to coastal (Oia Harbour), to semi-natural woodland (Oak woodland near Beade). At Camposancos, near La Guardia (locality 21), it was abundant in rotting timber lying on the ground near a carpark. This is a widespread species across Europe, where it has been widely spread by human activity, and it has been widely introduced to other parts of the world (Schmalfuss, 2003).

***Haplophthalmus* species (*mengii*-group)**

Spain: Locality 4 (3♀; SJG leg.)

Three female specimens were collected from beneath dead wood just above the storm high-water mark on the coast near Baiona. The well developed haplophthalmoid sculpturing of the pereionites and a pair of prominent projections on the third pleonite suggest that the specimens belong to the *H. mengii* species aggregate. Unfortunately, in the absence of a male, it is not possible to determine the actual species since other species allied to *H. mengii* (Zaddach, 1844), such as *H. asturicus* Vandel, 1952, are known to occur in north-west Spain.

CRINOCHETA: Family PLATYARTHRIDAE

***Platyarthrus hoffmannseggii* Brandt, 1833**

Spain: Locality 4 (1♀; JPR leg.)

A single specimen was collected from an ants' nest from coastal habitat near Baiona. Due to its specialist niche, within ant's nests, it is possible that this common European species was over-looked at other sites surveyed. This widespread myrmecophilous species is known from much of Europe, North Africa and Asia Minor (Schmalfuss, 2003).

CRINOCHETA: Family HALOPHILOSCIIDAE

***Halophiloscia couchii* (Kinahan, 1858)**

Spain: Locality 3 (5♀; SJG leg.)

Female specimens of this halophilous species were collected from among stones above the strandline at the Harbour at Oia. Although several species of *Halophiloscia* have been described from the coastline of western Europe, Schmalfuss (2003) considers all to be junior synonyms of *H. couchii* (Kinahan, 1858). As defined by Schmalfuss (2003) this species has a very wide geographic distribution, along the Atlantic coasts from Dakar (Senegal) to the British Isles, and along the coasts of the Mediterranean Sea and the Black Sea.

CRINOCHETA: Family PHILOSCIIDAE

***Ctenoscia dorsalis* (Verhoeff, 1928)**

Spain: Localities 3 (5♂, 10♀; SJG, JPR leg.); 21 (2♂, 13♀; SJG leg.)

Portugal: Localities 16 (2♂, 2♀; SJG leg.); 17 (1♂; SJG leg.)

Specimens were collected from four sites. Three of these were coastal localities: among leaf-litter beneath scrub just above the sea-shore at Oia Harbour; among leaf-litter at Camposancos near La Guardia; and from coastal dunes at Vila Praia de Âncora. The fourth site, well away from the coast, was Oak woodland near Castanheira (locality 17). *C. dorsalis* is recorded mainly from coastal areas from Malta in the eastern Mediterranean to western Spain (Schmalfuss, 2003). Vandel (1946) reports its congener *Ct. minima* (Dollfuss, 1892), which differ in detail of the male first pleopod, from Portugal.

CRINOCHETA: Family ONISCIDAE

***Oniscus asellus* Linnaeus, 1758**

Portugal: Locality 20 (3♀; SJG, JPR leg.)

It is perhaps surprising that this common western European species was only recorded at a single site. However, in this part of the Iberian peninsular it is more-or-less replaced by its congener *O. lusitanus* (see below). Specimens were collected from under bark on a rotting log in road-side woodland near Central de Lindoso power station. With a broad Atlantic distribution, *O. asellus* is one of the most abundant (and familiar) species of western Europe (Schmalfuss, 2003).

***Oniscus galicianus* Bilton, 1997**

Spain: Locality 7 (1♂, 4♀; SJG leg.)

Specimens (confirmed by D.T.Bilton) were collected from among wet leaf litter in Alder woodland close to the Rio Miño near As Eiras. This is typical of the wet habitats reported for *O. galicianus* by Bilton (1997) who describes this species from material collected from ten localities in central Galicia, mainly in the province of Lugo. It is superficially similar to *O. asellus*, but differs in the form of the exopod and the tip of the endopod of the male first pleopod. This record considerably extends the range of this Galician endemic further south and west. Within its known range *O. galicianus* seems to favour colder regions than *O. lusitanus* and wetter microsites than *O. asellus* (Bilton, 1997).

***Oniscus lusitanus* Verhoeff, 1908**

Spain: Localities 1 (5♀; SJG leg.); 2 (2♀; SJG leg.); 3 (4♂, 8♀, 2j; SJG, JPR leg.); 4 (1♂, 4♀, 1j; SJG leg.); 5 (1♂; SJG leg.); 9 (2♂, 1♀; SJG leg.); 10 (5♂, 11♀; SJG leg.), 11 (3♂, 4♀, 1j; SJG, HJR, JPR leg.); 12 (1♂, 1♀; SJG leg.); 14 (1♀; SJG leg.); 21 (13♂, 15♀, 4j; SJG, HJR, JPR leg.); 22 (3♀, 1j; SJG, JPR leg.)

Portugal: Localities 15 (4♂, 29♀, 2j; SJG, JPR leg.); 1 8(1♂, 3j; SJG, HJR leg.); 19 (1♀; SJG leg.)

Recorded from 15 sites, this was one of the most frequently encountered oniscid species. It was found in all principal habitats surveyed, from synanthropic sites, coastal sites, semi-natural Pine or Oak woodland to upland moorland, and typically numerous when found. Although known from central Portugal northwards to Asturias in north-west Spain (Schmalfuss, 2003), this species is most abundant in the warmer climes of northern Portugal and southern Galicia (Bilton, 1997).

CRINOCHETA: Family PORCELLIONIDAE

***Porcellionides cingendus* (Kinahan, 1857)**

Spain: Localities 1 (6♂, 6♀; SJG leg.); 2 (1♂, 4♀; SJG, JPR leg.); 3 (3♂, 6♀; SJG, JPR leg.); 4 (8♂, 7♀; SJG, JPR leg.); 7 (1♂; SJG leg.); 10 (1♀; HJR leg.); 11 (5♂, 5♀; SJG, HJR leg.); 12 (3♂, 4♀; SJG leg.); 13 (1♂ 4♀; SJG, HJR leg.); 14 (2♂, 6♀; SJG, HJR leg.); 21 (1♂, 1♀; HJR, JPR leg.); 22 (2♂, 3♀; SJG, HJR leg.)

Portugal: Localities 15 (2♂, 10♀; SJG, HJR, JPR leg.); 16 (6♂, 18♀, 2j; SJG, HJR, JPR leg.); 17 (3♀; SJG, HJR leg.); 18 (2♂; SJG, HJR leg.); 19 (1♂, 2♀, 2j; SJG, HJR leg.); 20 (2♂, 3♀; SJG, HJR, JPR leg.)

This was the most frequently recorded species, collected from 18 sites, and typically numerous when found. It was found in all principal habitats surveyed, from synanthropic sites, coastal sites, semi-natural Pine or Oak woodland to upland moorland. This species has a strict Atlantic distribution, and is known from the Atlantic coastal areas of Portugal, Spain, France, southern Britain and Ireland (Schmalfuss, 2003).

***Porcellionides sexfasciatus* (Budde-Lund, 1885) ssp. *lusitanus* (Vandel, 1946)**

Spain: Locality 21 (3♂, 6♀; SJG leg.)

Portugal: Locality 16 (3♂, 4♀, 1j; SJG, JPR leg.)

Specimens of this distinctively coloured species were collected from two coastal locations; grassland at Camposancos, near La Guardia, and sand dunes at Vila Praia de Âncora. Male specimens were referable to sub-species *lusitanus* (Vandel, 1946), which was originally described from Portugal. This is a widely recorded species across the western Mediterranean region, and has been introduced to many other parts of the world (Schmalfuss, 2003).

***Porcellionides pruinosus* (Brandt, 1833)**

Spain: Locality 3 (1♀; JPR leg.)

A single specimen of this cosmopolitan synanthrope, that was associated with *Porcellio dilatatus*, was collected from a coastal location at Oia Harbour. Additional habitat information is not known. Although originating in the Mediterranean area, *P. pruinosus* has been widely introduced elsewhere (Schmalfuss 2003).

***Porcellio debueni* Dollfus, 1892**

Spain: Localities 1 (1♂, 7♀; SJG leg.); 3 (1♂, 2♀; SJG, JPR leg.); 4 (1♀; SJG leg.); 8 (1♀; SJG leg.); 9 (1♀; SJG leg.); 10 (2♂, 9♀, 4j; SJG, HJR leg.); 12 (1♂, 4♀, 1j; SJG, JPR leg.); 14 (1♀; SJG leg.); 21 (7♂, 11♀, 2j; SJG, HJR, JPR leg.); 22 (12♂, 14♀, 2j; SJG, HJR, JPR leg.)

Portugal: Localities 15 (2♂, 10♀, 3j SJG, HJR, JPR leg.); 16 (1♂, 3♀; SJG, HJR leg.); 17 (2♂, 1♀, 1j; SJG, HJR, JPR leg.); 18 (5♂, 6♀, 2j; SJG, HJR leg.); 19 (1♂, 6♀, 1j; SJG, HJR leg.); 20 (2♂, 4♀, 4j; SJG, HJR leg.)

This was the second most commonly recorded species, collected from 16 sites. *P. debueni* is a large species with a distinctive smooth dorsal surface and mottled colouration. It was found in a wide range of habitats from synanthropic sites (including a domestic garden at Finca Rio Miño), to coastal sites (e.g. Oia Harbour), to semi-natural Pine or Oak woodland. This is a species endemic to Portugal and north-west Spain (Schmalfuss 2003).

***Porcellio dilatatus* Brandt, 1833**

Spain: Localities 3 (1♂sub-adult; JPR leg.); 10 (5♂, 4♀; SJG leg.)

This species was recorded from two localities, a single sub-adult from a coastal site at Oia (associated with *Porcellionides pruinosus*) and several specimens from among dumped garden rubbish in Pine woodland near As Eiras. This is a widespread European species, which has been widely introduced to many other parts of the world (Schmalfuss, 2003).

***Porcellio dispar* Verhoeff, 1901**

Spain: Locality 2 (2♂, 5♀; SJG leg.).

This would appear to be the first record for Spain. Several specimens were collected from among rotting timber and rubbish below a small seepage issuing from a clay sea cliff. The site was not only coastal, but exhibited strong synanthropic influences. According to Schmalfuss (2003), previously this species has only been recorded from Portugal, but its occurrence in north-west Spain is not unexpected.

***Porcellio herminiensis* Vandel, 1946**

Spain: Localities 11 (1♂, 1♀; SJG leg.); 12 (8♂, 4♀, 1j; SJG, HJR leg.); 13 (2♂, 2♀; SJG, HJR leg.); 14 (1♂, 4♀; HJR, JPR leg.)

Portugal: Localities 17 (3♂, 15♀, 3j; SJG, HJR, JPR leg.); 18 (1♂, 2♀; SJG leg.)

This distinctive species was recorded from six upland localities, between 200m and 800m asl., in the Spanish province of Orense and the Portuguese distrito of Viana do Castelo (Fig. 6). Most of the records are from Oak woodland, but it was also collected from Pine woodland and moorland. Specimens were collected from beneath stones and dead wood. Vandel (1946) described this species from northern Portugal at altitudes of 950 to 1000m, but also reports its occurrence at low altitude. It is endemic to northern Portugal and north-west Spain (Schmalfuss, 2003).

***Porcellio scaber* Latreille, 1804**

Spain: Localities 1 (14♂, 5♀; SJG leg.); 2 (2♂, 2♀, 1j; SJG leg.); 3 (8♂, 11♀; SJG, JPR leg.); 4 (1♂; SJG leg.); 7 (2♂, 8♀, 6j; SJG, HJR leg.); 8 (9♂, 9♀; SJG, HJR leg.); 9 (1♂, 2j; SJG, HJR leg.); 10 (2♂, 7♀; SJG leg.); 21 (5♂, 7♀; SJG, HJR, JPR leg.); 22 (2♂, 2♀; SJG leg.)

Portugal: Localities 15 (9♂, 11♀; SJG leg.); 16 (12♂, 11♀; SJG, JPR leg.); 19 (1♂, SJG leg.); 20 (3♂, 1♀; SJG leg.)

Although a widely recorded species collected at 14 localities, *P. scaber* was most numerous in synanthropic sites and/or low-lying coastal areas (at altitudes from sea-level to 150m). In semi-natural forest it was encountered in small numbers. Although collected at up to 350m asl. (i.e. at locality 20, near Lindoso Power Station), it was generally absent in upland areas (where its congener *P. herminiensis* was found instead; Fig. 6).

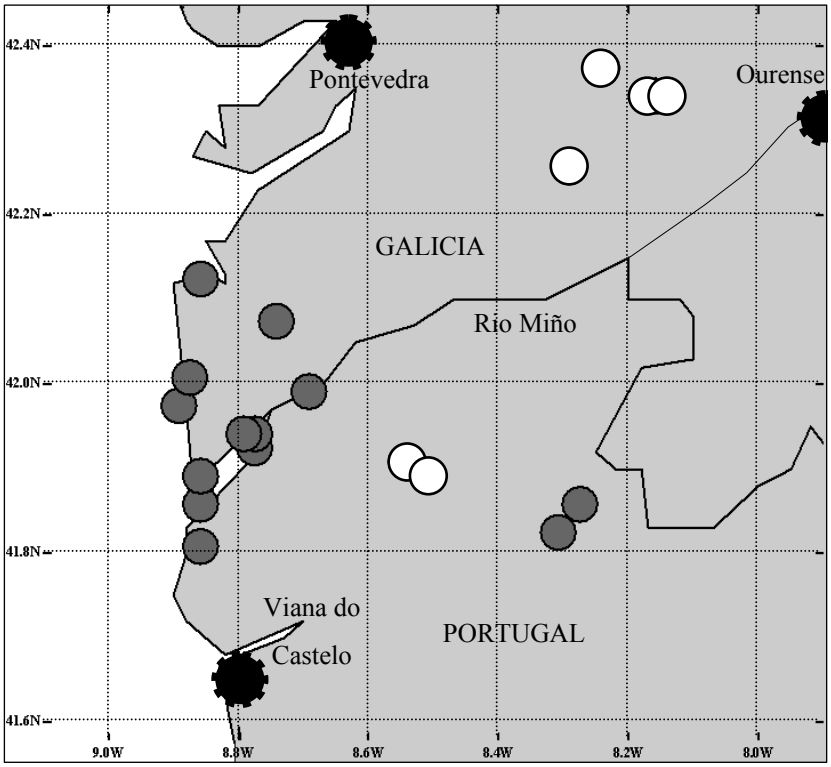

FIGURE 6: Distribution of *Porcellio* records: *Porcellio scaber* (dark grey circles), mostly 0-150m asl, and *Porcellio herminiensis* (white circles), between 200 and 800m asl.

P. scaber ssp. *scaber, P. scaber* ssp. *lusitanus* and intermediate forms were present in the samples and have not been differentiated. *P. s.* ssp. *lusitanus* was initially described as a distinct species *P. lusitanus* Verhoeff 1907, primarily distinguished from *P. scaber* by its larger size (to 18mm length), better developed tubercles on the head and body and strongly developed lateral lobes on head. However, the presence of intermediate forms suggested that these characters were allometric. They are now considered to be geographical sub-species (Vandel, 1966; Schmalfuss, 2003), with *P. scaber* ssp. *lusitanus* predominantly occurring in Portugal and north-west Spain.

With a broad Atlantic distribution, *P. scaber* is one of the most abundant species in western Europe (Schmalfuss, 2003).

CRINOCHETA: Family ARMADILLIDIIDAE

***Armadillidium vulgare* (Latreille, 1804)**

Spain: Localities 1 (6♂, 9♀; SJG leg.); 2 (2♂, 6♀; SJG, JPR leg.); 3 (1♀; JPR leg.); 4 (1♂, 7♀, 2j; SJG, JPR leg.); 8 (1♀; SJG leg.); 10 (2♂, 8♀, 9j; SJG leg.); 12 (5♂, 4♀, 1j; SJG leg.); 21 (1♂, 1♀; SJG leg.)

Portugal: Localities 15 (1♀; SJG leg.); 16 (1♂, 2♀; JPR leg.); 20 (1♂; JPR leg.)

Collected from 11 sites, typically coastal, low-lying or synanthropic. It may be significant that the two inland sites, near Avión (locality 12) and near Central de Lindoso power station (locality 20) were both from road-side verges. Although native to the Mediterranean region, it has been introduced to all parts of the world (Schmalfuss, 2003).

***Eluma caelata* (Miers, 1877)**

Spain: Localities 1 (15♂, 13♀; SJG, JPR leg.); 3 (2♂, 6♀; SJG, JPR leg.); 4 (8♂, 5♀, 3j; SJG, JPR leg.); 10 (4♂, 5♀, 4j; SJG, HJR leg.); 11 (2♀; SJG leg.); 12 (3♀, 6j; SJG, HJR leg.); 13 (1♂, 1j SJG, HJR leg.); 14 (3j HJR, JPR leg.); 21 (11♂, 10♀, 6j SJG, PL, HJR, JPR leg.); 22 (1♀, 2j SJG, HJR leg.)

Portugal: Localities 15 (6♂, 8♀, 4j SJG, HJR, JPR leg.); 16 (2♀; SJG, HJR leg.); 17 (2♂, 4♀, 1j SJG, PL, HJR, JPR leg.); 18 (4♂, 4♀, 1j SJG, PL, HJR leg.); 20 (1♂, 1♀, 3j SJG, HJR, JPR leg.)

Collected from 15 localities, this was one of the most frequently recorded species. It was found in most habitats sampled from coastal scrub, synanthropic sites, deciduous woodland to upland moorland at 800m asl. This species has a strict Atlantic distribution, occurring along the Atlantic coastal fringe, and off-shore islands, from north-west Africa, to western Iberia and western France, north to the British Isles (Schmalfuss, 2003).

DISCUSSION

In total, 27 species of oniscidea were collected during this survey. The five most frequently recorded species were *Porcellionides cingendus* (recorded from 18 localities), *Porcellio debueni* (16 localities), *Oniscus lusitanus, Eluma caelata* (both from 15 localities) and *Porcellio scaber* (14 localities) (Table 3). These five species account for 51% of the woodlouse records made during the field trip (Table 2), and were recorded from a wide variety of the habitats surveyed. Other frequently recorded species included *Trichoniscoides lusitanus* and *Porcellio herminiensis*, which are both endemic to north western parts of the Iberian peninsular, and *Armadillidium vulgare* and *Trichoniscus pusillus* sensu lato, which are both widespread throughout Europe (Schmalfuss, 2003).

It is apparent that the fauna is dominated by species that are either endemic to north-western Iberia, or exhibit strict Atlantic distributions along the oceanic fringe of western Europe. Seven species, *T. lusitanus, Miktoniscus bisetosus, O. lusitanus, Oniscus galicianus, Porcellio debueni, P. dispar* and *P. herminiensis*, are endemic to the region (Schmalfuss, 2003). It is probable that three additional species, *Trichoniscoides* sp. A, *Trichoniscoides* sp. B and *?Trichoniscoides* sp. C, will also prove to be endemic to this area. This total of 10 endemic species represents 36% of the oniscid species collected. An additional four species have Atlantic distributions centred on western Europe, of which *P. cingendus* and *E. caelata*, are more or less restricted to the relatively moist coastal fringe of western Europe, whereas *Oniscus asellus* and *P. scaber* penetrate further east into central Europe.

Other woodlice species recorded are also widespread throughout Europe. Some, such as *Haplophthalmus danicus, Haplophthalmus* species (*mengii*-group), *Trichoniscus pusillus* sensu lato and *Platyarthrus hoffmannseggii* exhibit a Continental distribution based on central Europe. The remainder, including *Ctenoscia dorsalis*, *Porcellionides pruinosus*, *Porcellionides sexfasciatus*, *Porcellio dilatatus* and *A. vulgare*, exhibit a Mediterranean distribution based on southern Europe.

Four species are exclusively coastal. *Ligia oceanica* and *Miktoniscus patiencei* are confined to the Atlantic coasts of Europe. The records presented herein indicate that the distribution of the latter species extends as far south as the Portuguese border. *Tylos europaeus* and *Halophiloscia couchii* are both widespread along the Atlantic and Mediterranean coasts of Europe.

Overall, coastal sites proved to be the most species diverse, with between five and fifteen oniscid species recorded (mean per site 9.2 species). This included the four halophilous species mentioned above, but also species such as *P. hoffmannseggii*, *Ct. dorsalis*, *P. sexfasciatus* and *P. dispar*. In stark contrast, other lowland habitats, such a garden, river-side scrub and woodland, which were not situated adjacent to the coast, proved to be the least species rich. Between three to eight species were recorded per site (mean 5.0 species). However, this did include the endemic *O. galicianus*, which was not recorded elsewhere. Semi-natural woodlands, which lay between 100 to 550m altitude, also held a good species diversity with between four and eleven species recorded per site (mean 7.4 species). This included the endemic species *M. bisetosus* and *P. herminiensis*.

Three species of Trichoniscid woodlice (sp. A, B & C) remain undetermined and may be new. Outline descriptions of these three species have been given herein, which should allow future specimens to be recognised pending clarification of their true identity or formal description. The oniscid fauna of the Iberian Peninsular is relatively poorly known compared to other parts of southern Europe. Glacial refuges, such as Italy and Greece, are known to support a large and diverse oniscid fauna (Schmalfuss, 2003). It is highly probable that the Iberian Peninsular, another glacial refuge, holds an equally diverse fauna and that further species, such as these, await discovery.

ACKNOWLEDGEMENTS

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CENTIPEDES FROM THE FYLDE COAST (LANCASHIRE) AND ADJACENT AREAS

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INTRODUCTION

Lancashire has been the focus of myriapod studies at several periods in the past with contributions from H.K.Brade & S.G.Birks (H.K. & S.G. Brade-Birks), A.Randell Jackson and R.S.Bagnall in the earlier part of the twentieth century. In 1916 H.K.Brade & S.G. Birks, in their *Notes on Myriapoda-IV*, published a preliminary list for South Lancashire (vice-county 59) (Brade & Birks, 1916). Their list (nomenclature updated) included *Cryptops hortensis*, *Geophilus carpophagus* sl., *Geophilus flavus, Geophilus insculptus*, *Geophilus truncorum*, *Lamyctes emarginatus*, *Lithobius calcaratus*, *Lithobius crassipes*, *Lithobius forficatus*, *Lithobius melanops*, *Lithobius microps*, *Lithobius variegatus*, *Stenotaenia linearis* and *Stigmatogaster subterranea*.

Many of these records were from the Darwen area but there were others from Manchester and elsewhere. In subsequent papers (Brade & Brade-Birks, 1917, Brade-Birks & Brade-Birks, 1918, Brade-Birks & Brade-Birks, 1919) they added *Schendyla nemorensis*, *Lithobius borealis* and *Strigamia maritima* to the Lancashire list. *Geophilus algarum* as listed in their list (after R.S.Bagnall) has been shown not to refer to that species but to what were possibly immature *Strigamia maritima* (Eason, 1961). In due course H.K. & S.G. Brade-Birks moved from Lancashire to Kent and although continuing with their *Notes on Myriapoda* right up until 1939 these no longer specifically related to Lancashire and Cheshire.

After the Second World War, J.Gordon Blower and his students at Manchester University engaged extensively in myriapod studies although not especially in Lancashire, it seems. In April 1986 a British Myriapod Group / British Isopod Study Group joint meeting organised by Gordon at Manchester (BMG,1986) made a number of records in that area.

Liverpool Museum (National Museums & Galleries on Merseyside) has centipede records for both South Lancashire and elsewhere from the 1970's and 1980's as well as a series of more recent records and thanks to Ian Wallace & Chris Felton we have had access to these and to records of the house centipede *Scutigera coleoptrata* from a flat at The Dingle (1994) and from south Liverpool (1996). This is a species only found inside buildings in mainland Britain. In 1993 a specimen of *Cryptops anomalans* was found in a basement room at the Museum.

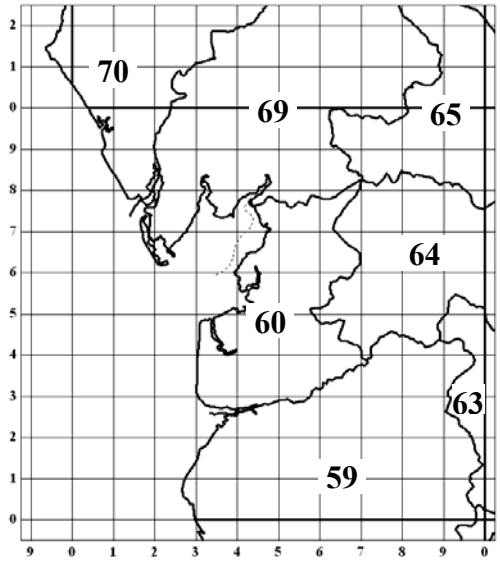
Bolton Museum has a number of centipede records dating from the period 1988-2003 which we have been able to access via Greater Manchester Local Record Centre (Steve Atkins). These include no additional species for Lancashire and their records of *Scutigera coleoptrata* from Tyldesley Garden cannot be currently accepted in the absence of either specimens or appropriate validation.

In October 2005, one of us (AB) collected in the Southport area without adding further species to the vice-county list. All these records have been included in the Centipede Recording Scheme data.

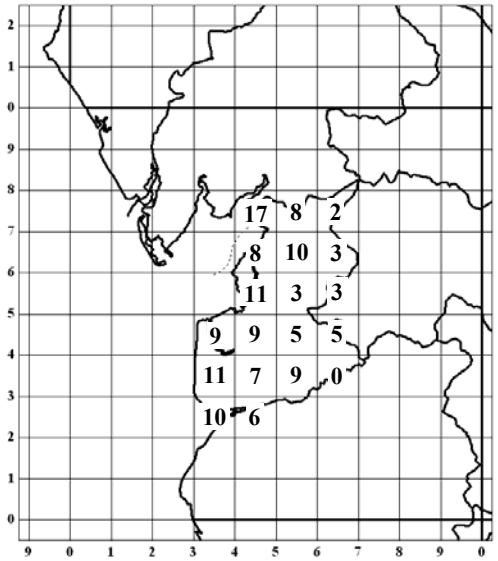
As far as vice-county 60 (West Lancashire) is concerned, recording has been much more patchy. There are old records for 1915 from Challan Hall, near Silverdale (*Geophilus insculptus*, *Cryptops hortensis, Schendyla nemorensis*), near Silverdale (*Geophilus truncorum, Lithobius variegatus*) and

Silverdale (*Geophilus flavus*) and there is a Brade-Birks 1916 record from Silverdale (*Geophilus electricus*). There is also a record by R.S.Bagnall from Arnside 1919 (*Strigamia maritima*), just over the border in vice-county 69 (Westmorland with North Lancashire).

Later unascribed records include species from Silverdale 1950 (*Lithobius calcaratus, Lithobius forficatus*, *Lithobius melanops*, *Strigamia acuminata*), Lytham 1958 (*G.insculptus, L.forficatus*), Thistleton 1958 (*G.truncorum, Lithobius crassipes*, *L.forficatus*,) and Garstang Wood 1950 (*G.flavus*). Other records are by AB from Lancaster (1973: *S.subterranea*), C.Felton from Silverdale (1973: *L.calcaratus*), D.T.Richardson from Warton Crag (1976: *G.insculptus, L.calcaratus, L.forficatus)* and Tatham (*G.insculptus*), M.Fogan from Warton (1978: *L.microps*) and N.Jackson from SD56 (1981: *Geophilus carpophagus* sl).



MAP 1: West Lancashire (VC 60) & surrounding area showing vice counties



MAP 2: Number of species recorded for each 10km square in VC 60

The BMG / BISG meeting at Lancaster in April 1983 (unpublished) recorded *Geophilus insculptus, G. truncorum, L.forficatus*, *Lithobius macilentus*, *L. microps* and *L.variegatus* from Arnside Knott (in VC69), *G.insculptus, G.truncorum, L.forficatus* and *L.macilentus* from Gait Barrows, together with *C.hortensis*, *G.insculptus*, *L.crassipes*, *L.forficatus, L.melanops*, *L.microps*, *Schendyla nemorensis* and *Stigmatogaster subterranea* from St.Martin's College, Lancaster also various other records from adjacent VC69. A record of *Geophilus carpophagus* sl from Eaves Wood (01.04.83) is ascribed to A.N.Keay. In July 1984 AB collected specimens in the Myerscough area (*G.insculptus*, *L.crassipes*, *L.forficatus, L.melanops, L.variegatus*). He had previously recorded *L.forficatus* and *Lamyctes emarginatus* from Lancashire College of Agriculture, Myerscough and the latter also from Dinkling Green.

There are records by S.J.Gregory from Jenny Brown's Point, Silverdale (*G.truncorum*, *G.insculptus*, *G.flavus, L.melanops*, *L.microps*, *S.subterranea, S.maritima*) and from Over Kellet church (*G.insculptus, G.flavus, L.melanops*, *L.microps*, *S.nemorensis, S.subterranea*), both sets of records from 19.04.95 and a record by S.P.Garland of *L.variegatus* and *L.crassipes* from Fulwood (06.07.95). Also cave records from Warton Quarry mine (1995: *G.insculptus*) and Hazel Grove Cave (M.Morely,1999: *G.insculptus* & *Geophilus electricus*).

Since 1997 JS has been collecting specimens from the Fylde coast and other areas of VC60 by both hand-sorting and pitfall trapping and these have been examined by AB. These, supplemented by further records by Jennifer Newton (indicated JN) and with some records from ants nests by Dr. Elva

Robinson (indicated ER) from Arnside Knott, Grubbins Wood and Gait Barrows (determined by Paul Lee) are listed herewith. Several of JN's records are from vice-counties 64 (Mid-west Yorkshire) or VC69 but are included here for completeness.

Map 1 shows vice-county 60 and adjacent areas of other vice-counties; Map 2 indicates the total number of species recorded from each of the 10km grid squares of VC60. Maps are also presented for each species showing occurrences since 1960, including all the above post-1960 records (Maps 3 – 25). It should be noted that a number of the records, including both records for *Lithobius curtipes*, do not relate to VC60.

GEOPHILOMORPHA

Family HIMANTARIIDAE

Stigmatogaster subterranea (Shaw)

A large, yellow species which, although found as far north as the west coast of Scotland, is typically synanthropic in the northern parts of its range. We have records from SD32: garden at St.Annes (19.10.97 and regularly thereafter) & Lytham Hall woodland (08.07.12), SD33: wood by Queensway, St.Annes (09.06.06, 28.06.12), SD43: Bucks Moss Wood, Salwick (26.06.12), SD45: Back Wood, Thurnham (18.07.12), (all JS) SD46: Heysham Moss SSSI (06.10.04, JN), SD47: Arnside Knott (VC69) (06.04.09, ER) and SD 57: Dalton Crags (20.06.12, JS). (Map 3)

Family SCHENDYLIDAE

Schendyla nemorensis (C.L.Koch)

A small, pale species recorded from a diversity of habitats both rural and urban. Recorded on five occasions - SD32: garden at St.Annes (05.03.99), SD34: under bark of dead tree at the Mount, Fleetwood (05.03.99), SD45: upper shore at Bank Houses, Cockerham (11.10.09) (all JS), SD47: Gait Barrows (11.04.03) and Arnside Knott (VC69) (06.04.09) (both ER). (Map 4)

Family LINTOTAENIIDAE

Strigamia acuminata (Leach)

A male of this species was collected by JS at Gibson Wood, Quernmore (SD56, 29.06.12) and a further one in Back Wood, Thurnham (SD45, 18.07.12). It had previously been recorded in VC60 at Eaves Wood, Silverdale (SD47) during the BMG/BISG meeting in 1983. (Map 5)

Strigamia maritima (Leach)

This is an exclusively seashore species found all round the British Isles in suitable habitats. It is here recorded from SD32: Granny's Bay, Fairhaven (20.06.04, 14.04.06, 10.03.09), SD34: south of Wardley's Creek, Hambleton (18.10.98) & Arm Hill, south of Knott End (11.04.04), SD45: north of Cockersands Abbey (18.07.12) (all JS). (Map 6)

Family GEOPHILIDAE

Geophilus carpophagus sensu lato

Until the latter years of the 20th century *Geophilus carpophagus* Leach as described by most authors was regarded as a single species although in due course it was recognised that there were two forms, a

"short form" found in moorland, woods, etc. and a "long form" found in synanthropic sites, climbing trees, in buildings and at the coast. These are now regarded as separate species, *G.easoni* and *G.carpophagus* sensu stricto. Hence the name "*G.carpophagus* sensu lato" as used here must be regarded as encompassing both species. With a few exceptions, therefore, older data cannot be assigned specifically to *easoni* or *carpophagus* ss. The map for *G.carpophagus* sl shows such records plus those for the two separate species. (Map 7)

***Geophilus carpophagus* Leach sensu stricto**

This is the larger species of the two which were formerly all regarded as *G.carpophagus* and typically associated with buildings and trees at the coast. There is a single record - SD45: upstairs, inside a house, Thurnham Bridge Cottages, Thurnham (13.04.09, JN). (Map 8)

Geophilus easoni* Arthur *et al

The smaller of the two species formerly regarded as one (as *G.carpophagus*) and typically an animal of woodland, heathland and moor, etc. Two records - SD 44: relict mossland at Out Rawcliffe 13.09.08 (JS) and SD79 (VC65, north-west Yorkshire): in a garden, Sprintgill, 12 miles NE of Sedbergh 27.03.96 (JN). (Map 9)

***Geophilus electricus* Linné**

Many records of this species seem to be from synanthropic sites but it does not seem to be confined to them although patchily distributed. Collected in pitfall traps on three occasions (24.04.11, 08.09.11, 07.10.11) at New Laund Hill, Whitewell in SD64 (JS). (Map 10)

***Geophilus flavus* (De Geer)**

A species that is widely distributed over most of Great Britain and Ireland except, apparently N.Scotland. Records from nine sites – SD33: Peel clay-pits, SD34: cliffs at Norbreck & upper shore near Liscoe, SD42: Warton Bank (twice) & above Lea Marsh, SD44: in mole hill debris, field at Out Rawcliffe & riverbank, St.Michaels-on-Wyre, SD45: sea embankment north of Cockersands Abbey, (all JS), SD47: Gait Barrows (ER). (Map 11)

***Geophilus insculptus* Attems**

This is a species widely distributed in Britain up to the Shetland Islands so one might have expected to record it more often in VC60 than seems to be the case. There are seven locations recorded, all by JS: SD32: Lytham Hall woodland (28.5.00, 22.02.04, 08.07.12), SD45: Back Wood, Thurnham (18.07.12), SD53: woodland at Lower Brockholes (28.06.12), SD54: Nicky Nook, Scorton (14.05.06), SD56: Burton Wood, Aughton (27.04.99) & Gibson Wood, Quernmore (29.06.12), SD57: woodland south of Dalton (13.06.12). (Map 12)

***Geophilus truncorum* (Bergsö & Meinert)**

A relatively small species almost always (but not exclusively) recorded from more or less rural situations and typically found under dead bark and in leaf litter as well as on moorland and it is here recorded twelve times (all by JS) : SD32: Lytham Hall woodland, SD33: Starr Hills NR, St.Annes, track west of and wood by Queensway, St.Annes & Westby Wood, Weeton, SD43: Bucks Moss Salwick, SD45: Back Wood, Thurnham, SD53: Tun Brook Wood, SD54: Rough Hey Wood, Claughton-on-Brock, SD 55: Thorn Crag, Tarnbrook Fell, SD56: Gibson Wood, Quernmore & Claughton Moor, SD57: Dalton Crags. (Map 13)

SCOLOPENDROMORPHA

Family CRYPTOPIDAE

Cryptops hortensis (Donovan)

This is the smallest and commonest of our three "native" *Cryptops* species and records exist from as far north as NW Scotland. The other two species, *C.parisi* and *C.anomalans* are very much more southern in their distribution although the former has been found in Edinburgh and Aberdeen, the latter in Sheffield (and in Liverpool – see above) and either might possibly be found in urban sites in VC60. All three species are commonly associated with synanthropic sites although *C.hortensis* is sometimes found in rural localities. It is recorded here from nine locations - SD32: garden at St.Annes (4 times), Lytham foreshore, Lytham Hall woodland & near Fairhaven Lake, SD33: by railway, south of Squires Gate, SD34: cliffs at Norbreck, SD44: Winmarleigh Moss & relict mossland, Out Rawcliffe (all JS), SD47: Gait Barrows (ER). (Map 14)

LITHOBIOMORPHA

Family LITHOBIIDAE

Lithobius borealis Meinert

An animal mostly of rural sites including moorland in the west of Britain and found right up to the Shetland Islands. Older records of "Lithobius lapidicola" in Britain refer to this species. We have a single record from Arm Hill, south of Knott End in SD34 (01.03.09, JS). (Map 15)

Lithobius calcaratus C.L.Koch

A species with a reputation for occurring in rather dry sites such as limestone outcrops and dry heaths and which has never been found in Ireland. There are a number of records here including from limestone in SD57 at Dalton Crags (3) and SD64 at New Laund Hill, Whitewell (3) (both JS). Additionally from SD56: Winder Wood, Roeburndale, Cold Park Wood, Roeburndale & Crossgill Beck, Littledale (all JN), SD57: woodland south of Dalton (JS), SD65: Dale Beck Quarry, Botton Head Fell and in NY70 at Smardale Gill NNR (VC69) (both JN). (Map 16)

Lithobius crassipes L.Koch

This is the common small Lithobius in rural areas over much of Britain except in the SW, West Wales & W.Scotland (it is known in Ireland but mostly from the north). There are a total of 17 sites from which it is recorded: SD32: Royal Lytham golf course, dunes seaward of King Edward School, Fairhaven & Lytham Hall woodland (2), SD33: Starr Hills NR, St.Annes & field by site of Moss Side hospital, SD42: Warton Bank & Lea Marsh, SD43: Bucks Moss Wood, Salwick & Medlar Woods, SD44: Fowlers Hill Plantation, Cabus & Winmarleigh Moss, SD45: Bank Houses, Cockerham (2) (all JS), SD47: Warton Crag (both JN & JS), SD53: Tun Brook Wood (2), SD54: Castle Tarn, near Garstang (2), SD57: wasteland at Dock Acres (all JS) and SD 65: Dale Beck Quarry, Botton Head Fell (JN). (Map 17)

Lithobius forficatus (Linné)

The common large chestnut-brown Lithobius of most of Britain except in those occasional localities (mostly urban except in west Cornwall), where *Lithobius pilicornis* occurs.

Recorded here from the following sites (all JS unless indicated) SD32: St.Annes garden, wood by Queensway, St.Annes, Lytham Hall woodland & Royal Lytham golf course, SD33: Westby Wood, Weeton, Wildings Hill Wood, Mythop, Long Wood, Singleton & Woodland Gardens, Blackpool, SD34: by sea wall at Knott End, upper shore near Liscoe & wasteland at Fleetwood, SD42: Lea

Marsh (2), SD43: in old willow between Freckleton and Newton, Medlar Woods, track at Thistleton & Bucks Moss Wood, Salwick, SD44: Fowlers Hill plantation, Cabus, in mole hill debris in field at Out Rawcliffe, Winmarleigh Moss (8) & riverbank, St.Michaels-on-Wyre, SD 46: Fairfield Community Orchard, Lancaster (JN), SD 47: Quaker's Stang & Leighton Moss (both JN) & Gait Barrows (ER), SD53: Tun Brook Wood (4) & woodland at Lower Brockholes, SD54: Nicky Nook, Scorton & Rough Hey Wood, Claughton-on-Brock, SD55: Clougha summit (JN), SD56: Gibson Wood, Quernmore, Cole Wood, Aughton (JN), Caton Moor (JN), Burton Wood, Aughton, Lawsons Wood, Aughton, Claughton Moor (2) & Nottage Crag, Claughton, SD57: Dalton Crags (both JN & JS), Lord's Lot Wood, Over Kellet, wasteland at Dock Acres & woodland near river at Arkholme, SD64: New Laund Hill Whitewell, SD66: Hill Kirks Wood, Roeburndale (JN), SD67: Gragareth summit (JN). The apparent absence of this species from grid square SD45 is unlikely to be significant and further sampling should locate it here. (Map 19)

***Lithobius macilentus* L.Koch**

Represented in Britain by females only (males occur in France), this is patchily distributed and not recorded from SW England or Ireland. Recorded from a single locality here - Tun Brook Wood, east of Preston (17.05.08, 13.06.08, 20.09.08, 04.10.08), in SD53 - collected both by hand sorting and in pitfall traps (all JS). (Map 20)

***Lithobius melanops* Newport**

Typically a species of gardens and coastal areas but found elsewhere and sometimes found inside houses and other buildings. Records are from SD32: in old willow at Witch Wood Lytham, dunes seaward of King Edward School, Fairhaven, by upstairs window of house, St.Annes & upper salt marsh near Cookson's site, Lytham, SD33: seaward dunes at Starr Hills & Woodland Gardens, Blackpool, SD34: Rossall School grounds, SD42: upper salt marsh at Freckleton Naze & near Freckleton Creek, SD43: in wood debris at Ribby, SD45: wood by River Cocker, (all JS) SD56: bark trap at Shire Oaks Wood, near Aughton (JN), SD64: New Laund Hill, Whitewell (JS). (Map 21)

***Lithobius microps* Meinert**

A small species often found in gardens and urban areas. JS has recorded it in SD32: St.Annes garden (11.03.98, 09.04.00) & embankment below promenade seaward of KES, Fairhaven (29.06.12), SD33: by old building in field east of Queensway St.Annes (06.06.04) and in wood by Queensway, St.Annes (28.06.12), by ditch off School Road Marton (24.04.00), Starr Hills NR (11.03.01) & from mole nest debris in field near Weeton (28.04.00), SD42: wooded slope above Freckleton Pool (14.11.04), SD43: Carr House Green Common, Inskip (28.07.01) SD45: sea embankment, Glasson Dock (18.07.12). (Map 22)

***Lithobius variegatus* Leach**

A distinctive variegated and almost always rural animal often found on upland moor and in woodland in Britain (although seemingly absent from large areas of eastern England and much of Scotland).

Recorded from the following sites (all JS unless indicated): SD33: disused railway at Great Plumpton, SD34: Arm Hill, south of Knott End, SD42: woodland above Lea Marsh & plantation by Lea Gate Hotel, SD43: Bucks Moss Wood, Salwick (2 occasions), SD44: Winmarleigh Moss, SD47: Arnside Knott and Grubbins Wood, Arnside (both VC69) (ER), SD53: woodland at Lower Brockholes, Boilton Wood (JN) & Tun Brook Wood, SD54: Fowler's Hill plantation, Cabus, Rough Hey Wood, Claughton-on-Brock (2) & Bannister Hey Wood, Claughton-on-Brock, SD55: upper Thrush Clough, Tarnbrook Fell, SD56: Nottage Crag, Claughton, Shire Oaks Wood, Aughton (JN) (3 occasions), Cole Wood, Aughton & Gibson Wood, Quernmore, SD57: Lord's Lot Wood, Over Kellet, woodland south of Dalton & woodland near river at Arkholme, SD59: Lambrigg Fell (2) in VC69 (JN), SD65: Marshaw Fell (4) (JS) and (5) (JN), SD66: Whitray Beck, Botton and Middle Gill, Botton, Lowgill & Lythe Fell (all JN), SD67: Ireby Fell, SD77: Southerscales, Ingleborough in VC64 (mid-west Yorkshire) (JN), SD79: Wandale Beck in VC65 (JN).

Further records for VC69 (all JN) are NY30/NY40: Kirkstone Pass, NY41: Place Fell, Patterdale, NY60: Low Borrowbridge, NY70: Smardale Gill NNR. (Map 23)

Family HENICOPIDAE

Lamyctes emarginatus Newport

An animal often found in damper areas and rather seasonal in its occurrence; Barber & Keay (1988) report it nationally from most seasons of the year but comment on its tendency to occur in the autumn both here and in Sweden, Faeroes and Iceland. Our records, all by JS, are all from between July and September. Records are from SD33: damp field east of Queensway, St.Annes (20.09.08), SD34: under debris near Fleetwood Dock (18.09.04), on wasteland east of A585, Fleetwood (11.07.10), under stone by pool at Fleetwood Marsh (28.09.11), SD53: at water's edge, Lightfoot Green gravel extraction site (06.09.09). (Map 24)

SCUTIGEROMORPHA

Family SCUTIGERIDAE

Scutigera coleoptrata Linné

In the Lancashire Wildlife Journal of 1994 there is a report of a presumed specimen of this being found in a house at Seathwaite Avenue, Blackpool (Ainscough, 1994). It was on a bare plaster wall in a living room and the author of the article reports capturing it in a glass tumbler from which it climbed out, was subsequently captured in an envelope and released outdoors. The author reports that it was identified using the brief entry and illustration in Chinery (1986). The scutigeromorphs are so distinctive that it is unlikely to be anything other than one of these, presumably *S.coleoptrata* of which there are scattered indoor records from a variety of places in mainland Britain including, as indicated above, Greater Manchester and Merseyside (although a second species has recently been found in material imported from China). (Map 25)

DISCUSSION

The current list includes 20 species from outdoor sites in vice-county 60 together with a presumed Scutigera coleoptrata from indoors. From what we currently know of the distribution of our British species it contains few surprises. The list also has a relatively large number of records of our larger and more obvious types.

Not unexpectedly, *Lithobius variegatus* predominates in rural and more upland areas with *L.forficatus* often in more urban sites. *Lithobius borealis* and *L.crassipes* are roughly comparable in size and possibly of similar habits; examination of the distribution of these two rural species suggests a more easterly tendency for *L.crassipes* and a more westerly one for *L.borealis* but there are *L.crassipes* records scattered across much of Britain (except SW England) and *L.borealis* has been recorded right across Britain and Ireland.

Of the other British species, the two terrestrial *Strigamia* species always seem patchy in their occurrence and their ecology is not clear: *Strigamia acuminata* is known from localities as far north as Cumbria and Yorkshire and is recorded twice in the JS, JN, ER studies and had been previously found in VC60. *Strigamia crassipes* (C.L.Koch) although known from central Scotland has otherwise a more southern distribution according to current records.

Lithobius curtipes C.L.Koch, not always easy to distinguish from *L.crassipes*, has scattered records as far north as southern Scotland and there are records by C.Felton from Hutton Roof Crags, close to the border with Lancashire and from Burns Beck Moss, near Killington (both in VC69) in 2001 so its occurrence in VC60 might be predicted (Map 18). *Geophilus osquidatum* Brolemann, generally south-western, has been recorded from Shropshire and also from Workington in VC70 (Cumberland) so it might be found in Lancashire and *Lithobius muticus* C.L.Koch, mostly recorded from SE England, has been found in the Rotherham area and in rural sites in both Cheshire and Derbyshire.

There are several species that might possibly be found in VC60 in synanthropic habitats. These include *Schendyla dentata* (Brolemann.& Ribaut) (known from Shropshire & Lothians amongst other locations), *Henia vesuviana* (recorded as far north as Cheshire), *Stenotaenia linearis* (C.L.Koch) (old records by R.S.Bagnall from Darwen, Sewerby, Ryhope Dene and Hexham) and *Lithobius pilicornis* (Newport) (SW England & SW Wales but urban sites elsewhere including Sheffield and Wakefield). Of the two larger *Cryptops* species, *Cryptops parisi*, although mostly southern, has been found in both Edinburgh and Aberdeen whilst *Cryptops anomalans* Newport is known in Sheffield and, as recorded above, Merseyside. *Lithobius lapidicola* Meinert, only known outdoors from the coasts of Suffolk and Kent, has been found in greenhouses elsewhere including North Wales (Bangor) and Edinburgh.

Apart from *Strigamia maritima* there also remains the possibility of other halophiles such as *Hydroschendyla submarina* (Grube) (known from Yorkshire, etc. but always difficult to find since it favours rock crevices) and *Geophilus gracilis* Meinert which is known from the Isle of Man and from Ravenglass (VC70) as well as other coastlines and could well be found on the Lancashire coast. There is also the possibility of hot-house exotics in suitable places such as subtropical / tropical greenhouses.

ACKNOWLEDGEMENTS

All those individuals named above either for providing specimens or for giving access to their records, to Graham Proudlove of Manchester for the cave records and to Biological Records Centre, Wallingford for spreadsheets of records including those from VC's 59 and 60. The distribution maps have been plotted for us by Steve Gregory using the DMAP mapping programme developed by Alan J. Morton.

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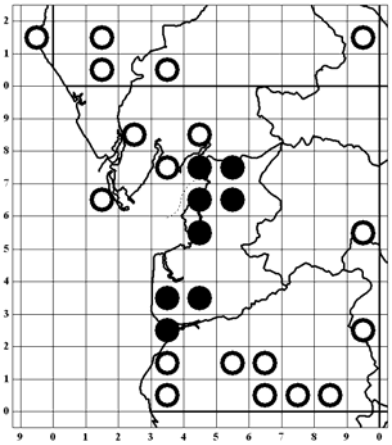
DISTRIBUTION MAPS OF CENTIPEDES FROM THE FYLDE COAST AND ADJACENT AREAS (POST-1960)

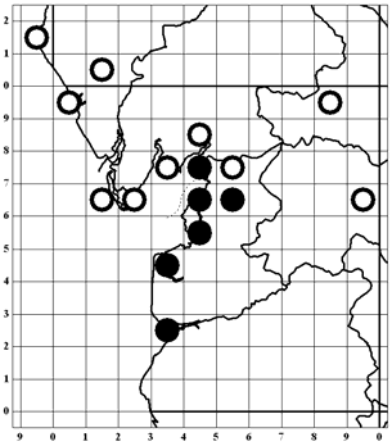
Maps show 10km National Grid grid square records from 1960 onwards only.

Solid dots [●] represent records from vice-county 60 (West Lancashire),

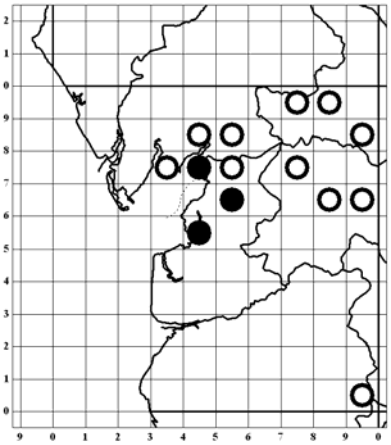
Open circles [O] other records from nearby areas in 100km NG squares SD (34) and part of NY (35).



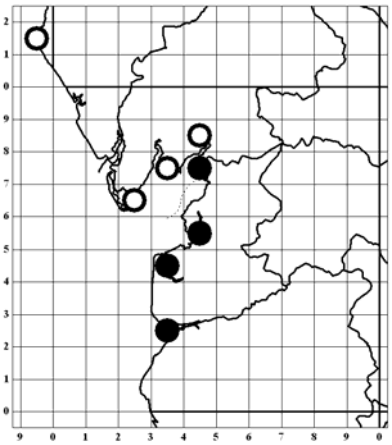
MAP 3: ***Stigmatogaster subterranea***



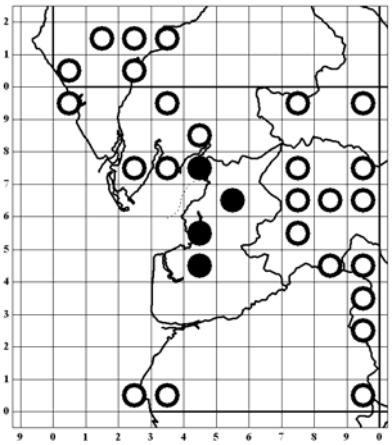
MAP 4: ***Schendyla nemorensis***



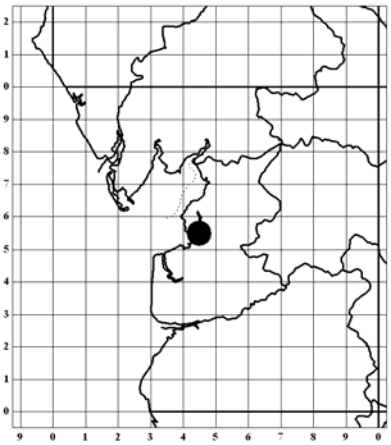
MAP 5: ***Strigamia acuminata***



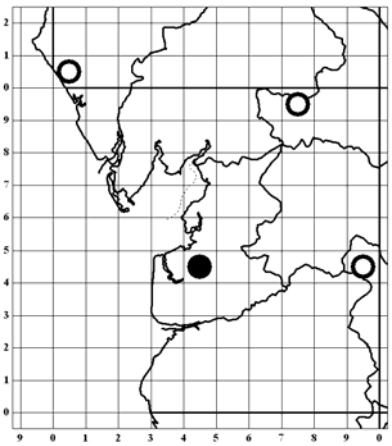
MAP 6: ***Strigamia maritima***



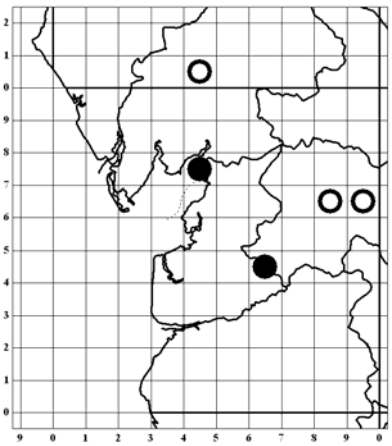
MAP 7: ***Geophilus carpophagus*** **sl**



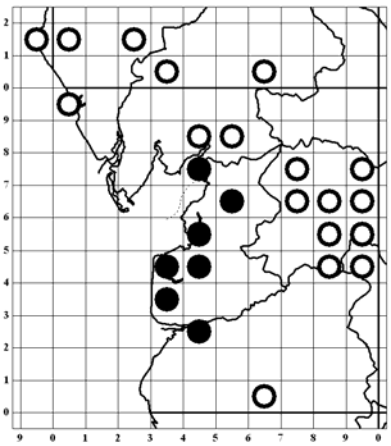
MAP 8: ***Geophilus carpophagus*** **ss**



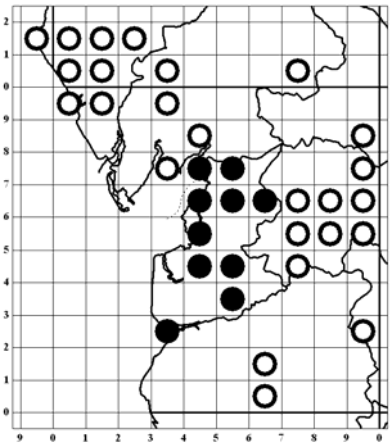
MAP 9: ***Geophilus easoni***



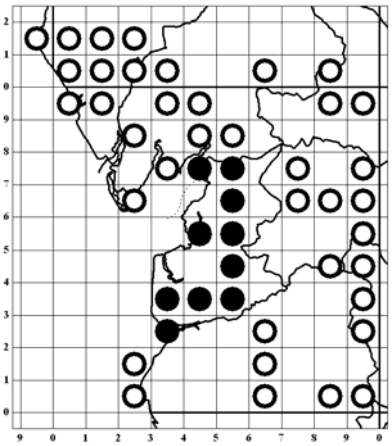
MAP 10: ***Geophilus electricus***



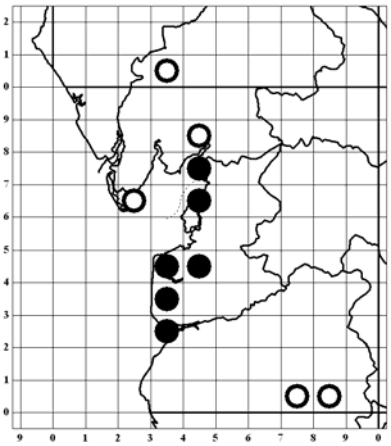
MAP 11: ***Geophilus flavus***



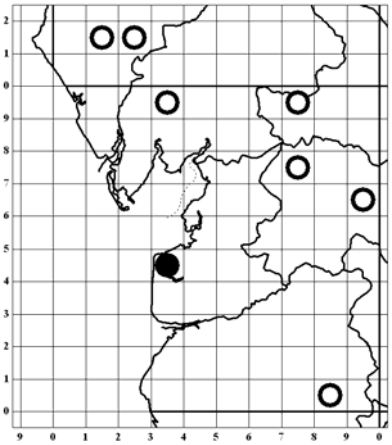
MAP 12: *Geophilus insculptus*



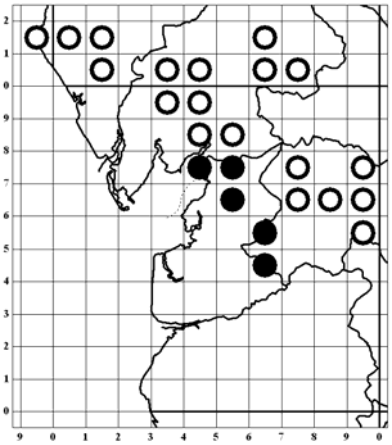
MAP 13: *Geophilus truncorum*



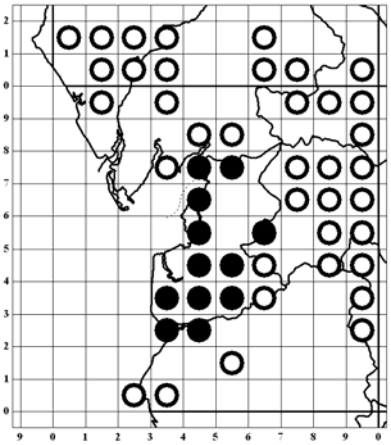
MAP 14: *Cryptops hortensis*



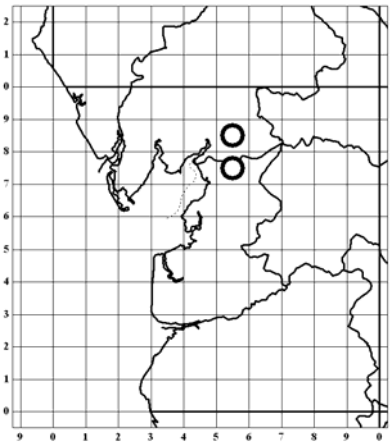
MAP 15: *Lithobius borealis*



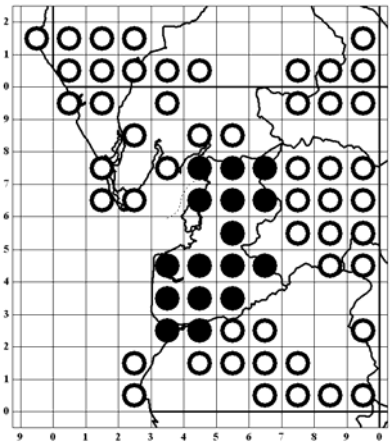
MAP 16: *Lithobius calcaratus*



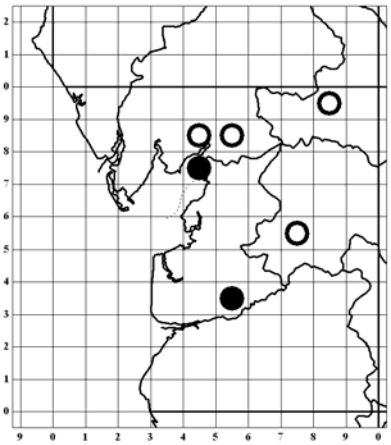
MAP 17: *Lithobius crassipes*



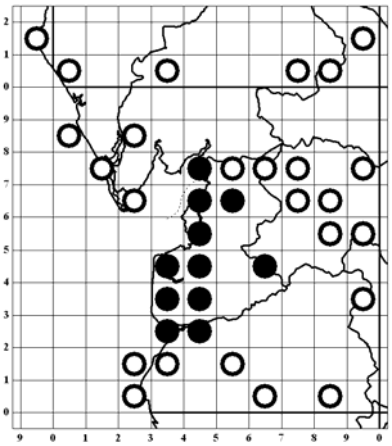
MAP 18: *Lithobius curtipes*



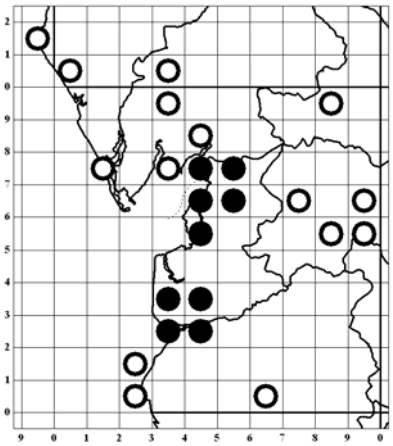
MAP 19: *Lithobius forficatus*



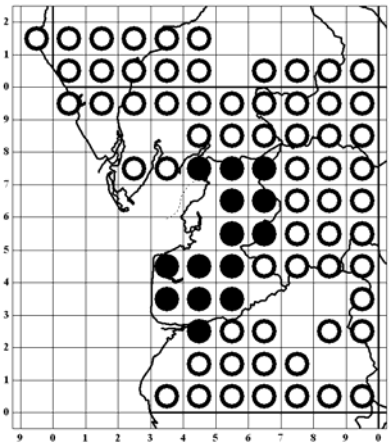
MAP 20: *Lithobius macilentus*



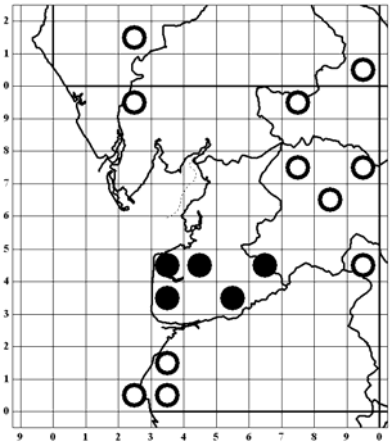
MAP 21: ***Lithobius melanops***



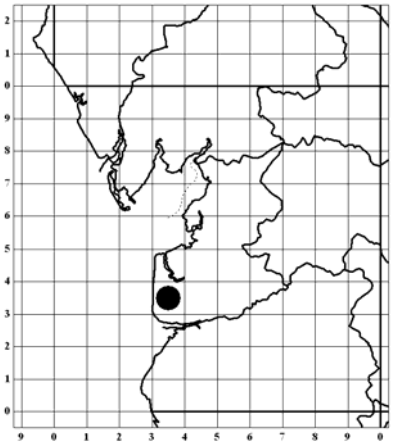
MAP 22: ***Lithobius microps***



MAP 23: ***Lithobius variegatus***



MAP 24: ***Lamyctes emarginatus***



MAP 25: ***Scutigera coleoptrata***

THE ALTITUDINAL RANGE OF *POLYXENUS LAGURUS* (LINNÉ) IN BRITAIN

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INTRODUCTION

Having found bristly millipedes at 170m on the edge of the Dartmoor National Park during 2011, I began to wonder how high the species has been found in Britain. Its generally southern and coastal distribution would suggest that it is effectively confined to the lowlands. It seemed worthwhile therefore to examine the data collated for the *Atlas* (Lee, 2006). This includes much altitudinal data although only about 50% of records actually contain this information.

THE DATA

Examination of the *Atlas* data found that 180 records provide altitude data. These range from sea level to 600m but with 90% at or below 100m. The distribution is shown in Fig. 1 and clearly shows that this millipede is primarily found at low altitude in Britain but can on occasion be found at higher altitudes.

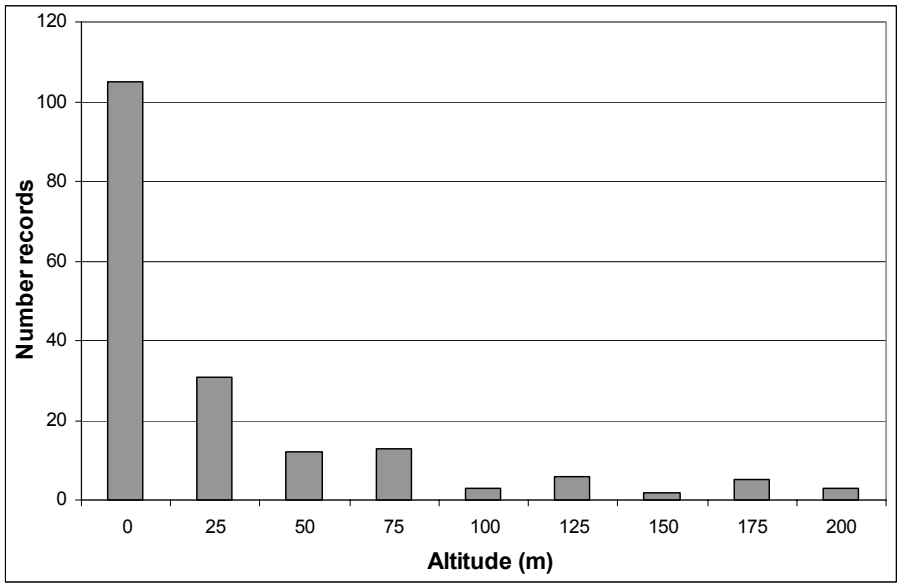

FIGURE 1: Altitudinal range of *Polyxenus lagurus* in Britain
Each bar represents a 25m altitude range, while the final bar represents all records in excess of 200m.

The particular circumstances of the higher altitude records are interesting to examine in some detail. The two highest altitude records – 600m and 540m – are from the same site: Tarren yr Esgob (VC42) in the Black Mountains of South Wales. The Tarren is a north-east facing crag of Old Red Sandstone with boulder-strewn steep talus slopes below. Three separate recorders were involved and two dates. It is fortunate that a good habitat description is available (Harding, 2006) as the site is famous for its population of the rare pill woodlouse *Armadillidium pictum* Brandt: the escarpment is over 4km long, the rocks of the Lower Old Red Sandstone continental facies surface as a range of outcrops and cliffs, including some calcareous cornstones.

The next height records are much lower, 200 or less, and come from Dartmoor. The fact that the highest records come from the south west of Britain is not surprising as the south east is a generally lowland area. Interestingly though, it has also recently been found at about 210m in the Chiltern Hills, in the south east (M. Harvey, pers. comm.).

Although primarily known in Scotland from coastal areas, it has recently been found at 220m at Cambus o'May near Ballater in Aberdeenshire (M. Davidson, pers. comm.). This was in pine litter, which is a previously unrecognized habitat type for the species. Presumably it feeds here on micro-organisms encrusting the surfaces of the dead pine needles and perhaps fallen twigs. This suggests that it might also be present more widely in higher pinewoods on Deeside and Speyside. Two uncategorized habitat records are listed in Alexander (2006) – from heather and from a dead grass blade. These may be consistent with the pine litter situation. However, it has not been reported from broad-leaved woodland leaf litter – even in well-lit situations - nor from grass litter, and so its presence in pine litter is intriguing. Kime & Enghoff (2011) mention that relict populations in the south of the Middle-Russian Upland live in hard shrubby litter on limestone denudations. So a litter association does seem to be widespread, albeit poorly understood at present.

DISCUSSION

Alexander (2006) reviewed the habitat preferences in Britain and showed that - when occurring away from trees - the millipedes are generally found on dry rocky hillsides or the maritime therophyte zone on rocky seacliffs. Exposed bedrock is very much a feature of the north and west in Britain, although the chalk ridges of the SE – including the Chilterns - also include areas of exposed rock. Examination of the altitude data suggest that *Polyxenus lagurus* is merely occurring on suitable rocky areas within its geographical range. It is perhaps the geography of the landscape that determines its presence or absence rather than altitude.

This conclusion is consistent with experiences elsewhere across Europe. The European Atlas (Kime & Enghoff, 2011) mentions the highest altitudes at which it has been found as 1700m in the Swiss Alps and 2600m in Bulgaria.

However Fig. 1 is by no means representative of the frequency of exposed bedrock within southern Britain; there is clearly a strong bias in favour of exposed rock at lower altitudes. It seems likely that - although exposed rock is most frequent at higher altitudes - these are in some way sub-optimal for *Polyxenus lagurus*. Microclimate must be the answer, that the milder climate of the coastal rocky zone provides greater opportunities than the relatively cold rocky hillside situations with their exposure to prolonged winter cold.

ACKNOWLEDGEMENTS

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THE OCCURRENCE OF TWO ELUSIVE WOODLICE, *METATRICHONISCOIDES LEYDIGII* (WEBER, 1880) AND *TRICHONISCOIDES SARSI* PATIENCE 1908, IN SEMI-NATURAL HABITAT IN KENT.

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ABSTRACT

Metatrichoniscoides leydigii (Weber, 1880) and *Trichoniscoides sarsi* Patience, 1908 are recorded from a Site of Special Scientific Interest beside the River Medway in Kent. This is the second British record for *M. leydigii* and its first recorded occurrence from semi-natural habitat. *T. sarsi* is also typically synanthropic in Britain. Figures of male sexual characters, drawn from Kent specimens are given. The occurrence of both species, in close association and in habitat similar to that described for native populations in the Netherlands suggest that this Medway population may be of native occurrence, rather than a recent human-assisted introduction. It is suggested that these elusive species may have been overlooked and may occur more widely along the low-lying eastern parts of Britain.

INTRODUCTION

On current evidence, the trichoniscid woodlice *Metatrichoniscoides leydigii* (Weber, 1880) and *Trichoniscoides sarsi* Patience, 1908 are heavily synanthropic in Britain (Gregory, 2009). First recorded in Britain by the author in 1989, *M. leydigii* was hand sorted from among compost-rich gravel and rubble at a garden centre in Oxford (Hopkin, 1990; Gregory, 2009). It was almost certainly unintentionally introduced to this site and its occurrence here, at its only known British locality, was quite correctly considered to be of 'no conservation significance'. Recently, *M. leydigii* was included on the Non-native Species Register compiled by the GB Non-native Species Secretariat (https://secure.fera.defra.gov.uk/nonnativespecies/), which comprises species introduced into Britain. Across much of its British range *T. sarsi* is also associated with synanthropic sites, such as old gardens or churchyards, typically in the environs of towns and villages (Gregory, 2009). This preference for disturbed sites has been taken to imply that *T. sarsi* is a well-established non-native introduction in Britain.

During the 2011 BMIG spring field-meeting to Kent surveys were undertaken to search for the elusive UK BAP millipede *Metaiulus pratensis*, Blower & Rolfe. On 17th April 2011 a visit was made to Abbey Mead Lakes, near Snodland, part of a larger Site of Special Scientific Interest Holborough to Burham Marshes SSSI, which lies along the flood plain of the River Medway. In addition to flooded gravel pits, which are important for over-wintering wildfowl, there is a variety of other habitats represented at Abbey Mead Lakes, including extensive reedbeds (subject to occasional tidal flooding), open water, fen, grassland, scrub and woodland.

RESULTS

One site surveyed by the author was a reedbed bordering the River Medway (TQ/712613, vc 16, alt. <5m). Lifting a piece of rubble embedded into peaty soil revealed two trichoniscid woodlice. The first, a relatively large (3.5 mm in length) and darkly pigmented species, proved to be a female *Trichoniscoides albidus*. The second specimen was much smaller (about 2 mm) and pure white in colour. Examination with a handlens indicated that the body was covered with conspicuous tubercles and it seemed to lack ocelli. This specimen proved to be a male and dissection of the pleopods

confirmed the identity as *M. leydigii* Weber (Fig. 1). This is the second British record, and the first record from a semi-natural habitat.

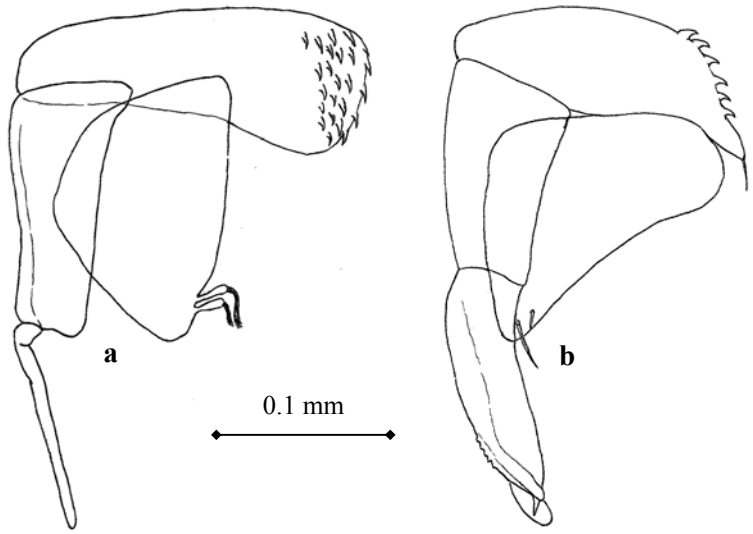

FIGURE 1: *Metatrichoniscoides leydigii* Weber, male, from Abbey Meads Lakes SSSI, Kent.
a) First pleopod; b) Second pleopod

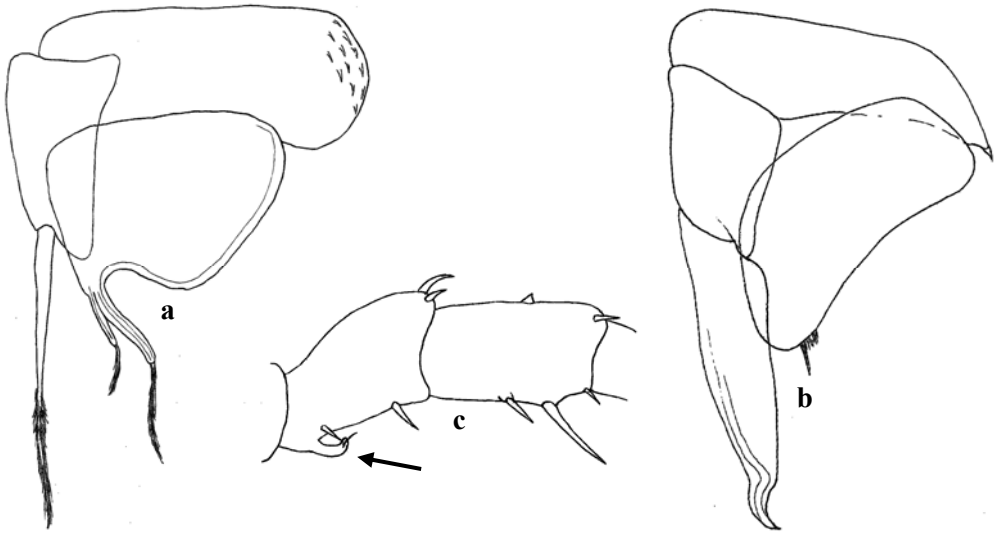

FIGURE 2: *Trichoniscoides sarsi* Patience, male, from Abbey Meads Lakes SSSI, Kent.
a) First pleopod; b) Second pleopod; c) Merus and carpus of seventh pereiopod.
Note prominent hooked spur at base of merus (arrowed).

Nearby hand-sorting strandline debris on the banks of the River Medway revealed *Haplophthalmus danicus* and *Trichoniscus pusillus* sensu lato to be frequent throughout the 10cm depth of strandline debris. However, the removal of stones partially embedded in silty clay below this accumulated strandline revealed two pale orange trichoniscids about 3 mm in length. These were somewhat reminiscent of juvenile *Androniscus dentiger*, but appeared to have red ocelli. Dissection of the male specimen (the second was female) proved the identity to be *Trichoniscoides sarsi* Patience (Fig. 2).

Further examination of the male *T. sarsi* specimen indicates that this species can be readily separated from other species of *Trichoniscoides* known to occur in Britain by examination of the male seventh pereiopod. In *T. sarsi* there is a curved projection protruding from the underside of the merus (Fig.

2c), which can be readily seen without dissection of the specimen. Although clearly figured in Vandel (1960), and mentioned by Oliver & Meechan (1993) and by David Bilton in BISG newsletter 35 (Bilton, 1993), this useful character has never been illustrated in available British identification keys, including Steve Hopkin's AIDGAP key (Hopkin, 1991). This projection is absent in *T. saeroeensis* and *T. helveticus*, which both bear a superficial resemblance to *T. sarsi*. However, it should be borne in mind that there are other species of *Trichoniscoides* in Europe that also have a similar projection on the merus of the seventh male pereiopod (i.e. those species belonging to Vandel's (1960) groupe *aquitano-lanquedocien*, with a distribution centred on the western Pyrenees). Some of these species could be found in Britain, and it is, therefore, always good practice to examine male pleopods.

DISCUSSION

M. leydigii was described new to science from the coast of the Zuidersea in the Netherlands in 1880 and through the recent activities of Dutch 'soilfaunagroup' it has become clear that it is quite widespread and frequent in the Netherlands (Berg *et al*, 2008). T. sarsi also has a wide distribution in the Netherlands, primarily associated with low-lying areas overlain by Holocene deposits of marine origin (Berg *et al*, 2008). Both species share similar habitat preferences, being found deep within clayey soil or beneath embedded rocks along roadsides, riverbanks, ditches, sea dikes, occasionally associated with the supralittoral zone on the coast. Both *M. leydigii* and *T. sarsi* are often associated with each other, and typically occur with other trichoniscids, such as *T. albidus* and *H. mengii*. As native species both are known from north-west Europe: western France (*M. leydigii*), northern France (*T. sarsi*), Belgium (both species), western Germany (both species) and (in the case of *T. sarsi*) as far north as southern Scandinavia (Berg *et al*, 2008; Schmalfuss, 2003). Both have been introduced to other countries, where they sometimes occur inside glass-houses.

Historically there has been much industry in the Medway Valley in the environs of Snodland. Lime workings and paper mills have been active for centuries, and these industries expanded dramatically in the 19th Century when the railway was built. A working paper mill is located adjacent to Abbey Mead Lakes. Thus there has been plenty of scope for introduction for synanthropic species, and it is possible that both *M. leydigii* and *T. sarsi* have been introduced here as a result of human activities (such as reported by Berg *et al* (2008) for *T. sarsi* in the Netherlands). However, there are no obviously dispersal links between the Medway Valley and the low countries of Netherlands and Belgium where these species are known to be native.

A second possibility is that Abbey Meads Lakes supports a native population of both species that have colonised naturally after the end of the last glacial period. In terms of both the habitat, and the associated species, Abbey Meads Lakes (a designated SSSI) is strikingly similar to that described for the native populations of *M. leydigii* and *T. sarsi* in the Netherlands on the opposite side of the North Sea (Berg *et al*, 2008). Thus, it is probable that both species are actually native to at least south-eastern England and further, previously over-looked, populations of *M. leydigii* may be occur in semi-natural habitats in other low-lying areas along the eastern coasts of Kent and East Anglia. In light of Mike Davidson's recent discovery of *T. sarsi* on the coast of Kincardineshire, eastern Scotland (Davidson, 2011), this latter species could prove to be widespread in eastern Britain, in both semi-natural habitat in coastal areas and synanthropic sites inland. Both species have subsequently secondarily colonised synanthropic habitats in Britain (as reported by Gregory, 2009).

It cannot be assumed that all small white woodlice with red eyes found on the coast are *T. saeroeensis.* Reliable determinations can only be based on examination of male specimens. Other species, such as *M. leydigii*, *M. celticus* Oliver & Trew, *T. sarsi*, or even another cryptic species new to Britain, could be present. In the Netherlands, where male specimens are routinely dissected, *T. saeroeensis* has never been recorded. It is possible that this species occupies a different niche to *M. leydigii* and *T. sarsi*, but there is insufficient field data to draw solid conclusions.

Based on its initial recorded occurrence at the garden centre in Oxford (which has been demolished), *M. leydigii* has been included on the Non-native Species Register compiled by the GB Non-native Species Secretariat (https://secure .fera.defra.gov.uk/nonnativespecies/). This list includes invasive non-native species, such as Japanese Knotweed or Harlequin Ladybird, that have the ability to spread causing damage to the environment, the economy, our health and the way we live. The validity of the inclusion of *M. leydigii* on the Non-native Species Register is now in doubt. As a native species its distribution is entirely restricted to the coastal regions of our neighbouring countries on the opposite side of the English Channel and the North Sea. It is not unexpected for it to occur as a native species in Britain. In light of this reported at occurrence of *M. leydigii* at Abbey Mead Lakes it does appear to be native in at least south-east England, but it has undoubtedly been spread beyond its natural range by human activity (as with many invertebrates with synanthropic tendencies). If native these Abbey Mead Lakes populations of *M. leydigii* and *T. sarsi* are likely to be of considerable conservation interest.

ACKNOWLEDGEMENTS

I am grateful to Paul Lee for organising access to the site, and to Martine Jonker for translating the relevant species accounts in the Dutch Atlas (Berg *et al*, 2008).

More information about the woodlouse fauna of the Netherlands can be found at: http://www.pissebeddenproject.nl/ (text in Dutch, but with excellent images of species).

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FIELD MEETING REPORTS

MILLIPEDES FROM NORTH WALES: A REPORT ON THE BMIG 2010 FIELD MEETING

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INTRODUCTION

Although moderate species lists existed for millipedes in vice-counties Denbigh (VC 50) and Flint (VC 51) prior to the 2010 British Myriapod and Isopod Group (BMIG) meeting, relatively few records had been published in any format. Table 1 summarises information held on the BRC database (as used to produce the millipede atlas (Lee, 2006)) on the earliest record of each species from each of the vice-counties.

The very earliest records, from 1912, are given as *Cylindroiulus latestriatus* and *Ommatoiulus sabulosus* collected by AR Jackson from Saltney Ferry (SJ3665) in VC51. Although the records are listed as having been derived from literature, I have been unable to track down the original reference. No more records are available for either vice-county until 1949 when several more species were collected from VC51 by HM Butler. All of these specimens were identified by Gordon Blower who also added *Polydesmus denticulatus* to the vice-county list in 1952. It was not until 1960 that the first records were made for VC50 when HW Walden collected specimens from Conway Falls (SH810535) that were later determined by CP Fairhurst as *Ophyiulus pilosus* and *Polydesmus angustus*.

TABLE 1: The earliest known records of millipede species from Denbigh (VC50) and Flint (VC51)

	Denbigh VC50	Flint VC51
Allajulus nitidus		1984
Blaniulus guttulatus	1972	
Brachydesmus superus		1949
Chordeuma proximum	1987	
Cylindroiulus britannicus	1987	1987
Cylindroiulus latestriatus		1912
Cylindroiulus punctatus	1961	1949
Glomeris marginata	1961	1949
Julus scandinavius	1961	1991
Melogona gallica	1974	1974
Nanogona polydesmoides	1961	1984
Ommatoiulus sabulosus	1962	1912
Ophyiulus pilosus	1960	1949
Polydesmus angustus	1960	1949
Polydesmus coriaceus	1962	
Polydesmus denticulatus	1961	1952
Proteroiulus fuscus	1972	1987
Tachypodoiulus niger	1967	1949

The number of species known from Denbigh then increased significantly in 1961/2 when Pearson and White (1964) undertook a pitfall survey of surface-active arthropods on moorland on Moel-y-Gamelin (SJ1746). Their collections included ten species of millipede, seven of which were new to Denbigh. CP Fairhurst took the VC50 list to double figures when he collected *Tachypodoiulus niger* from Llanferes (SJ2059) in 1967, added *Proteroiulus fuscus* from Carrog (SJ1143) in 1972 and then EG Hancock recorded *Blaniulus guttulatus* from Llangollen (SJ24) in the same year. In 1974 J Chatfield collected a *Melogona* from Llanrwst, Denbigh (SH8062) and in the same year CRC Paul collected a *Melogona* from Nant Alyn (SJ16) in Flint. The millipedes were determined as *M. gallica* by CP Fairhurst but if the original specimens exist they would need to be checked in the light of the subsequent discovery of *M. voigti* in Britain (Corbet, 1996).

There appear to be no further records from either vice-county until 1984 when the North Wales Naturalists' Trust visited Ddol Uchaf NR (SJ17) in Flint (Morgan, 1985). Mrs MJ Morgan is reported as recording *Allajulus nitidus*, the first time the millipede had been seen in Wales. Other species reported from the same visit included *Ommatoiulus sabulosus*, *Nanogona polydesmoides* and *Glomeris marginata*. In 1987 C Felton collected *Chordeuma proximum* and *Cylindroiulus britannicus* from Bontuchel (SJ0858) in Denbigh and *Cylindroiulus britannicus* and *Proteroiulus fuscus* from Northop (SJ 2369) in Flint. Although the Welsh Peatland Invertebrate Survey (Holmes *et al.,* 1995) included pitfall trapping on Sontley Marsh (SJ339477) in Denbigh during 1988, there were no species added to the vice-county list (only four species of millipede were recorded) so the total number of species recorded from VC50 has remained at 15 since 1987. The most recent addition to the species recorded from Flint is *Julus scandinavius* reported from Coed-y-Felin (SJ1967) by Mrs MJ Morgan in 1991. This brought to 15 the total number of species recorded from VC51 also.

MILLIPEDES

The 2010 BMIG field weekend, held from 8th to 11th April, was based at St Deiniol's (now Gladstone's) Library, Hawarden. Over the weekend seventeen different locations were visited in the two vice-counties of Denbigh (50) and Flint (51). These sites covered eleven different hectads from which 29 species of millipede were collected. Specimens that appeared to be attributable to a thirtieth species, *Leptoiulus kervillei*, could not be identified with certainty in the absence of a male.

Details of the sites visited are given in Table 2 and of species collected in Table 3. No species of millipede were collected from Talacre. Even the richest natural and semi-natural sites such as the limestone pavement at Eyarth Rocks nature reserve (11 species) and the woodland at Coed y Felin (10 species) appeared species poor in comparison with the synanthropic sites such as Erdigg gardens (20 species) and Marford sand pit (16 species). However, the impact of recorder effort has to be taken into account as all participants in the meeting visited Erdigg and Marford before dispersing to other sites.

Updated lists of species totals for each vice-county are given in table 4. The BMIG visit almost doubled the total number of species known from each vice-county, to 28 in Denbigh and 27 in Flint. In addition, the presence of *Melogona gallica s.s.* in both Denbigh and Flint was confirmed. The most notable find from the meeting would have been *Leptoiulus kervillei* had it been possible to confirm the identification. *L. kervillei* has a southern distribution in Britain and Marford sand pit would be one of its most northerly locations, not just in Britain but in Europe as well where it only occurs along the Atlantic fringe to the Low Countries (Kime, 1999). Another possible northern location has been reported from Dolgoch Quarry, Shropshire recently but again the lack of a male specimen means the record has not been confirmed (JP Richards, pers. comm.). *L. belgicus* is less southern in its distribution with records from recent years in western Scotland. However, there are still few records in northern Wales and the addition of the species to both vice-county lists was notable.

TABLE 2: Details of sites visited

Recorders: Tony Barber (TB), Glyn Collinson (GC), Mike Davidson (MD), Steve Gregory (SG), Paul Harding (PTH), Angela Lidgett (AL), Paul Lee (PL), Peter Nicholson (PN), Helen Read (HR), Paul Richards (JPR), Duncan Sivell (DS).

Site Code	Location	Habitat	Grid reference	VC	Date(s)	Recorder(s)
1	Erdigg		SJ3248	50	09.iv.2010	TB, MD, SG, AL, PL, PN, HR, JPR, DS
2a	Marford	sand pit	SJ3555	50	09.iv.2010	MD, SG, PTH, PL
2b	Marford	sand pit	SJ3556	50	09.iv.2010	TB, AL, PN, JPR
2c	Marford	sand pit	SJ3656	50	09.iv.2010	DS
3a	Eyarth Rocks NR	limestone pavement	SJ1254	50	10.iv.2010	TB, GC, PTH, PL, PN
3b	Coed Cilygroeslywd	woodland	SJ1255	50	10.iv.2010	PTH, PL
4	Y Ddol Uchaf	old quarry	SJ142713	51	10.iv.2010	TB, PN
5	Kinmel Dunes NR	dunes	SH989807	50	10.iv.2010	SG, JPR
6	Towyn	churchyard	SH9779	50	10.iv.2010	SG, JPR
8	Point of Ayr	saltmarsh	SJ1284	51	10.iv.2010	MD, SG, JPR, DS
9	Ffrith beach, Prestatyn	dunes	SJ039826	51	10.iv.2010	SG, JPR
10	Cave Quarry, Dyserth		SJ060788	51	10.iv.2010	SG, JPR
11a	Cwm	churchyard	SJ0677	51	10.iv.2010	MD, AL
11b	Cwm	churchyard	SJ0678	51	10.iv.2010	HR
12a	Coed y Felin, Mold	woodland	SJ1967	51	10.iv.2010	MD, AL
12b	Coed y Felin, Mold	woodland	SJ1968	51	10.iv.2010	HR
13a	Y Graig		SJ0872	50	10.iv.2010	MD, HR
13b	Y Graig		SJ0873	50	10.iv.2010	HR
14	Hawarden		SJ3165	51	08-11.iv.2010	TB, SG, JPR
15	Bank Farm, Penymynydd		SJ310622	51	11.iv.2010	JPR
16	White Gate Farm, Hope		SJ310595		11.iv.2010	JPR

CENTIPEDES: A CORRECTION

Barber and Gregory (2011) reported on the centipedes, woodlice and waterlice collected during the Hawarden meeting. In their report it was stated that I had previously collected *Geophilus osquidatum* from Shropshire. In fact this specimen was both collected (from Preston Montford, Shrewsbury) and determined by Kevin Clements although I did confirm his identification before the record was submitted to the recording scheme.

ACKNOWLEDGEMENTS

Thanks to Tony Barber, Duncan Sivell, Glyn Collis, Mike Davidson, Steve Gregory, Paul Harding, Angela Lidgett, Peter Nicholson, Helen Read, and Paul Richards for submitting their records. Also thanks to Paul Harding for organising the meeting.

TABLE 3: Species recorded from each site (site details are given in TABLE 2)

Location(site code):	1	2a	2b	2c	3a	3b	4	5	6	8	9	10	11a	11b	12a	12b	13a	13b	14	15	16
Glomeris marginata		#	#		#	#	#			#		#			#	#	#	#	#		
Nanogona polydesmoides	#	#															#		#		
Brachychaeteuma melanops	#																				
Brachychaeteuma bradeae																			#		
Chordeuma proximum		#	#																		
Melogona scutellaris	#	#																			
Melogona gallica					#		#										#				
Proteroiulus fuscus	#	#					#			#			#	#							
Choneiulus palmatus	#	#											#						#		
Blaniulus guttulatus	#	#	#		#				#	#		#	#		#	#			#		
Archiboreoiulus pallidus															#						
Boreoiulus tenuis	#		#				#					#							#		
Tachypodoiulus niger	#	#	#		#	#	#	#	#	#	#	#		#		#	#	#	#	#	
Ommatoiulus sabulosus	#																				
Ophyiulus pilosus	#	#	#	#	#		#	#	#	#		#	#	#	#	#	#		#	#	
Julus scandinavius	#				#		#				#	#					#		#		
Leptoiulus belgicus	#	#					#														
Leptoiulus ?kervillei					#																
Cylindroiulus britannicus	#		#			#	#					#			#	#			#	#	
Cylindroiulus latestriatus		#		#				#		#	#										
Cylindroiulus parisiorum	#																				
Cylindroiulus punctatus	#	#	#		#	#	#			#				#	#	#	#		#	#	
Brachyiulus pusillus			#																#		
Brachydesmus superus	#									#						#			#	#	
Polydesmus angustus	#	#	#			#	#			#	#	#	#		#				#		
Polydesmus coriaceus	#				#	#	#						#							#	#
Polydesmus inconstans	#						#								#						
Ophiodesmus albonanus													#				#		#		
Macrosternodesmus palicola	#													#					#	#	

TABLE 4: Updated list of millipedes recorded from Denbigh and Flint

	Denbigh VC50	Flint VC51
Allajulus nitidus		1984
Archiboreoiulus pallidus		**2010**
Blaniulus guttulatus	1972	**2010**
Boreoiulus tenuis	**2010**	**2010**
Brachychaeteuma bradeae		**2010**
Brachychaeteuma melanops	**2010**	
Brachydesmus superus	**2010**	1949
Brachyiulus pusillus	**2010**	**2010**
Choneiulus palmatus	**2010**	**2010**
Chordeuma proximum	1987	
Cylindroiulus britannicus	1987	1987
Cylindroiulus latestriatus	**2010**	1912
Cylindroiulus parisiorum	**2010**	
Cylindroiulus punctatus	1962	1949
Glomeris marginata	1962	1949
Julus scandinavius	1962	1991
Leptoiulus belgicus	**2010**	**2010**
Leptoiulus ?kervillei	**2010**	
Macrosternodesmus palicola	**2010**	**2010**
Melogona gallica s.l.	1974	1974
Melogona gallica s.s.	**2010**	**2010**
Melogona scutellaris	**2010**	
Nanogona polydesmoides	1962	1984
Ommatoiulus sabulosus	1962	1912
Ophiodesmus albonanus	**2010**	**2010**
Ophyiulus pilosus	1960	1949
Polydesmus angustus	1960	1949
Polydesmus coriaceus	1962	**2010**
Polydesmus denticulatus	1962	1952
Polydesmus inconstans	**2010**	**2010**
Proteroiulus fuscus	1972	1987
Tachypodoiulus niger	1967	1949

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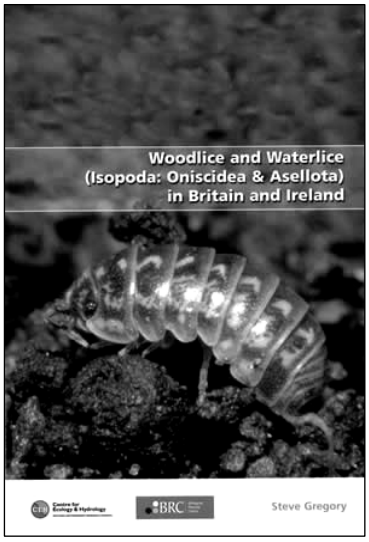
BOOK REVIEWS



WOODLICE AND WATERLICE (ISOPODA & ASELLOTA) IN BRITAIN AND IRELAND

By Steve Gregory

Published by the Field Studies Council of behalf of the Centre for Ecology & Hydrology's Biological Records Centre (2009).

ISBN 978-0-9557672-8-9, 176pp, 39 colour photos, 53 black and white maps, **£19.50**

Includes species descriptions, distribution maps, chapters on recording in Britain and Ireland, habitats, biogeography, conservation, and collecting and recording, colour photos of many species and bibliography.

This atlas can be purchased from the Biological Records Centre: *http://www.ceh.ac.uk/products/publications/WoodliceandWaterlice2009.html*

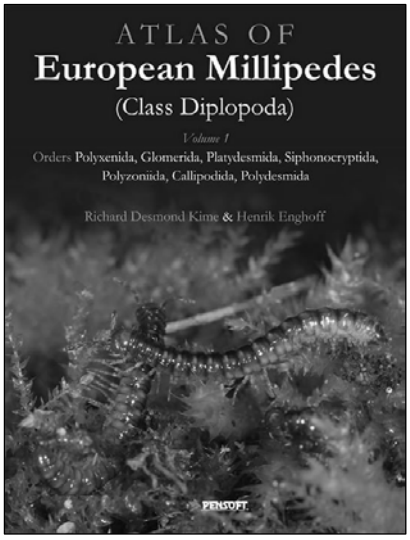
The following review is taken from the Foreword to *Woodlice and Waterlice (Isopoda & Asellota) in Britain and Ireland* written by Chris Preston:

"Steve Gregory has prepared the bulk of the text on behalf of the British Myriapod and Isopod Group. The accounts of the woodlice species give a vivid picture of them as living animals, with detailed accounts of their appearance, characteristic movements and rather precisely defined habitats, often illustrated by splendid photographs. It is not easy to distil the results of a wide-ranging national survey into a lively text, and Steve has doubtless succeeded so well because he brings to the task his own very extensive field experience.

Readers without specialist knowledge of the Isopoda will doubtless be struck by a range of similarities or contrasts with the groups they know themselves. Two points particularly interested me. It is clear from the text that students of woodlice are not prepared to accept the native/alien dichotomy as the sole criterion for the conservation of a species, with native species treated (if threatened) as worthy of conservation action and alien species disregarded. Several species, such as *Acaeroplastes melanurus*, *Eluma caelata* and the British population of *Oritoniscus flavus*, appear to be introductions and yet are valued members of our fauna. Another striking feature of the woodlice is the presence of numerous species with Atlantic ranges in Europe, such as *Ligia oceanica, Miktoniscus patiencei* and *Porcellionides cingendus*. This arguably makes the woodlice more important members of our fauna than superficially charismatic groups, such as the butterflies, which are too thermophilous to be well-represented in our oceanic islands.

This book shows how even a relatively small band of recorders can not only contribute to the knowledge of their own specialist group but also produce a text which illuminates for the rest of us wider aspects of the biogeography and conservation of British and Irish biodiversity."

C. D. Preston,
Biological Records Centre, June 2009



ATLAS OF EUROPEAN MILLIPEDES (CLASS DIPLOPODA).
Volume 1. Orders Polyxenida, Glomerida, Platydesmida, Siphonocryptida, Polyzoniida, Calipodida, Polydesmida

By R. D. Kime and H. Enghoff

Co-published by Pensoft Publishers, Sofia-Moscow and the European Invertebrate Survey, Leiden (2011): 282pp

This magnificent book is the culmination of a tremendous amount of work co-ordinated by Desmond Kime over many years. In fact it is just the first of three planned volumes; the other two will cover the two large Diplopod orders Julida and Chordeumatida. The idea of preparing a European atlas (as is explained in the introduction) was taken at the Fourth International Congress of Myriapodology in 1978 and later received the backing of the European Invertebrate Survey. Of course a project as large and complex as this requires collaboration and input from many people and the extensive acknowledgements reflect this. British readers of the Bulletin will be familiar with our own recording schemes and appreciate the added complexity of working across the whole of Europe and with a range of different languages.

The introduction to the book starts with a brief overview of millipede morphology, ecology and classification. It then discusses issues relating to the mapping and explains how to interpret the maps and accompanying text. The maps cover Europe from the Azores in the west to the Ural Mountains in the east. They cover all the Greek islands but not Cyprus and only the European part of Turkey. One of the most useful parts of the introduction is the coverage map showing all the 50km squares from where records have been obtained. As we might have expected the UK has almost complete coverage (is there a single square lacking records in northern Scotland?) but this map is notable for the gaps. Spain and southern Portugal are perhaps the most obvious but there is a 'white hole' in eastern Germany and rather sparse coverage in Poland. There are tantalising gaps in France and Italy (areas to plan your future holidays perhaps?). As might be expected the records become less frequent to the east and north into Scandinavia.

The second part of the book consists of the text relating to the species. Each is listed (with families in taxonomic order and then genera and species listed alphabetically) with synonyms given and then a list of the geopolitical units in Europe in which the species has been recorded (explained in a map and table in the introduction), a description of the habitats in which it has been found and then a 'remarks' section covering points relating to taxonomy or distribution. The text was clearly completed after the maps because a few later records were mentioned in this section if they changed the understanding of the distribution (for example *Trachysphaera lobata* from south Wales). The amount of text for each species is variable and can be very short for a species only known from its type locality or several paragraphs for a more widespread one.

Finally, the main part of the book is the maps themselves. There are two forms of maps, one covering the whole of Europe and one southern Europe and each species has been plotted on the most appropriate one. The Macaronesian islands are included in both in boxes. Species found at the 50km scale are marked on the maps with blue dots, with open blue dots illustrating a record with a less precise location. I did find that the blue colour meant that the presence of a single record was not always easy to see, especially if it coincided with a coast line. Records from different historical periods have not been distinguished and the rationale behind this is explained in the introduction.

Of the over 1500 species known from Europe 492 species are mapped in this volume which is more or less complete for the orders listed in the title. Species only known from hothouses have not been mapped although a list of them is given at the end of the species account section. *Oxidus gracilis* has

a species account but is not mapped because it was considered impossible to distinguish the outdoor records from the indoor ones.

For British myriapodologists the maps make very interesting browsing and help put some of our species in context. *Adenomeris gibbosa* is for example only found elsewhere in the Pyrenees and *Trachysphaera lobata* is a bit more widespread but with a similar pattern extending down through the southern part of France. *Polyzonium germanicum* has a disjunct distribution with those from south east England being part of a western population also including France which is almost completely separated from a more eastern population in Germany and down to the Balkans. Of our more widespread species both the tiny Polydesmids *Macrosternodesmus palicola* and *Ophiodesmus albonanus* have a very similar distributions but it is notable that the British Isles is a real stronghold, there are just some records in France, some in southern Scandinavia and a few more in the Benelux countries. The maps also show clearly the relatively well defined range of our common Polydesmid, *Polydesmus angustus* which appears not to get further south than the Pyrenees nor much further east than the middle of Germany. *Polydesmus coriaceus* in contrast has scattered records in France, more around the Pyrenees and then another cluster in the Benelux countries. Hours of fun thinking of possible causes for some of these patterns!

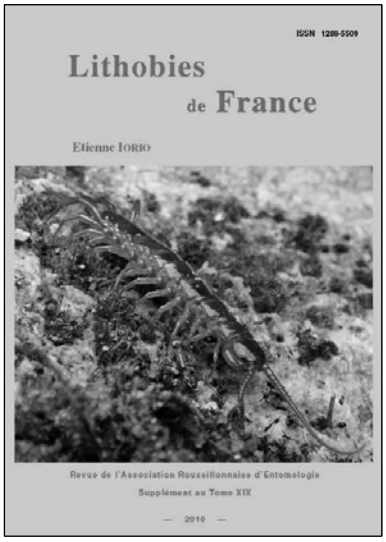
Aside from the British species the colour plates (some of them full pages) of some of the more spectacular European species such as the brown and yellow *Polydesmus collaris* or the Callipodid *Apfelbeckia insculpta* liven up the appearance of the book and illustrate some exciting prospects that we might find on holidays to other parts of Europe.

My one major criticism of the atlas is the lack of an index, making finding maps and text of specific species difficult. To some extent this has been addressed by a checklist where each species is numbered, but while the same numbers are used in the text for the species accounts the maps themselves are not numbered. I found this hampered my enjoyment of searching through for European species that I was less familiar with. This point aside the atlas is a fantastic reference book for anyone interested in millipede distribution and I can't wait for volumes 2 and 3.

The atlas can be purchased from the publishers, Pensoft. www.pensoft.net or orders@pensoft.net.

The review copy has been placed in the BMIG library at Dinton Pastures.

Helen Read



LITHOBIES DE FRANCE

By Etienne Iorio

Revue de l'Association Roussillonnaise d'Entomologie, Supplément au Tome XIX (2010)

From its publication in 1930 until the appearance of Ted Eason's *Centipedes of the British Isles* in 1964, the standard work on the group for British myriapodologists (alongside the various checklists of Brade-Birks and Blower) had been Henri Brölemann's *Faune de France* volume, *Chilopodes*. Even after *Centipedes*, Brölemann became a "back up" volume for anything puzzling either because it did not seem to be one of our species or there was something odd about it which "did not quite fit" and we would go through his keys to see where we got to – often to confirm what we thought it probably was anyway.

J-M.Demange's 1981 *Les Millepattes*, although very valuable for millipedes, with its illustrations of gonopods, was disappointing as regards centipedes, containing a slightly updated version of the Brölemann key for centipedes but without the species descriptions of its predecessor.

Other than some studies by Jean-Jacques Geoffroy, work on French centipedes had been limited in the latter part of the twentieth century. However, the early years of the present one a series of papers, some species descriptions or re-descriptions, others faunistic studies of particular regions have been published by Etienne Iorio. In due course, in 2007, we had an account of the Scolopendromorpha of France and in 2008 the centipedes of Provence-Alpes-Côte d'Azur with a key to their species of Lithobiidae. The current volume is a much more substantial contribution towards a complete account of the French chilopod fauna, comprising, as it does, more than a hundred pages.

Lithobiomorpha are not a particularly "easy" group and over the years there has been an amount of synonymy created as well as a some relatively poorly described or defined species. Much of the confusion was cleared up by Ted Eason in his latter years through re-examination of much type material but, especially to the beginner, they remain one of the more "difficult" groups.

In Britain we only have 17 (reliably) recorded species of *Lithobius* and two of *Lamyctes*. France has a much greater geographical area which ranges from the northern and north-western départments, climatically not so different from southern Britain and with a range of similar (but not identical) species to the Mediterranean, Pyrenees and Alps and also includes Corsica. In addition there are cave systems much less affected by the last glaciations compared with our own. The range of forms in the country is, in consequence, much greater than in our own and includes 57 species of *Lithobius*, 6 of *Eupolybothrus*, one *Harpolithobius* and two *Lamyctes*.

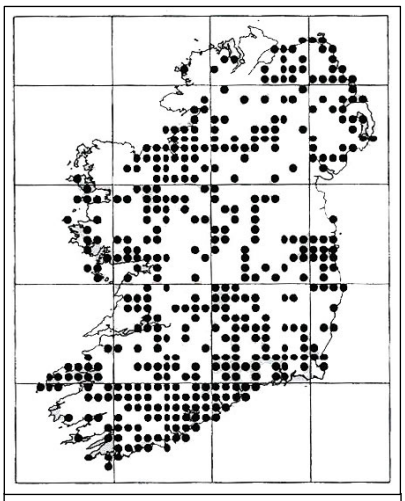
The present account has an introductory section which includes aspects of the morphology of lithobiomorphs, features of taxonomic value (including spinulation) and ecology and preservation. There is then a redescription of 4 poorly described species (two of which are from Corsica), a description of the female of *Lithobius raffaldii* and a description of a new species (*Lithobius cherpinedensis*), both of which are from Corsica and cavernicolous, followed by additional notes on the morphology of a dozen species (including *Lithobius lapidicola*) and a complete list of French species. This latter includes all our British lithobiomorphs including our doubtful *Lithobius agilis* and *Lithobius erythrocephalus*. For *Lithobius peregrinus* the note is "*Une seule citation dans la grotte de Pont-Saint-Esprit (Gard), incertaine d'après Zapparoli (1992)*" whilst for *Lithobius variegatus*, "*Basse-Normandie, Bretagne et Pays-de-la-Loire. Hypothétiquement present dans d'autres régions du Littoral atlantique*."

The key, which includes some species recorded from the frontier regions of Italy and Spain and therefore "possibles", commences with the usual separation of Henicopidae and Lithobiidae followed by that of *Eupolybothrus* (coxal pores numerous and in many irregular rows), *Harpolithobius* (first pair of legs very much thickened and without spines) and *Lithobius*. In the key to the latter, the first couplet starts with presence or absence of the spine VmH (= VmC) on the fifteenth leg which, I have to admit, seemed a bit daunting at first given the need to get one's head around spinulation. However (a) it does clearly split off *Lithobius pilicornis* (b) 15VmC is quite an obvious spine and much easier to distinguish than 15VaC (VaH in French) which is not always easy to spot - or rather easy to imagine one has spotted and is confused by 15DaC. (c) unlike accessory claws, secondary sexual characteristics, etc. of the 15th leg this coxal spine is still usually present when the rest of the leg has been accdentally lost. From there we are looking for "*courts tronçons de sillons paramédians*." (clearly illustrated), coxosternal characters, projections on tergites, ocelli, antennal articles, spinulation, claw of 15th leg, etc. Having tried the key out in draft form for a few British species it did seem to work well.

There are numerous illustrations of key characters and in addition tabular keys with size, ocelli, coxosternal teeth, VaH (VaC), spinulation of 15th leg, particular aspects of spinulation, claw of 15th leg, dorsal chaetotaxy of female gonopods, female gonopods spurs & claws, features common to both sexes (e.g. very large organ of Tömösvary noted in certain species). These serve the purpose of assisting identification of damaged specimens as well as confirmation of identification from the dichotomous key. The final part of the book lists additional locations for species and an extensive list of references. Finally a summary in French and English.

The author is to be congratulated on an excellent production including a variety of colour illustrations and it is a valuable addition to the keys for European species. British workers will find it of much interest and one may well predict that the next lithobiid "new to the British Isles" is likely to be one that is included here. To get so much in within the size of the publication, obviously overall species descriptions (except as already indicated) are limited but there are plenty of references and, indeed, as the present volume indicates, Brölemann, with its detailed descriptions remains available freely on line at: http://www.faunedefrance.org/bibliotheque/docs/H.W.BROLEMANN(FdeFr25)Myriapodes-Chilopodes.pdf.

Tony Barber



Lithobius variegatus

A REVIEW OF THE IRISH CENTIPEDES (CHILOPODA)

By Martin Cawley

***Bulletin of the Irish Biogeographical Society* 34:18-64 (2010)**

Many years ago I wrote a review of our knowledge of Irish centipedes which, as I realised at the time, was more about how little we knew rather than how much and many of the records I had were fifty or more years old with only 19 species recorded in total (Barber, 1984). In the 1988 *Provisional Atlas* (Barber & Keay, 1988) less than 650 centipede records could be plotted for Ireland, many of these very old. The present paper shows how much further we have progressed since then and the author and all those who have increased our knowledge of Irish species are to be congratulated.

In the early years of the twentieth century there had been a good number of papers dealing with Irish myriapods such as those in the reports of the Belfast Naturalists Field Club, several papers by H.K. & S.G. Brade-Birks and papers by G.H.Carpenter, N.H.Foster, W.F.Johnson (including the section in the Clare Island Survey), C.M.Selbie and others. The latest of these dates from 1919 and it seems that after this little if any work was reported on Irish Myriapoda. Selbie had perished at the Somme and Carpenter left Ireland in 1923. In addition to published reports, there are also some collections and hand-written lists in the National Museum of Ireland (Dublin); photocopies of the latter were kindly made available to me by Jim O'Connor.

By the 1970s with the initiation of various invertebrate recording schemes and the availability of keys for both millipedes and centipedes there was a revival of interest in Irish myriapods with which the names of Carmel Mothersill and Declan Doogue are linked. The latter, in collaboration with the late Colin Fairhurst went on to study the millipedes in some detail but the centipedes, for whatever reason, remained more neglected. However a number of collections and records were made over the years by visiting British workers such as Keith Alexander, Paul Harding, Dick Jones and Adrian Rundle and we also had had contact with D.S.Higgins (Trinity College) and Don Cotton (Sligo) amongst others.

In the last decade of the twentieth century, things were to change. Two names stand out, Martin Cawley (Sligo) and Roy Anderson (Belfast), both interested in a variety of natural history topics but both of whom were making collections and lists of Irish centipedes from various different parts of the island. By 2001, Martin was able to report just over 1600 10km centipede records and the present work refers to nearly 3000 10km square records. In 2002 BMIG had held a field meeting in the Dingle area. There has also been the development of the National Biodiversity Data Centre at Waterford with its encouragement of recording and its production of on-line maps. All Irish records which we now have, including those of Martin and Roy, have been passed to (British) Biological Records Centre, Wallingford and are being shared with NBDC.

We now have a much better knowledge of Irish centipedes than we have ever had before and the this account includes 11 species added to the 1984 list. It includes comments on both distribution and likely status, vice-county records, 10km distribution maps and an extensive bibliography. The fact that Martin was able to examine NMI specimens has shown that in some cases animals were collected but not correctly identified many years ago such as a specimen of *Geophilus osquidatum* from North Kerry collected in 1893, long before it was added to the Irish list in 1986 or, indeed, to the British list (1952). It was not actually described as a new species by Brolemann until 1909. It has also allowed him to allocate NMI "*Geophilus carpophagus*" material to *Geophilus easoni*.

Additions to the 1984 list include *Schendyla dentata* (MC), *S.peyerimhoffi* (MC), *Henia brevis* (R.Jones), *H.vesuviana* (Roy Anderson & MC independently), *Geophilus easoni* (Steve Gregory),

G.osquidatum (Adrian Rundle), *G.pusillifrater* (MC), *Cryptops anomalans* (MC), *C.parisi* (Adrian Rundle), *Lithobius macilentus* (MC), *L.pilicornis* (MC). Martin is uncertain about *Strigamia acuminata* (det. Dick Jones but specimen unavailable) and *Lithobius muticus* (det. Andy Keay but specimen mislaid) since he has not the specimens to hand and has failed to rediscover them at the appropriate sites or elsewhere. He also removes *Lithobius agilis* from the Irish list; this has been extremely doubtful for a long time and there are no voucher specimens in NMI (nor has it been reliably recorded in Great Britain in recent years).

What we have listed is 30 Irish species compared with a British total of about 47. Perhaps the most obvious missing species is *Lithobius calcaratus*, a widespread species said to favour dry sites in Britain. Also absent are possible or probable introductions such as *Stigmatogaster souletina*, *Eurygeophilus pinguis*, *Nothogeophilus turki*, *Arenophilus peregrinus*, *Stenotaenia linearis*, *Lithobius peregrinus* and *L.lucifugus* and several greenhouse/hothouse species.

What is interesting is the comparison of distribution of species in Ireland with that in Great Britain. *Stigmatogaster subterranea*, apparently rare or absent in much of Scotland occurs all over Ireland, *Strigamia crassipes* has been recorded in most parts of Ireland whilst in Britain most records are more or less southerly with a handful of reports from Central Scotland but *S.acuminata*, mapped as present in Britain up to Cumbria and Yorkshire, is apparently rare (if present) in Ireland. *Geophilus flavus*, *Lithobius microps*, *G.insculptus*, *G.truncorum*, *L.borealis, L.forficatus*, *L.melanops* and *Lamyctes emarginatus* seem to be widespread in both Britain & Ireland although the first two of these are seemingly absent in northern Scotland, the Western Isles, Orkney and Shetland. *Lithobius variegatus* seems to occur all over Ireland whilst, as we are aware, it is largely or completely absent in eastern England and much of Scotland. *Lithobius pilicornis* is widespread in SW England and occurs in SW Wales and is elsewhere recorded from various scattered synanthropic habitats as far north as Yorkshire but in Ireland there is a single synanthropic record from Cork City.

Amongst the remaining British species not on the Irish list, the globally widespread and distinctive *Pachymerium ferrugineum* is either on the very edge of its range or just beyond it in Britain with just four records from shingle on the south & east coasts of England and *Lithobius lapidicola* is only known out-doors from the Kent and Suffolk coasts. *Lithobius curtipes* has scattered records across Britain but, like its relative *L.crassipes*, seems to be absent from SW England and it is notable that *L.crassipes* has a distinct northern rather than southern distribution in Ireland.

Lithobius tricuspis is interesting. Its main occurrence in Britain is in an area of South Devon where it occurs in a diversity of rural habitats and has also been found in woodland in South Wales. It gives the impression of being a relict species in Britain and is very common in France. It could be a possible candidate for Irish occurrence and it was even suggested at one time that the Irish "*L.agilis*" might be this (to which it is rather similar) but obviously other non-British but European species might equally well be present in Ireland also.

Should the house centipede *Scutigera coleoptrata* be expected in Ireland? In Britain and Northern Europe generally it occurs occasionally inside buildings as an introduction from warmer climates. However it can be found out of doors in Jersey and Guernsey as well as being common indoors there. I have heard tell of an Irish (indoor) occurrence which I cannot substantiate but perhaps it will turn up and give someone a surprise as it runs up the living room wall as they sit watching television one evening.

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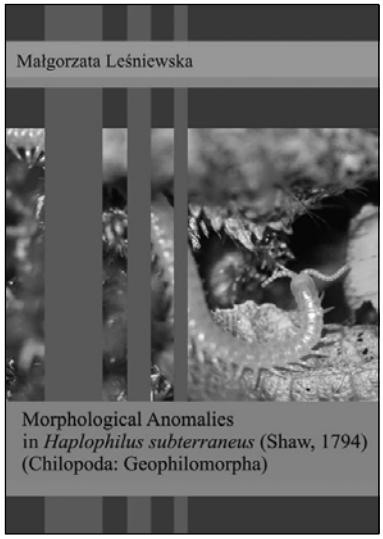

MORPHOLOGICAL ANOMALIES IN *HAPLOPHILUS SUBTERRANEUS* (SHAW, 1794) (CHILOPODA: GEOPHILOMORPHA).

By Małgorzata Leśniewska

Poznań: Wydawnictwo Kontekst (2012): 207 pp

(ISBN 978-83-62564-18-7)

Many of us who have looked at geophilomorphs in any detail may have noticed odd abnormalities in terms of asymmetrical leg development, sternite structure, etc. and may have even noted these in the Bulletin or elsewhere and, of course, we remember Chris Kettle's famous discovery of a *Strigamia maritima* with an even number of legs. However we have all probably usually regarded such features as relatively uncommon. What the present study shows is that, for *Haplophilus subterraneus* (= *Stigmatogaster subterranea*) at least, abnormalities are surprisingly common if one looks closely, averaging out at more than 30% of individuals and occurring in both adults (males & females) and juveniles and with single specimens having anything up to 8 anomalies. In the small British sample (Devon & Cornwall) included, 12 out of 35 individuals showed anomalies with a maximum of four in one individual (antennae, leg, sclerite deformation, ventral pore field).

The author, having found a (synanthropic) population in Poznan, the first record of the species from Poland, noted large numbers of abnormalities. Subsequently finding that such a level of abnormality is not confined to this population, she has looked at specimens across a wide area of Europe, Belgium, Denmark, France, Germany, the Netherlands, Poland and UK, a total of 2858 individuals from 31 populations. In one location in the Pyrenées near Jarret the population was accompanied by specimens of *Haplophilus souletinus* (*Stigmatogaster souletina*), familiar to those who attended the Cornish BMIG meeting in 2009 and which, in the field, it closely resembles. These also showed various anomalies in 15 out of 37 specimens.

Haplophilus subterraneus appears to occur in all countries of Central & Western Europe, reaching as far as the Pyrenees in the south (it has also been introduced to Newfoundland and New York). It shows distinct synanthropic habits in most of the countries from which is been recorded (Norway, Sweden, Denmark, Germany, Switzerland, Poland, UK, Netherlands. In France it occurs in both natural and synanthropic sites (in SW England it can be found in woodland but how much of this could be described as "natural"?)

Anomalies considered were differences from the standard descriptions of the species. Obviously these were non-lethal "defects" and possibly the result of regeneration. The categories were 1. Trunk anomalies; dorsal mispairing, trunk shrinking, even number of leg-bearing segments, trunk bifurcation, sclerite deformation, defects of spiracles, defects of ventral pore fields, defects of virguliform fossae, 2. Anomalies of legs; oligomely (missing leg), anomaly in size of whole leg, reduced/increased number of leg articles, article deformations, anarthrogenesis (incomplete division between articles), defects of coxal pore areas, shistomely (bifurcation/trifurcation), somatomely (additional, isolated appendage), heterosymely (fusion of legs on same side), bifurcation of apical claw, 3 Antennal anomalies; article deformations, reduced number of articles, bifurcation, anarthrogenesis. Illustrations of these are included. Even numbers of leg-bearing segments (LBS) were found exclusively in Polish specimens, five with 80 leg-bearing segments and one, a male, with 78.

In her conclusion, the author rules out external, artificial environmental factors that could have teratogenic effects and suggests that it is fanciful to say that some single environmental factor operates with a similarly high intensity in such different environments as, for example, in a city centre park in Poznań, a beech forest near Lübeck, a cemetery in Koblenz and a forest in the Pyrenees (at 900m asl). "Anomalies occur randomly. The extraordinary number of anomalies is clearly a characteristic of the species or even of the higher taxon; perhaps the family. The cause of their occurrence should possibly be sought at the level of the developmental system".

She also considers the case for regeneration, normally ruled out for the Geophilomorpha. There is, in fact, thus far, no documented evidence for lack of regeneration in these animals and possibly, the evidence she has assembled (including reference also to the occurrence of scars) might offer an indication of indirect evidence for it occurring e.g. in legs and antennae.

As an interesting side effect of examining all the data is the observation regarding the relation between LBS and latitude. In Britain, Wallace Arthur and Chris Kettle in their 2001 paper showed a latitudinal cline in females of this species with higher values for LBS in more southerly locations. In the present case, based on more than two and a half thousand specimens between 42ºN and 55ºN such a N-S cline does not occur but, on the contrary, lower values for LBS are found in more southerly locations with the lowest in the most southerly, the Pyrenees

To quote Sergei Golovatch "*This is a very nice piece of work devoted to a summary and analyses of the morphological anomalies in a geophilomorph centipede. It is very thorough, meticulously performed and most detailed study of the subject, incorporating lots of material, mostly original, amassed from all over the distribution area of the species, also being accompanied by numerous clear line drawings, graphs and tables ……..*"

Tony Barber

MISCELLANEA

UNTITLED CARTOON BY MARIANNE MISIOCH

The delightful cartoon on the front cover appears to depict a centipede contemplating the delights, or otherwise, of the world above ground. The cartoon was found, framed, among a small collection of Gordon Blower's mainly personal effects that came to light in late 2010. Also in the frame was the following note:

> *Hamburg 14/1/1976 Dear Professor Blower, Thank you very much for your quick and kind help. I'm especially happy because of your excellent letter of recommendation which is for me an additional stimulus to continue my work. With my best regards, Marianne Misioch.*

Marianne Misioch did continue her work, probably with Professor Kraus, and published papers on central European Geophilomorpha in the proceedings 3rd and 4th International Congresses of Myriapodology. She went on to teach biology and chemistry at Gymnasium Oldenfelde in Hamburg from 1982 to 2007.

In that Misioch's cartoon was framed and probably sat on Gordon Blower's desk for many years suggests that he greatly appreciated her gratitude and slightly cryptic humour. Her cartoon and note are now incorporated into "The Blower Unpublished Archive" at Manchester Museum, although they arrived too late to be considered in the paper by Proudlove & Logunov in 2011 (*Bulletin of the British Myriapod and Isopod Grou*p, 25, 14-36).

Paul T. Harding

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Cover illustration: 1st & 2nd pleopods of male *Metatrichoniscoides leydigii* © Steve Gregory

Cover image: Untitled cartoon © Marianne Misioch (see Miscellanea)

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