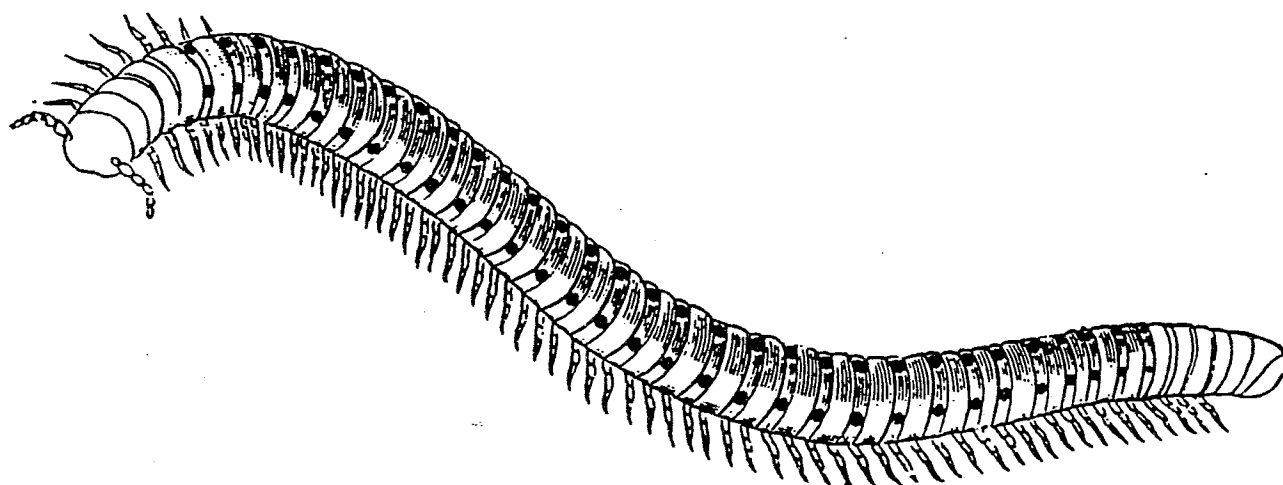

BULLETIN **of the** **BRITISH** **MYRIAPOD** **GROUP**

Edited for the Group by
A.D. Barber
and
H. Read



Volume 12

April 1996

BULLETIN OF THE BRITISH MYRIAPOD GROUP

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EDITORIAL

This edition of the bulletin is exceptional in that it includes articles concerning no less than five millipede species new to the British Isles including one known from nowhere else. Most, if not all, have probably arisen by importation but the known distribution of *Melogona voigti* is not so far from Britain that it could not be seen as a natural spread for this species.

This Bulletin is not only about millipedes though. The centipedes are represented in a very useful key to lithobiomorphs which includes several more species than were covered by Eason in 1964. Also featured is the second part of the distribution maps for Oxfordshire.

It is particularly encouraging to see some new names amongst the contributors and we look forward to receiving more articles from them. The future of the Bulletin relies of course upon its authors so we would like to encourage all budding authors to put pen to paper.

This year is also notable for the publication of two myriapodological books both based on distribution maps. These locally based reports are a welcome tasters to help us anticipate the British distribution maps which (for the millipedes) are making good progress towards an atlas.

We are also looking forward in the coming year to the International Congress which is to be held in Copenhagen. The congresses are always enjoyable occasions and we hope to see a strong British contingent as well as renewing acquaintances with some of our international colleagues.

F. A. TURK, 1911-1996.

Frank Turk of Reskadinnick, Cornwall (whose bardic name was *Ancar Skyansek*, Hermit Scholar) died after a short illness on 14th February 1996.

In accordance with his expressed wishes no formal obituary will be published. We extend our sympathy to his widow, Stella.

Tony Barber.

**ANAMASTIGONA PULCHELLUM SILVESTRI (CHORDEUMATIDA:
ANTHROLEUCOSOMATIDAE) AN ADDITION TO THE FAUNA OF
NORTHERN EUROPE, RECORDED FROM IRELAND.**

Roy Anderson

Department of Agricultural and Environmental Science, The Queen's University of
Belfast.

INTRODUCTION

On 24 September 1994 I collected a number of immature stadia of an unknown millipede from woodland at Delamont House (J512 507) Co. Down. These resembled immatures of *Craspedosoma rawlinsii* Leach, a locally common species of wet woodland in Northern Ireland, and were initially labelled as such.

Subsequently, mature specimens of the same taxon were collected at several sites in east and north Down and it became apparent that a non-British species was involved. Demange (1981) and Brölemann (1935) were consulted but gave no indication of the identity of the animal. Descriptions and drawings of the key features including the genitalia were then sent to Dr. J.-P. Mauriès of the Museum National d'Histoire Naturelle in Paris. In his reply Dr Mauriès indicated that the description was very close to that of *Anamastigona pulchellum* Silvestri, a southern Italian species reported from sites of introduction in southern France (Mauries 1960) and Madeira (Demange 1970). The occurrence of a southern European species so far to the north as Ireland seemed unlikely both to him and to the author but a detailed comparison of published material was undertaken to assess points of similarity. The conclusion drawn from this was that Mauriès' initial diagnosis was correct and the Co. Down species was *Anamastigona pulchellum*.

As the literature relating to this species is relatively inaccessible a synopsis of the morphology and habits of *Anamastigona pulchellum*, based largely on material collected in Co. Down, is provided below.

SYNONYMY:

Anamastigona pulchellum Silvestri 1894
Prodicus attemsi Verhoeff 1900
Prodicus neapolitanus pulchellus Verhoeff 1905

TAXONOMY:

Order Chordeumatida
Family Anthroleucosomatidae Verhoeff 1899
Subfamily Anthroleucosominae Verhoeff 1899

GENERAL DESCRIPTION.

A medium sized chordeumatidan resembling *Craspedosoma rawlinsii* in general facies but smaller (10mm, *Anamastigona pulchellum*, vs 15mm, *Craspedosoma rawlinsii*, in length), with the metazonites bearing long setae and with the body a mottled, matt, red-brown colour.

SIZE.

Male, 9-10mm; female 9.5-10.5mm. Width up to 1mm.

HEAD.

Vertex of the head is convex and very pilose in the female but more flattened and smooth in the male. The antennae are long and reach the hind margin of segment 4. There are 17 pigmented ocelli arranged in an acute triangular field.

BODY.

Metazonites are cylindrical with small mid-lateral keels (paranota) around the insertion of the middle macrosetae. The macrosetae are arranged as in figure 1.

MALE SEXUAL CHARACTERS.

(a) Legs. Legs in both sexes are long but leg 6 and particularly leg 7 in the male are longer and stouter than the remainder of the walking legs.

(b) Coxae. The hind half of the coxa in leg 10 has a strong digital internal extension. In the front half the coxal sac projects into two internal swellings, one anterior, the other posterior (figure 2).

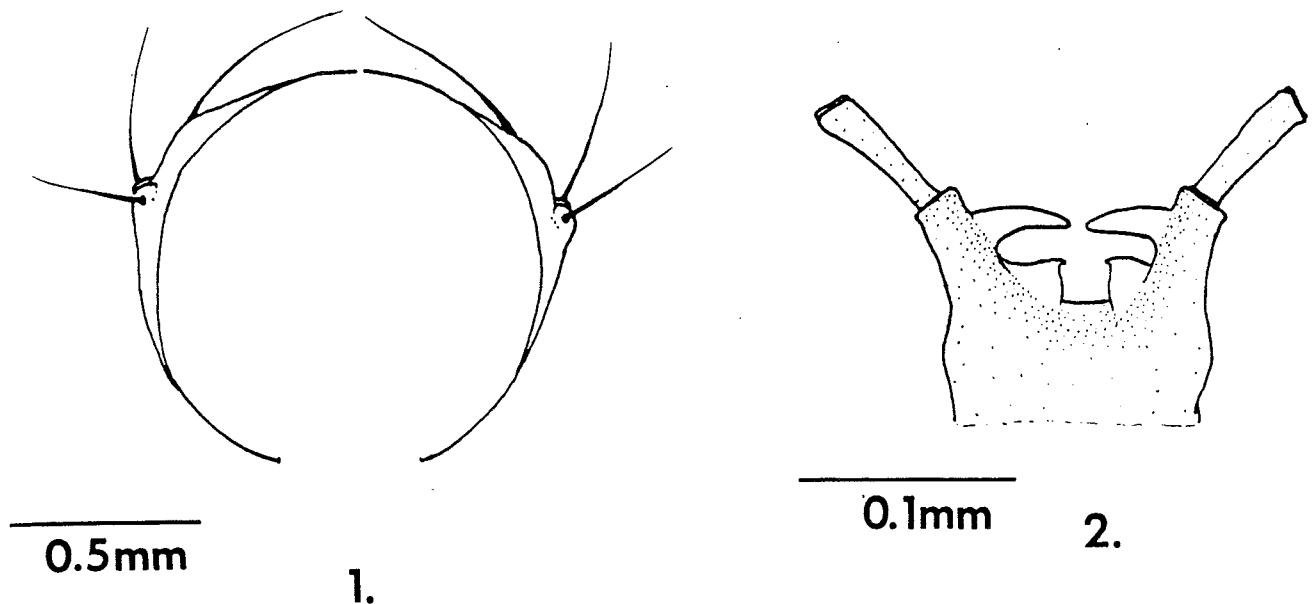


Figure 1. Caudal view of a middle segment of *Anamastigona pulchellum*, showing the arrangement of setae.

Figure 2. Structure of the coxae of segment 10 (male).

(c) Paragonopods (Figures 3 and 4). Segments 8 and 9 are noticeably expanded around the genitalia. The paragonopods are relatively large and project out of the body cavity in segment 8. The projecting telopodites are wing shaped from side view with laterally flattened tips attenuating to points which are directed backwards (Figure 3A). The median syncoxite (3B), lying between these, has a complex structure. Salient features are an elevated spiny field between the telopodites which is grooved on the upper surface and continued backwards into a projecting keel (3C). The keel is strongly spinulose, particularly when seen in side view.

(d) Posterior gonopods, segment 9. These have smaller but well separated telopodites, and a truncate median field (figures 3, 5).

SEX RATIO:

Male to female ratio 1:4 at the Co. Down sites.

Female characters were not examined.

DISCUSSION

The Anthroleucosomatidae are widely distributed in the Palearctic but have not heretofore been represented in the fauna of Europe north and west of the Alps (Mauriès 1960). It is evident from the Madeira and Toulouse records that *Anamastigona pulchellum* has good dispersal ability and can successfully colonise new terrain. Even so, the very wide difference in latitude between its former range and north east Ireland make the apparent ready adaption to conditions there seem extraordinary.

The four Irish sites so far are all in Co. Down:

Delamont House (J513 507), 24 September 1994. Large number of sub-adults on the undersides of dead beech branches; leaf litter under beech and laurel in old estate woodland.

Clement Wilson Park, Belfast (J326 695), 24 October 1994. Occasional adults in litter under Norway maple and white poplar; disturbed, wet, riverine wood.

Edenderry, Belfast (J324 685), 26 October 1994. Abundant in litter under native alder in riverbank carr.

Rowallane (J405 575), 10 December 1994. Occasional in deep leaf litter under beech/oak on acid humus soils; old estate woodland.

On two years' observations (1994-1995) it appears well naturalised in these localities. A small range of immature stadia have been found in late summer/ early autumn with sexually mature stadia appearing from early October to at least February. There is also an outlying record or an early instar on 22 February 1996 at the Clement Wilson Park site. The overlap of generations which the latter record denotes is suggestive of a longer than annual cycle.

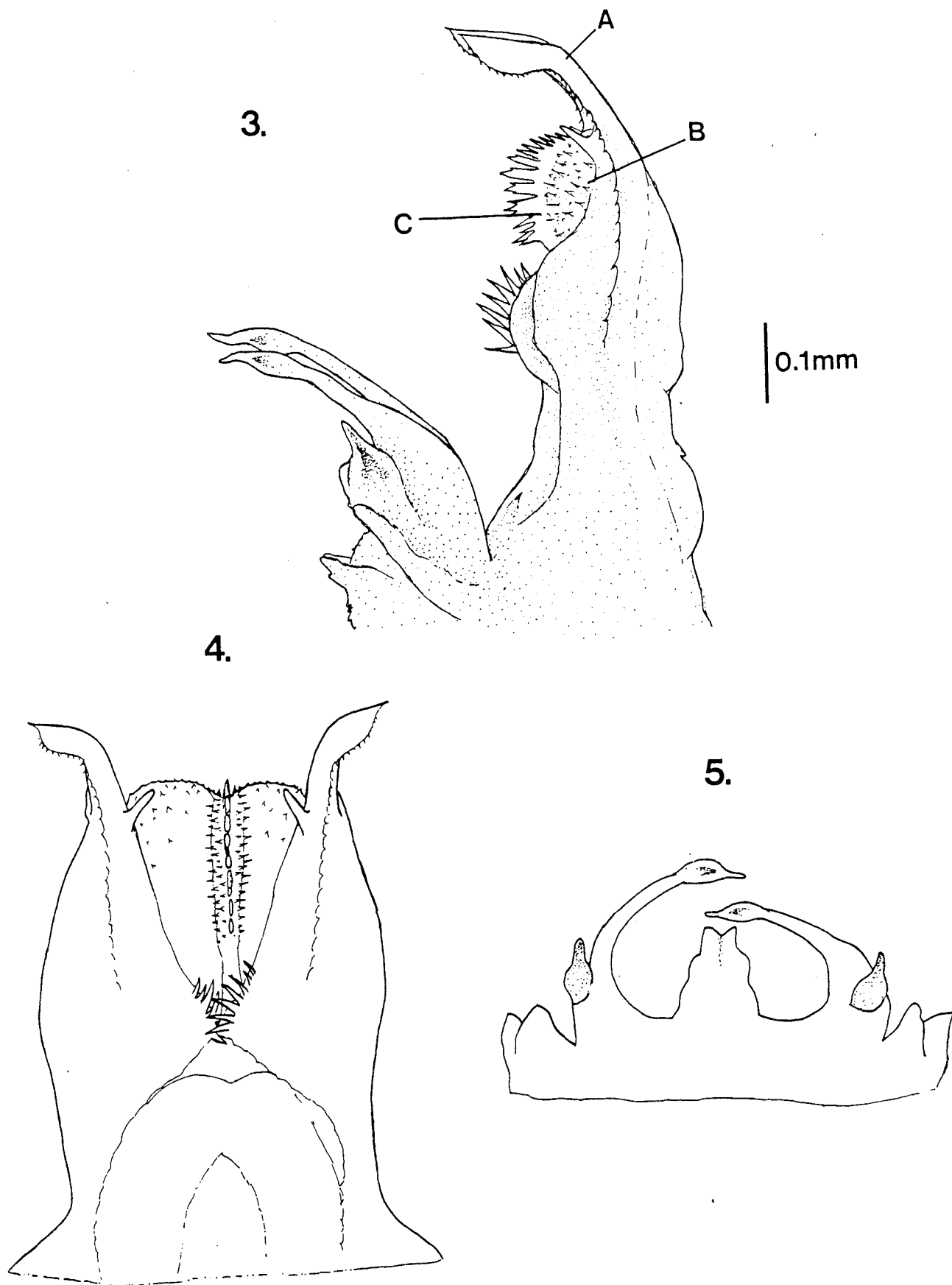


Figure 3. Side view of the gonopods and paragonopods. A - paragonopod telopodites; B - syncoxite; C - spinules on the syncoxite keel.
 Figure 4. Caudal view of the paragonopods.
 Figure 5. Caudal view of the gonopods.

This species may be expected to spread to other parts of Ireland and western Britain in time. Habitat preferences are for deep, stable litter in deciduous woods, although wetter woods such as riverine alder with shallow, friable litter are also favoured. Collections were made by roughly raking back leaf and other litter and examining the ground surface underneath on to which most animals will fall. *A. pulchellum* appears as a medium to small, reddish-brown millipede which curls up into a nearly circular outline. Upon uncurling, movement is rapid because of the long legs and it can outpace most native millipedes.

ACKNOWLEDGEMENTS

I wish to thank Mr. R.E. Jones of the Millipede Recording Scheme for his advice and encouragement with this investigation. Particular thanks are due to Dr. J.-P. Mauriès of the Museum National d'Histoire Naturelle for the provision of much background information on *Anamastigona pulchellum*, and for his advice.

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HAPLOPODOILUS SPATHIFER (BRÖLEMANN, 1897) IN SOUTHEAST ENGLAND: A MILLIPEDE NEW TO THE BRITISH ISLES.

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INTRODUCTION

In 1976 an unfamiliar iulid millipede was found in Kew Gardens, London (outdoors) by Dr A. J. Rundle and was eventually identified as *Haplopodoiulus spathifer* (Brölemann 1897) by Dr H. Enghoff in 1986. *H. spathifer* had not hitherto been recorded in the British Isles but is known from the central and west Pyrenees where it is endemic. Then in March 1987 it was found again by AJR at Bedgebury in Kent. In June 1988 GBC found an adult male at Kew Gardens, also confirmed as *H. spathifer* by Mr. J. G. Blower, and again in June 1990 found an adult male at Wakehurst Place, Sussex, an outstation of Kew Gardens. On another brief visit to Wakehurst Place in March 1995 GBC found seven specimens under stones and dead wood in the wooded garden, these being the only millipedes found on that occasion.

Details of these records are as follows:

London: Kew Gardens, TQ 18-77- (VC 17)

30 March 1976 1o, 1o, under pieces of limestone resting on asphalt by the side of the footpath at the Ruined Arch, Kew Gardens TQ 186763, A. J. Rundle.

19 June 1988. 1o amongst long grass near the perimeter wall at TQ 189772, G.B. Corbet.

Kent: Bedgebury, TQ 722336 (VC 16)

28 March 1987 several, in fairly deep leaf litter beneath a specimen of Japanese Yew (*Taxus cuspidata*) at the National Pinetum, Bedgebury TQ 722336, A. J. Rundle.

East Sussex: Wakehurst Place, TQ 337311 (VC 14)

30 June 1990. 1 o under dead wood, G.B. Corbet.

24 March 1995. 3 o, 3 o, 1 immature under stones and dead wood in woodland garden, G.B. Corbet.

RECOGNITION OF *H. SPATHIFER*

Externally *H. spathifer* closely resembles *Allajulus* (= *Cylindroiulus*) *nitidus* in many respects but is considerably larger and darker. In the key in Blower (1985: 126) it would key out as *A. nitidus* which it resembles in the following respects: telson with slender pointed tail straight or nearly so, neither sharply upturned nor with a ventral concavity (Fig 1), ozopores on the suture between the pro- and metazonites; anal valves and upper surface of telson with numerous long setae; metazonites with very

short, fine, inconspicuous setae; adult males with first legs short and hooked. Externally *H. spathifer* and *A. nitidus* can be distinguished as follows:

- Size larger: adult females c. 23-30 x 1.9-2.4mm., adult males c. 20-28 x 1.5-1.9mm. (Demange gives up to 40mm. for continental specimens,); well pigmented both dorsally and ventrally, but with extensive lighter mottling; longitudinal striae widely spaced (as in *Cylindroiulus latestriatus* and *C. britannicus*), c.9 striae per 0.5mm; first legs of adult males with distal parts parallel (in ventral view), sharply angled in profile (Fig 2).

H. spathifer

- Size smaller: adult females c. 13-25 x 1.1-1.8mm, adult males c. 11-22 x 0.9-1.4mm; lightly pigmented all over or with sharp contrast between dark dorsum and pale venter; longitudinal striae closely spaced (similar to *C. punctatus*), c.12 striae per 0.5mm; first legs of adult males with distal parts strongly convergent (in ventral view), smoothly curved in profile.

A. nitidus

The shape of the telson cannot be used to separate the species reliably. Males of *H. spathifer* tend to have the hyaline tip very slightly upturned; the "tail" of *A. nitidus* is not always noticeably downturned but tends to have a characteristic teat-like appearance with a slight constriction proximal to the hyaline tip. The gonopods are shown (Fig. 3).

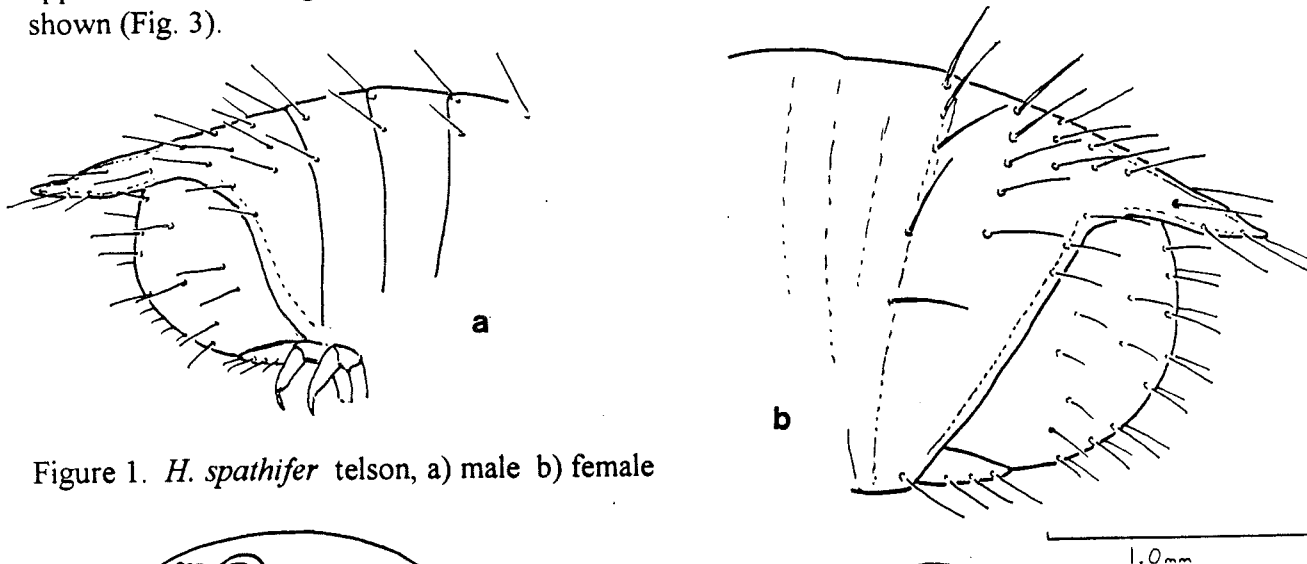


Figure 1. *H. spathifer* telson, a) male b) female

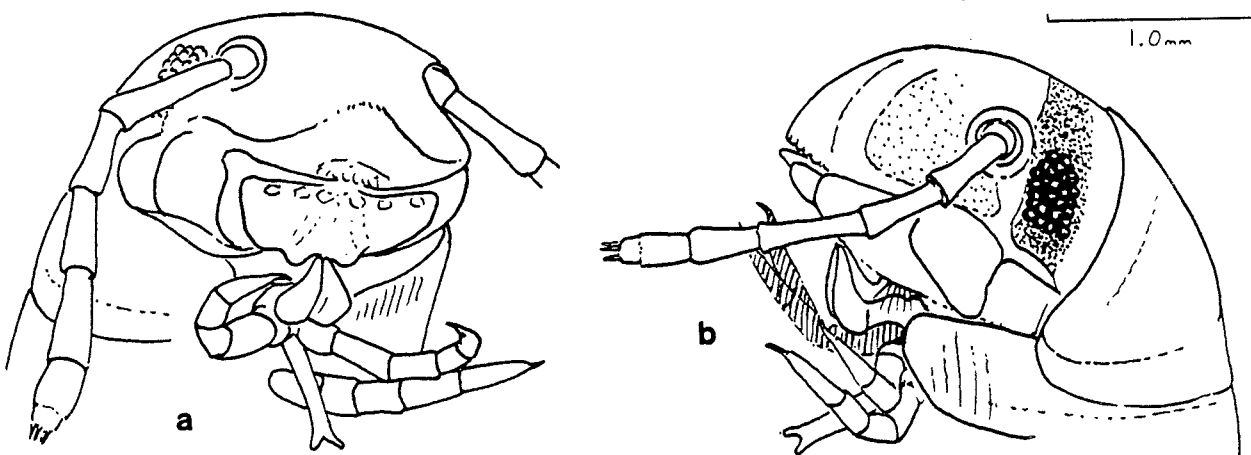


Figure 2. *H. spathifer* head of male showing a) first pair of legs from below plus penis b) the same from the side.

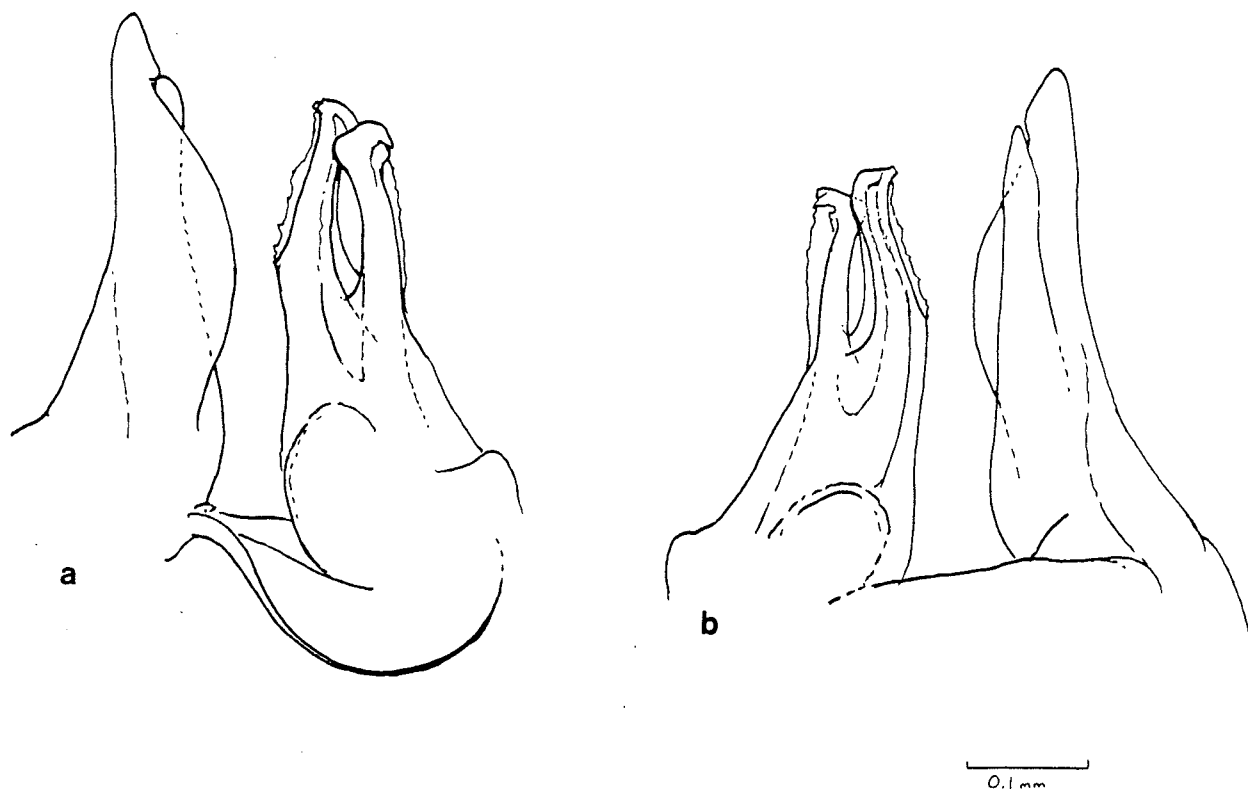


Figure 3. *H. spathifer* a) Internal profile of left gonopod. b) External profile of left gonopod.

CONCLUSIONS

H. spathifer appears to be well established at three sites in southern England, all of which have a connection through the main site at Kew Gardens, its probable point of introduction. It is the commonest outdoor millipede at Kew Gardens and does not occur in any of the hothouses. It prefers fairly deep, deciduous, leaf litter which retains moisture in the summer. Despite its abundance in the gardens it is yet to be collected outside despite a lot of searching. (Rundle, pers. comm.). It is well able to overwinter in England. It will probably spread further via the horticultural trade and it should be looked for in parks, ornamental gardens and garden centres.

Specimens from Wakehurst Place have been deposited at the Natural History Museum, London and at the Royal Museum of Scotland, Edinburgh. (NMSZ 1996.007).

ACKNOWLEDGEMENTS

We would like to thank both Gordon Blower and Adrian Rundle for thinking back a long way and putting together the sequence of discovery from their notes.

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MELOGONA VOIGTI (VERHOEFF) FROM THE LOTHIAN: A MILLIPEDE NEW TO THE BRITISH ISLES.

G.B. Corbet

Little Dumbarnie, Upper Largo, Leven, Fife, KY8 6JQ.

INTRODUCTION

The published map for *Melogona gallica* (Latzel) in the British Isles shows a strongly southwestern distribution, concentrated in Wales and Devon, with only one Scottish locality (British Myriapod Group, 1988). However the Scottish record, from Stirling Castle (NS 79), has subsequently been found to be an error for *Melogona scutellare* (P. Harding, in litt.). It was therefore a little surprising to obtain subsequent records at several sites in Fife and the Lothians, in the driest part of Scotland. These were mostly females, but close scrutiny of a male collected by Bob Saville at Dunbar, East Lothian on 28 April 1995 showed that it was not *Melogona gallica* but *M. voigti* (Verhoeff), not hitherto recorded in the British Isles. On the continent *M. voigti* occurs from southern Sweden through Denmark, northern Netherlands and Germany south to the northern Alps, east of the Rhine; it is replaced by *M. gallica* west of the Rhine and in west Belgium and France (Kime, 1990).

Search at other known sites for '*M. gallica*' in eastern Scotland has so far found male *M. voigti* at Thornton Glen, East Lothian, but confirmed *M. gallica* at one of the three sites in Fife. Re-examination of specimens collected by C. Rawcliffe in Edinburgh in 1988 revealed a further male *M. voigti*. Details of these records are given below.

SCOTTISH RECORDS OF MELOGONA VOIGTI

East Lothian: Dunbar. NT 6878 (VC 82).

28 April 1995, 1 adult male. Deciduous woodland and scrub with sparse herb layer, and much rubble, including concrete, close to buildings. Other scarce species at this site were *Brachychaeteuma bagnalli* and *Ophiodesmus albonanus*.

East Lothian: Thornton Glen. NT 7373 (VC82).

19 May 1995, 1 adult male; (12 April 1994, 2 adult females, possibly this species). This is a steep-sided 'dean' of mixed broad-leaved woodland surrounded by arable land, but like most such sites has suffered from the tipping of rubbish.

Edinburgh: Dean Gardens. NT 2474 (VC 83).

9 January 1988, 1 adult male collected by C. Rawcliffe (plus 1 female, probably the same species). These are private gardens on the banks of the Water of Leith, within the city.

SCOTTISH RECORD OF *MELOGONA GALLICA* s.s.

Fife: Glenrothes, Riverside Park. NO 2601 (VC 85).

16 May 1995, 2 adult males under stone in mixed deciduous woodland (with 1 female and 2 immatures); (7 January 1994, 1 adult female; 19 March 1994, 2 adult females, possibly same species).

OTHER SCOTTISH SITES FOR *MELOGONA GALLICA/VOIGTI*

Fife: Springfield Wood. NO 334 130 (VC 85).

28 May 1989, beech litter, C. Rawcliffe.

Fife: Charlestown. NT 063 835 (VC 85).

6 December 1993, female under stone in scrub at disused lime-kilns, G.B. Corbet; 6 March 1996 details as above.

Midlothian: Edinburgh, Drumbrae South. NT 192 735 (VC 83).

24 May 1995, adult female, garden, B. Saville.

RECOGNITION OF *MELOGONA VOIGTI*

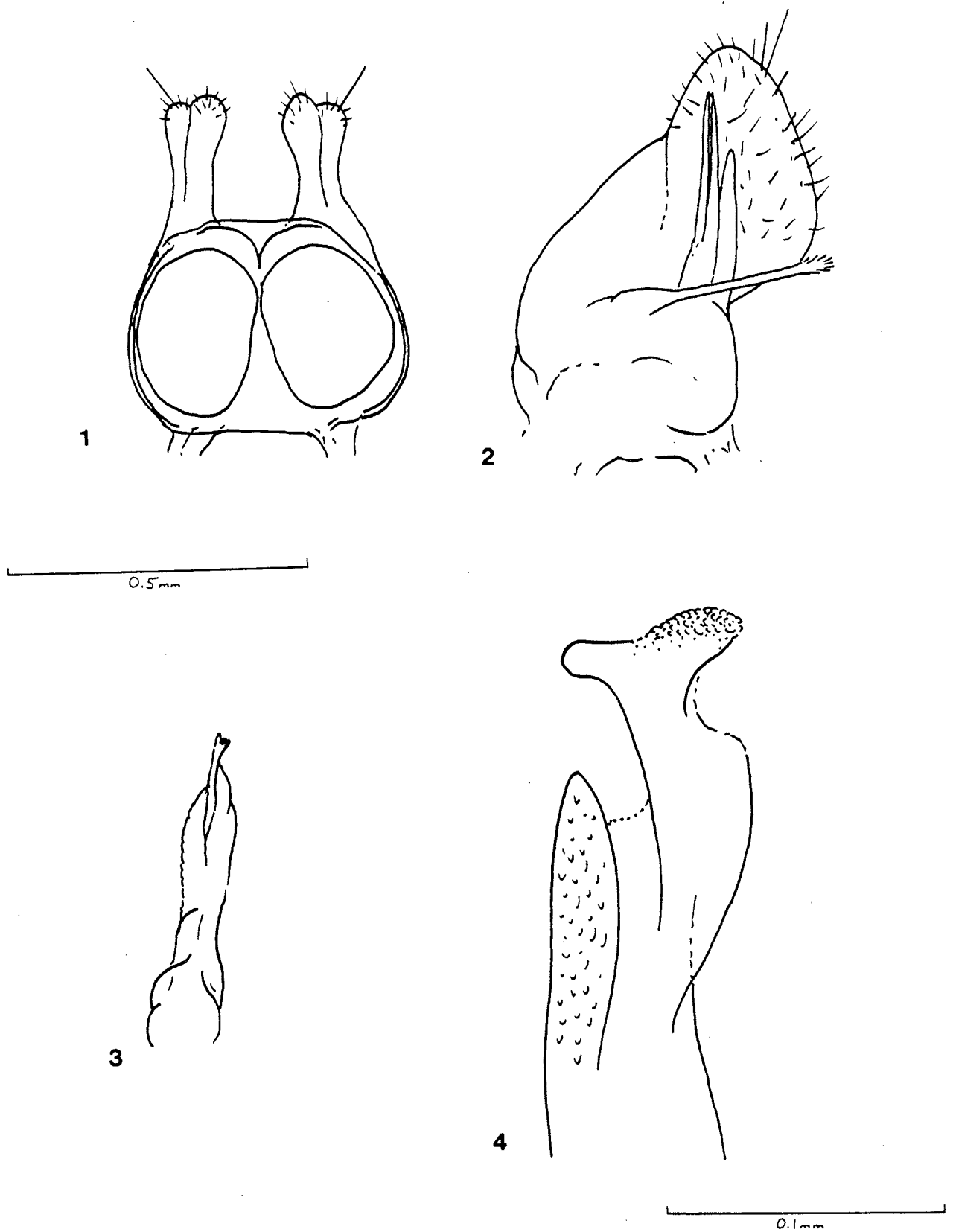
Superficially *M. voigti* is very similar to *M. gallica*, with 30 rings in the adult and similar ocelli, but perhaps a little more strongly pigmented. In the key to British species of Chordeumatidae in Blower (1985: 86) *M. voigti* will therefore key out with *M. gallica*. Adult males can be recognised by the form of the gonopods (Figures 1-4), especially the posterior paragonopods which are only slightly bilobed in *M. voigti* (Figure 1), but with conspicuously divergent lobes in *M. gallica*; and by the processes on the proximal segments of leg 12, i.e. immediately behind the paragonopods. In *M. voigti* the process on the coxa is larger than that on the (more distal) trochanter; the reverse is true in *M. gallica*. The median plate between the peltogonopods is apiculate as in *M. gallica*, not rounded as in *M. scutellare*. A detailed description was given by Brolemann (1935: 349-351) under the name *Microchordeuma voigti*.

CONCLUSION

Although all available material of '*M. gallica*' from the British Isles should be re-examined, it seems likely that the majority will prove to be *M. gallica* s.s.. This is certainly the case with the most easterly record in southern England, from Keston Bog, Bromley, London (TQ 417 642, 29 November 1980, G.B. Corbet).

Although *M. voigti* is likely to have been introduced to Scotland through trade with the continent, the wide separation of the known localities suggests that any such introduction has not been recent.

The specimens from Edinburgh have been deposited in the Royal Museum of Scotland, Edinburgh (no. NMSZ 1995.201).



Melagona voigti:

Figure 1. Posterior paragonopods (modified limb pair 11).

Figure 2. Right gonopod (limb pair 9) internal view.

Figure 3. Right peltogonopod (limb pair 8) front view.

Figure 4. Right peltogonopod (limb pair 8) side view.

ACKNOWLEDGEMENTS

Thanks are due to Charles Rawcliffe for discovery of the millipede-rich site at Dunbar and for providing specimens and data from other sites; to Bob Saville (Lothian Biological Records Centre) for collection and loan of the Dunbar specimen; and to Dick Jones for the illustrations.

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***ANTHOGONA BRITANNICA* MAURIÈS AND *POLYDESMUS BARBERII* LATZEL IN DEVON: MILLIPEDES NEW TO THE BRITISH ISLES.**

D. E. Bolton, Exeter City Museums & Art Gallery, Queen Street, Exeter, Devon EX4 3RX

R.E. Jones, 14 Post Office Road, Dersingham, King's Lynn, Norfolk PE31 6HP

INTRODUCTION.

These two species of millipede, which are the latest in a line of imports to come to light from the south west, are briefly described and illustrated. For further information on the habitats of these species see Bolton (1996).

***ANTHOGONA BRITANNICA*, MAURIÈS**

This species was collected by Steve Gregory in 1992 at Slapton Lea in Devon. He passed it to R. E. Jones for examination who realised that he had collected a similar specimen in 1983 from the same site. It was described by J-P Mauriès (Gregory, Jones & Mauriès 1993). Subsequently further specimens were collected by D. E. Bolton, G. Musker and G. Beccaloni from the Exeter Museum in the same area. At present all the known sites are in the map squares SX74, 84, 85 and 95, in and around the town of Dartmouth.

RECOGNITION OF *A. BRITANNICA*.

A. britannica is a very small chordeumid which is easily mistaken for a young individual of some thing else. It is sometimes found rolled up in a typical chordeumid fashion. On first glance it can be mistaken for a small *Craspedosoma* but it lacks the larger setae and more angular paranota that would occur on a small *Craspedosoma*. It is about 5-7mm. in length. There are around 10 or 12 ocelli per side forming a rough triangle. The body is brown in colour and there are 30 rings in all. Each segment has a slightly developed paranota bearing three setae on each side. The telson has no distinctive features (Figs. 1 & 2). The gonopods of the male are drawn (Fig. 3) and are quite distinctive.

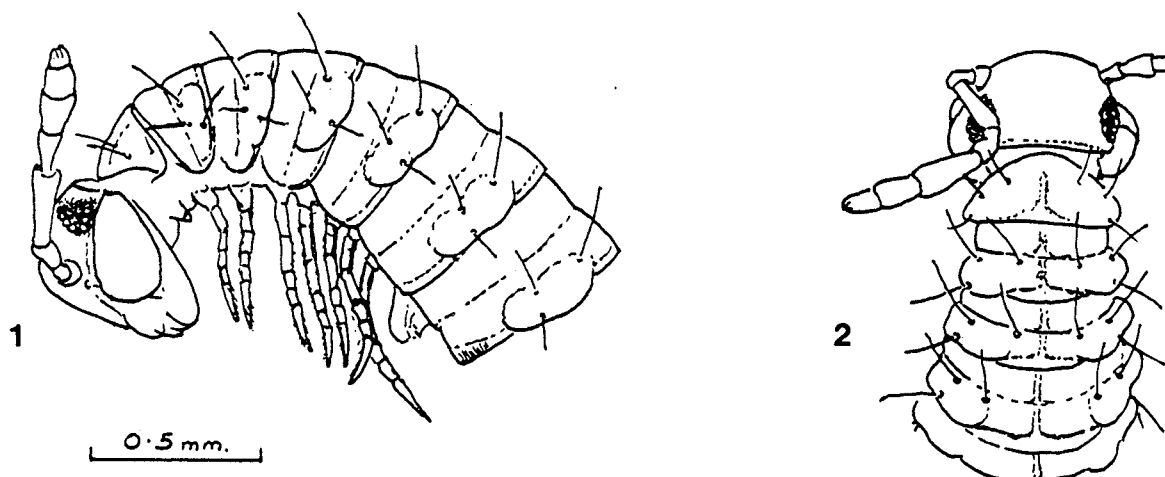


Figure 1 *Anthogona britannica* male, side view, head and first 7 segments.

Figure 2 *A. britannica* male, head and first 4 segments from above.

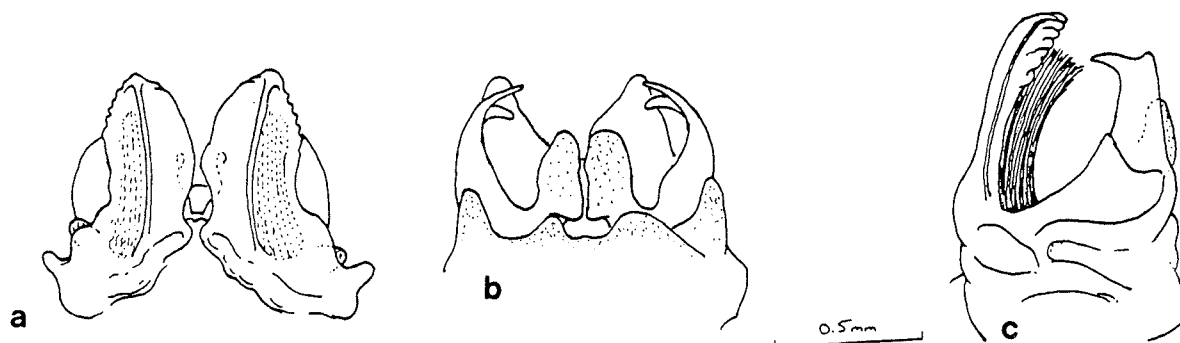


Figure 3 *A. britannica* male gonopods a) oral view, b) caudal view and c) lateral view.

***POLYDESMUS BARBERII*, LATZEL.**

An unknown species of millipede was discovered by D. E. Bolton and G. Musker who found it at several sites in and around Plymouth. It was subsequently identified as *Polydesmus barberii* Latzel. by R. E. Jones (Demange, 1981). *P. barberii* has not hitherto been recorded from the British isles but it is known from southern Europe where it is endemic. Later REJ collected it from the Plymouth area and DEB and GM found it at Dartmouth as well.

RECOGNITION OF *P. BARBERII*

This species is a typical *Polydesmus* but it is immediately recognisable from any native species by the fact that it is white. It is almost without pigment, although the antennae are tinged pink in live individuals, and it recalls a large *Brachydesmus superus* at first glance (Blower 1985). Length is about 14mm. The male is easily identified by the characteristic male gonopods (Fig. 4). The female is also easily identified by its colour, the fact that it has epigynal flanges which are roughly triangular and the coxae of the third pair of legs have a pronounced point (Fig. 5).

Specimens of both species are deposited in the Exeter Museum and the types of *A. britannica* are deposited at the British Museum (Natural History).

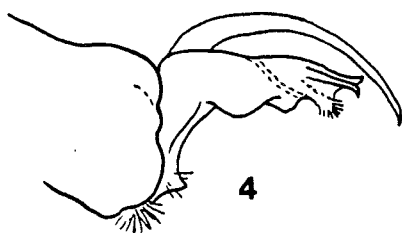
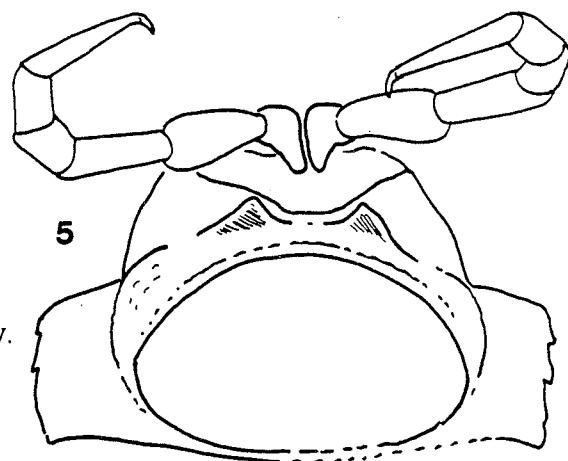


Figure 4 *Polydesmus barberii* male gonopods, lateral view.

Figure 5 *P. barberii* female, epigyne



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***POLYDESMUS BARBERII* LATZEL AND *ANTHOLOGONA BRITANNICA*
MAURIÈS IN DEVON.**

D.E. BOLTON

INTRODUCTION

Survey work for molluscs in Devon has resulted in the discovery of *Polydesmus barberi* Latzel, a species of millipede new to the British Isles (British Myriapod Group Newsletter 23 1995) and the identification of several new localities for *Anthogona britannica* Mauries first described from Slapton Ley Nature Reserve in 1993 (Bolton & Jones, 1996).

Since the late 1980's staff in the natural history section of the Royal Albert Memorial Museum in Exeter, Devon, have been undertaking a systematic survey of terrestrial and freshwater molluscs in Devon. The objective is to determine species distribution at the 2 x 2km scale by means of on-site observation and by sampling. On-site surveys have varied according to habitat as well as considerations such as time and access, but normally include examination of a broad spectrum of representative physical and biotic features, such as rock exposures, both natural and artefact, the undersides of stones and rocks, standing and fallen trees and a variety of dumped rubbish. Terrestrial sampling is by collection of leaf debris, plant remains and inorganic material. Samples of around 10 litres are dried in a wind tunnel then sieved into several fractions for examination by the naked eye or under a lens or binocular microscope.

On the 24th February 1995, DEB and Geoff Musker visited Central Park in the Pennycomequick area of Plymouth (NGR20 476 564). Searching independently both encountered several specimens of a moderately large millipede unusually conspicuous on account of their apparent lack of pigment, contrasting them against the dark humic litter. Individuals were found in a variety of locations, most abundantly under debris of bricks and concrete on a moderate slope under mixed conifers, where *Hedera helix* was the dominant ground flora. Further searches revealed specimens in other parts of the park and the adjacent cemetery. Associated species were the millipedes *Brachydesmus superus* Latzel, *Polydesmus angustus* Latzel, *Ophiulus pilosus* (Newport) and *Nanogona polydesmoides* (Leach) and centipedes *Lithobius microps* Meinert, *Haplophilus subterraneus* (Shaw), *Cryptops parisii* Brolemann and *Brachygeophilus truncorum* (Bergso and Meinert). A visit to Weston Mill Cemetery, Plymouth (NGR20 457 575) on the same day resulted in the discovery of another population with the associated millipede *Polyxenus lagurus* (Linne) and centipedes *Lithobius forficatus* (Linne), *Schendyla nemorensis* (CL Koch) and *H. subterraneus*.

Most, if not all, specimens collected were found to be mature but not attributable to any described in Blower (1985). Specimens of males and females were passed to R.E. Jones who identified them as *P. barberi*.

DEB and GM returned to Central Park on 6th April 1995 to participate in a video recording by Westcountry TV for a news item announcing the discovery of *P.*

barberii. Specimens were as abundant as during the first visit and some were found under the first piece of debris that was turned over. They were easily found in a variety of situations including the undersides of large boulders, chosen for photogenic reasons rather than for the practicality of turning then replacing them.

Further finds of *P. barberii* were made on the 3rd November when several immature specimens were found at Kingswear Cemetery, South Devon, SX 889 519, during a visit by DEB, GM and George Beccaloni. The microsite was a small pile of detached mosses and lichens raked together upon a grave. No other specimens were found at this location.

DEB again encountered mature specimens on 1st December 1995 during a search of a roadside wood above the head of Old Mill Creek, in the parish of Dittisham NGR20 853 521. This site lies across the Dart estuary from Kingswear. Specimens were located at the interface between the previous seasons rotted leaf litter and freshly fallen leaves of hazel (*Corylus avellana*), ash (*Fraxinus excelsior*) and oak (*Quercus* spp.). *Mercurialis perennis*, *Crysosplenium oppositifolium* and *Phyllitis scolopendrium* were representative of the ground flora remaining in leaf. Further searches and sampling of roadsides and woodland showed that the species was present in four tetrads centred upon Old Mill Creek. Most specimens examined were mature with a preponderance of males. Fewer than 5% of individuals were immature.

A description of *Anthogona britannica* and an account of its discovery is given by Gregory *et al.* (1993) and Bolton & Jones (1996). A further specimen was isolated from a leaf-litter sample collected by Leigh Lock from The Grove, Brixham on 25.ix.1991. The Myriapoda were not examined until July 1995 when the single specimen was forwarded to REJ who identified it as an immature *A. britannica*. Specimens of *A. britannica* were identified from leaf-litter samples collected in the Dartmouth area on 3.xi.1995. Respectively these collections and the associated myriapods were:

Sugary Cove, nr Dartmouth Castle, Dartmouth, NG20 885 501; leaf debris beneath scrambling ivy (*H. helix*) on steeply inclined strata of exposed Dartmouth slates, c 5m above EHW, with *B. superus*, *Chordeuma proximum* Ribaut, *Cylindroiulus punctatus* (Leach) and *Lithobius variegatus* Leach.

Above Ladies Cove, Dartmouth, NGR20 886 496; steep seaward slope, low sycamore (*Acer pseudoplatanus*) over ground cover of ivy and *Phyllitis scolopendrium* with *C. proximum*, *Enantiulus armatus* (Ribaut), *Glomeris marginata* (Villers), *Julus scandinavicus* Latzel and *Melogona gallica* (Latzel).

On 15.xi.1995 further locations were discovered. These were:

Sea cliff west of Leonards Cove, Stoke Fleming, NGR20 860 478; steep seaward slope above old wave platform on Dartmouth slates; thin soils with fescues dominant and large mounded growths of *Armeria maritima* and a sheltered gully with deeper accumulations of humic litter beneath *Silene uniflora*, *Beta vulgaris ssp maritima*, *Dactylis glomerata*, *Brassica oleracea* and *Teucrium scorodonia*; in associated with *Omatoiulus sabulosus* (and *Cylindroiulus latestriatus* (Curtis)).

Mill Hill Copse, Stoke Flemming, NGR20 851 481; a small disused and overgrown quarry in Dartmouth slates overhung by mature trees of beech (*Fagus sylvaticus*) and sweet chestnut (*Castanea sativa*) and with young sycamore on quarry floor: in drifted accumulations of leaf-litter beneath quarry face; associated with *B. superus*, *Blaniulus guttulatus* (Fabricius), *Brachyiulus pusillus* (Leach), *G. marginata*, *J. scandinavicus*, *Melogona scutellare* (Ribaut), *O. pilosus*, *B. truncorum*, *L. microps* and *L. variegatus*.

Cliffs above Strete Beach, Strete, NGR20 837 459: steep face of low cliff in head, overlying Dartmouth slates, unstable with some exposed soils between clumps of *Dactylis glomerata*, *Silene uniflora* and scrubby areas of *T. scorodonia*, *Rubus fruticosus* agg., *Ulex europaeus* and *Urtica dioica*; in company of *B. superus*, *C. proximum*, *L. microps*, *L. variegatus* and *Schendyla nemorensis*.

The most recent collections are from around Old Mill Creek in the parish of Dittisham, north of Dartmouth. This was on the same day, 1.xii.1995 and in the immediate vicinity of the sites reported for *P. barberii* in this article. One collection was made in which one specimen of *A. britannica* was associated with several individuals of *P. barberii*. A description of the site is as follows:

Hill Copse, Raleigh Estate, Dittisham; NGR20 864 522; small area of sycamore wood established on ?quarry spoil; sloping ground, well drained. *A. britannica* and *P. barberii* with *C. proximum*, *B. superus* and *C. punctatus*.

A. britannica was also found in a sample taken from beneath ivy on top of a creek side wall and from the base of a low roadside retaining wall which is overhung by deciduous trees including oak and hazel, at Old Mill Creek, in Dittisham; NGR20 861 519. Other myriapods were *Tachypodoiulus niger* (Leach) and *L. microps*.

During a visit to Slapton on 8.xii.1995 *A. britannica* was found in a closed sward of fescues on the Ley side of the beach road, NGR20 829 444. This site is close to one of Gregory's original localities. *C. latestriatus* and *E. armatus* were the only other myriapods found in close association but both these species were in abundance.

Further finds were made at Burlestone Wood, near Gara Mill, Strete, at NGR 817 479 and 818 481. Both sites included mixed deciduous woodland with deep leaf debris of sweet chestnut and beech with lesser quantities of oak, ash and hazel leaf litter. the first site included an area of sandy alluvial ground by the River Gara where there was a marshy, tall herb community in association with *C. oppositifolium*. Common to both sites were *B. superus*, *E. armatus* and *G. marginata*.

A male and female *A. britannica* were isolated from a preserved collection of invertebrates which I had made from a litter sample collected by M. R. Hughes from Lower Stutlebury Wood, Leigh, Churchstow, NGR 718 460. The wood was a sycamore/sweet chestnut coppice.

DISCUSSION

Anthogona britannica, at the time of writing, is known only from South Devon, VC3. *Polydesmus barberii* was originally described from the French Alpes-Maritime but has

recently been found in VC3 and is not known from elsewhere in the British Isles. Both species have been discovered in new localities and are known to be consociated in one location. Gregory *et al.* (1993) record *A. britannica* as being well established at Slapton and very recent records from the area confirm this. The recent extension of its known range, from Slapton, north to Brixham and west to Churchstow, and the frequency of its collection in coastal samples, give support to the contention that it has been long established in south Devon. A systematic survey of the land and freshwater molluscs of Devon, still in progress, has demonstrated that most recorded species of millipede are widespread across the county, and that those with an affinity for coastal habitats are found near both North and South coasts. The apparently restricted distributions, within the vice county, of both species is not mirrored by any native millipede. Both species are known to be mature in the winter months. Mature males of *A. britannica* are recorded from 18 October 1983 (R.E. Jones), 19 October 1992, 3 and 15 November, 1, 8, 29 December (D.E. Bolton) and 25 February 1992 (S.J. Gregory). An immature male was collected on 25 September 1991 (L. Lock). Mature males of *P. barberii* were recorded on 24 February, 6 April and 1 December 1995 (D.E. Bolton & G. Musker). Immatures were present on 3 November and 1 December.

The distribution of *P. barberii* I would interpret as indicating a species which is a relatively recent introduction to this country. The first population was discovered in an urban area close to an international port with a busy cross-channel service and a large naval presence. It was found in both of the Plymouth cemeteries that were searched. The second population was also in a cemetery but that and subsequent populations were in a rural setting but very close to a busy international yachting centre with a long naval association. Without further detailed research we cannot define the limits to these populations but the Kingsbridge site may be a recent extension from the apparently more widely established Dartmouth populations. There may well be a connection between the Dartmouth and Plymouth populations and the putative French origins which relates to their common naval associations, perhaps even to the Napoleonic wars (G. Musker pers. comm.).

A. britannica has been found in 14 out of 56 terrestrial samples taken in the 10km squares SX74, SX84, SX85 and SX95 between 27.x.1995 and 12.I.1996. This makes it the third most frequently recorded millipede in these samples after *B. superus* and *C. proximum*, with *E. armatus* in 13 samples.

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OXFORDSHIRE CENTIPEDES

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INTRODUCTION

This paper is the second on the distribution of Myriapoda within the modern county of Oxfordshire. As is the case with millipedes (Gregory, 1995), no work was under-taken on Oxfordshire centipedes until the formation of the Bureau of Animal Population Studies at Oxford University in the 1920's.

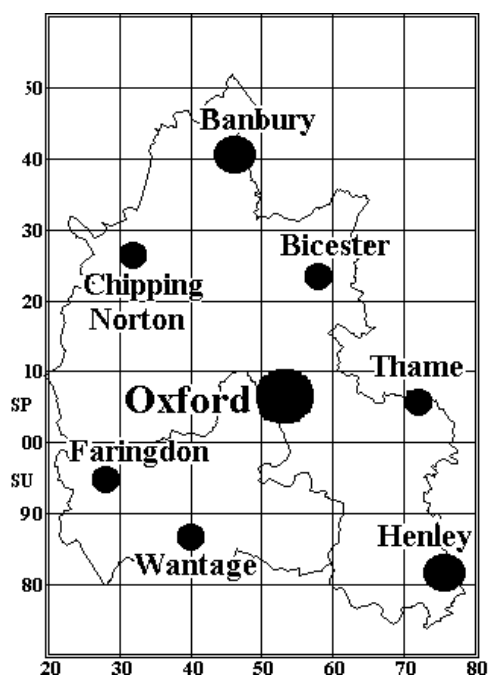
The current survey was started following the collection by the author of several species of Myriapoda considered to be rare in Britain, but which had been previously collected locally by the Bureau. In order to put these, and other species, into their true county context a more detailed survey was made across the county. It is hoped that some objective statement can now be made about the distribution of centipedes in Oxfordshire.

SURVEY AREA

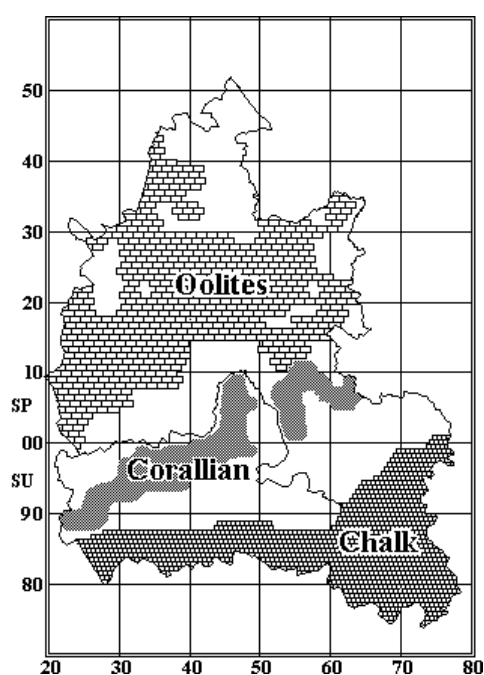
The records presented in these maps cover the current administrative county of Oxfordshire (Map 1). This was created in 1974 by the amalgamation of Watsonian vice-county 23 (Oxfordshire) and the north west part of vice-county 22 (Berkshire). The old county boundary followed the course of the River Thames and is shown on the maps. This gives an area of 260,944 hectares which falls within the following 39 10km grid squares:

SU(41)28, SU29, SU38, SU39, SU48, SU49, SU58, SU59, SU67, SU68, SU69, SU77, SU78, SU79, SP(42)20, SP21, SP22, SP23, SP30, SP31, SP32, SP33, SP34, SP40, SP41, SP42, SP43, SP44, SP45, SP50, SP51, SP52, SP53, SP54, SP60, SP61, SP62, SP63 and SP70.

The geology and principle habitats found in the county are described by Gregory (1995). In brief, Oxfordshire is a damp and limy county. The underlying geology is a series of exposures from the Jurassic in the north to the Cretaceous in the south east. There are three main outcrops of calcareous bedrock, Oolitic limestones, Corallian limestones and Chalk, as indicated in Map 2. Locally small areas may be masked by acidic clay drift of more recent origin. Between these three north-west facing escarpments are two low lying vales where neutral to calcareous clays are exposed. The county is dominated by the River Thames and its tributaries which flow against the slope of the prevailing escarpments. Like most counties in the lowland south much of the countryside supports extensive agriculture, with just 8% of land considered to be of high conservation value. This is mainly deciduous woodland but river-side meadows and calcareous fens are well represented in the county.



Map 1. Modern county of Oxfordshire



Map 2. Outcrops of calcareous rock

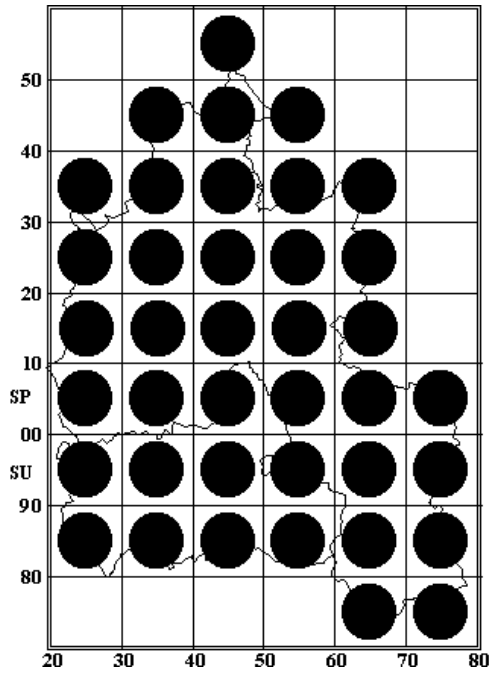
HISTORICAL RECORDS

There is no reference to Myriapoda in the Victorian County History (Salzman, 1938), which collated much of the biological recording in the county around the turn of the century. It is not clear whether this is due to the absence of recording or because no one was available to write the relevant text. No further attempt has been made to search the literature for old records. The following account is based on the computerised database held at the Oxfordshire BRC.

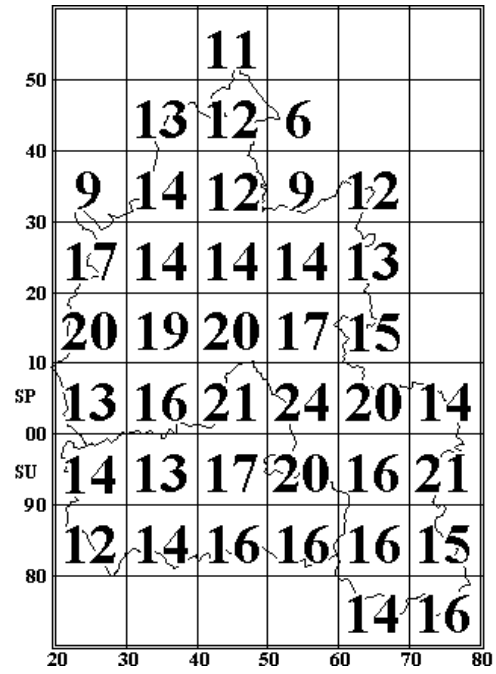
Nothing appears to be known of Oxfordshire centipedes until the creation of the Bureau of Animal Population Studies, by Charles Elton, at Oxford University in the 1920's. The earliest centipede records are for *Lithobius borealis* and *L. crassipes* from Bagley Wood near Oxford (SP50) in 1933. Most of the centipede records date from the 1940's and 1950's. Collections were made mainly from Wytham Woods near Oxford (SP40) and the survey records are known locally as the 'Wytham Survey'. However, other sites in the county were also visited and species records were obtained for many under-recorded taxa in addition to centipedes.

The Wytham Survey pioneered many new sampling techniques, including Tullgren Funnel extraction and pitfall trapping of invertebrates. Specialists were often brought in to identify collected material. During this period all the rural species known in the county were first collected. In addition to *L. borealis* other species of note collected were *L. macilentus*, *L. calcaratus*, *L. muticus* and *L. curtipes*. When *Lithobius muticus* was first collected from Wytham Woods in 1950 it was the fourth British record. Barber & Keay (1988) note that 40 of the 105 British records for this species are from Wytham Woods.

Other species recorded were *Haplophilus subterraneus*, *Schendyla nemorensis*, *Strigamia crassipes*, *S. acuminata*, *Geophilus carpophagus*, *G. electricus*, *Necrophloeophagus flavus*, *Brachygeophilus truncorum*, *Cryptops hortensis*, *Lithobius variegatus*, *L. forficatus*, *L. melanops* and *L. microps*. By the end of the 1950's the county list stood at 19 species.



Map 3. Coverage map



Map 4. Number of species recorded per 10km grid square

RECENT RECORDING

Further recording in the county was limited until in the late 1980's when collections were made by S.P.Hopkin and D.T.Bilton. S.P.Hopkin made several excursions into the county to collect various invertebrate taxa. D.T.Bilton was based at Oxford University for a number of years and did much collecting from Oxford city centre where he found *Brachyschendyla dentata*, *Clinopodes linearis* and *Cryptops anomolans* to add to the county list. Collections were also undertaken from National Trust properties by K.N.A.Alexander. In this period *Geophilus oligopus (insculptus)* was also collected adding four species to the county list.

Since 1990 much effort has been put into filling in the gaps for the common species and defining the ranges of more local ones. Records are site based, within 10km national grid squares, and are made in accordance with guidelines given by the British Myriapod Group recording scheme. These are compatible with the tetrad (2km x 2km) recording unit used by the Oxfordshire BRC.

All 39 10km grid squares in the county have been visited (Map 3). Within each 10km square several sites with contrasting habitats were sampled. These included not only semi-natural sites such as ancient woodlands, grasslands, meadows and fen, such as those identified by the

County Nature Conservation Forum, but also synanthropic sites. For example collections were made from about 200 churchyards throughout the county. Effort was made to visit sites in inaccessible and under-recorded areas. Most of the fieldwork was undertaken between October and May since many species seemed much more elusive in the summer months. Since this is primarily a tetrad survey most sites were visited just once. A few have been more extensively surveyed and should provide base-line species lists for the county.

As many microsites 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. Searches were also made amongst leaf-litter and moss and also under the bark of fallen and standing dead wood. Soil or rubble in 'promising spots' was also hand sorted in the field. There has been a deliberate bias in looking for the more elusive species on the assumption that the common species will be found anyway. With practice it became possible to find many species simply by searching the appropriate microsite within suitable habitat. Much additional material has been collected by John Campbell at the Oxfordshire BRC and passed on for determination, including some pitfall trap specimens.

Five further species have been added to the Oxfordshire list as follows: *Henia brevis*, *Geophilus osquidatum*, *Cryptops parisi*, *Lithobius pilicornis* and *Lamycetes fulvicornis*. The number of centipedes now recorded from modern Oxfordshire stands at 28. All species have been collected from vice-county 23, but *B. dentata*, *C. linearis* and *L. pilicornis* are not yet known from that part of vice-county 22 which falls within the modern county boundary. The number of species recorded from each 10km square is shown in Map 4.

RECORDS AND VOUCHER SPECIMENS

Biological recording for the county is co-ordinated by the Oxfordshire Biological Records Centre, part of the County Museum Service. Full details of all records are held there on a computerised database (using RECORDER software). To the end of September 1995 this amounts to 2817 centipede records. The majority of these records are post 1990 and mostly attributable to the author and J.M.Campbell. The species maps have been generated from the O.B.R.C. data-base using DMAP mapping software via the R2DW linkage programme.

The total number of records for each species is shown in Table 1. Species are ranked by the number of 10km squares within which they have been found in the county. The equivalent rank in Britain, calculated from the number of 10km square records given in Barber & Keay (1988), is also noted.

Of the post 1990 records at least one species record per 10km square has been submitted to the national recording scheme. A selection of Oxfordshire material has been lodged in the collections of the County Museum Service. A small working collection is held by the author.

Table 1: Species list for Oxfordshire showing relative abundance, rank in county and equivalent rank in Britain.

Species	Number of 10km sqs.	Number Records	Rank in County	Rank in Britain
<i>Haplophilus subterraneus</i>	37	154	7	9
<i>Schendyla nemorensis</i>	39	155	4	11
<i>Brachyschendyla dentata</i>	10	11	19	28
<i>Henia brevis</i>	15	16	16	26
<i>Strigamia crassipes</i>	26	59	13	17
<i>Strigamia acuminata</i>	30	70	10	13
<i>Clinopodes linearis</i>	7	9	23	27
<i>Geophilus carpophagus</i>	25	82	14	7
<i>Geophilus electricus</i>	13	22	18	18
<i>Geophilus osqidatum</i>	7	20	22	24
<i>Geophilus oligopus</i>	26	69	12	12
<i>Necrophloeophagus flavus</i>	38	227	5	5
<i>Brachygeophilus truncorum</i>	35	131	8	6
<i>Cryptops anomalans</i>	5	7	24	25
<i>Cryptops hortensis</i>	34	135	9	10
<i>Cryptops parisi</i>	5	6	25=	23
<i>Lithobius variegatus</i>	26	181	11	2
<i>Lithobius forficatus</i>	39	538	1	1
<i>Lithobius melanops</i>	39	257	3	8
<i>Lithobius macilentus</i>	16	25	15	19
<i>Lithobius borealis</i>	5	6	25=	14
<i>Lithobius pilicornis</i>	1	2	28	21
<i>Lithobius calcaratus</i>	8	13	21	15
<i>Lithobius muticus</i>	14	30	17	20
<i>Lithobius crassipes</i>	38	171	6	3
<i>Lithobius curtipes</i>	8	17	20	22
<i>Lithobius microps</i>	39	401	2	4
<i>Lamyctes fulvicornis</i>	4	7	26	16

INTRODUCTION TO THE SPECIES MAPS AND ACCOUNTS

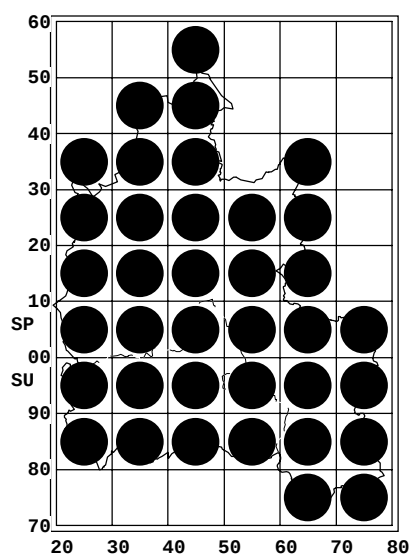
Records are shown in two time categories:

Post 1980 records (mostly post 1990) are shown as solid dots (●).

Pre-1980 records (mostly 1942-1959) are shown by open circles (○).

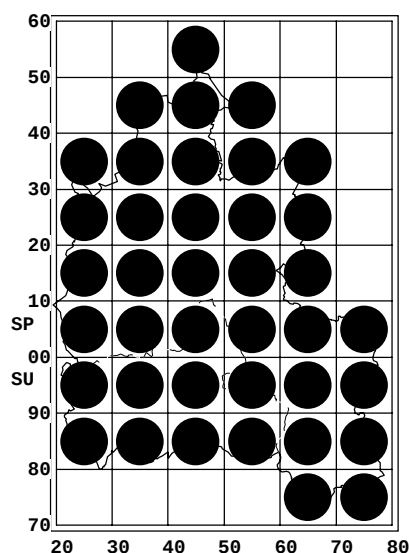
When there is more than one record per 10km square only the most recent is shown on the maps. All species have been collected from both vice-county 22 and 23 unless noted.

SPECIES MAPS AND ACCOUNTS



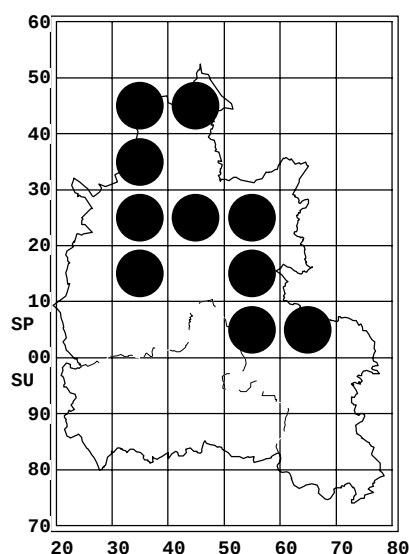
Haplophilus subterraneus (Shaw, 1789)

A large and conspicuous species commonly encountered under stones and dead wood in synanthropic sites such as disused quarries and churchyards. In keeping with this synanthropic preference the first county record is from Blenheim Park (SP41) in 1958. It is occasionally found in semi-natural sites such as woodlands but typically close to the edges and often associated with dumped garden rubbish at such sites. In the south-west of the county it seems rather more numerous, though this is not obvious from the 10km maps presented here.



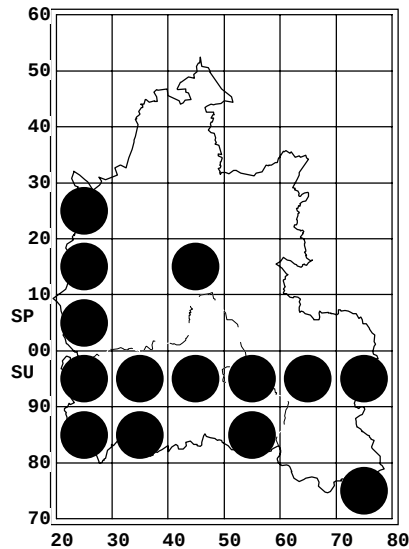
Schendyla nemorensis (C.L.Koch, 1837)

This common, but rather elusive, species occurs in a wide variety of habitats from ancient woodland and calcareous grassland to churchyards and gardens. It is usually found under stones and within soil. Occasionally it is found under moss and bark on dead wood where it can be over-looked as *B. truncorum*. First collected from Wytham Woods (SP40) in 1951, it is apparently more common in Oxfordshire (ranked 4th) than in Britain as a whole (ranked 11th).



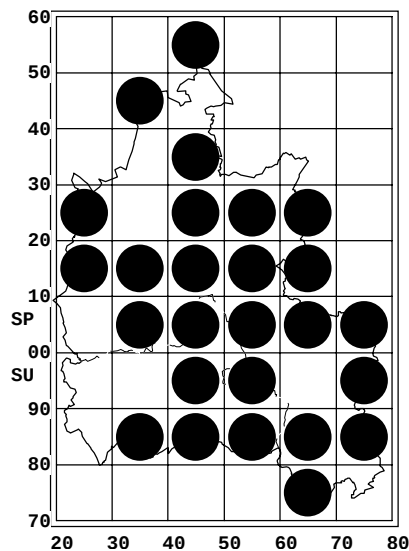
Brachyschendyla dentata Brolemann & Ribaut, 1911

vc.23 only: This small and elusive species was first recorded by D.T.Bilton from Oxford city (SP50) in the late 1980's. Subsequently it has been collected from several churchyards with sandy or friable soils and is currently ranked 19th. Careful searching of the underside of large stones (e.g. stacked gravestones), or by hand-sorting the superficial soil layer beneath, has revealed single specimens, usually in the winter months. It may prove widespread in urban areas but is apparently absent from the south of the county, where the equally scarce *H.brevis* occurs. Nationally it is ranked 28th, the lowest of the Oxfordshire species.



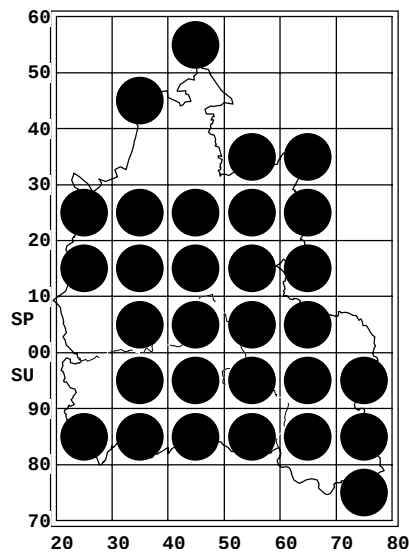
Henia brevis Silvestri, 1896

Another small elusive soil dwelling centipede which, like *B. dentata*, is found under large stones in gardens and churchyards, especially in winter. First collected, in association with *C. linearis*, from a North Oxford garden (SP41) in 1991, it is widespread in at least the south of the county. The apparently mutually exclusive distribution with *B. dentata* would repay further study. Though currently ranked 16th in the county (compared to 26th in Britain) it is probably under-recorded and may prove widespread in urban sites.



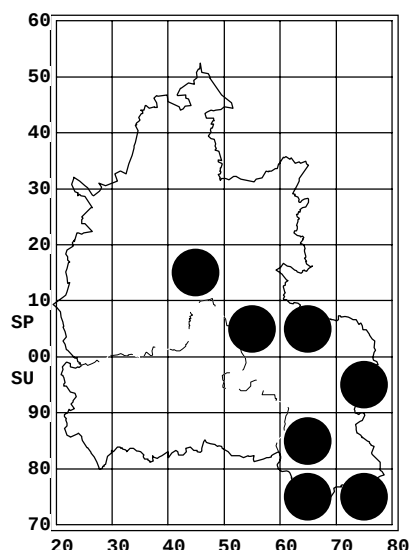
Strigamia crassipes (C.L.Koch, 1835)

First recorded from Wytham Woods (SP40) in 1949 this characteristically rural centipede is widely found in woodland, scrub and river-side meadows throughout the county. It is often found beneath or within dead wood, more rarely in litter and moss. However it is never numerous and usually only single specimens are found.



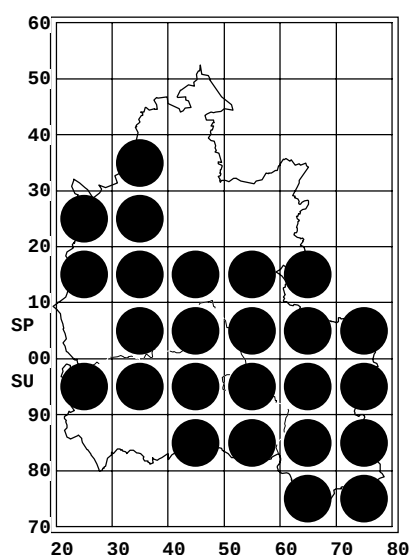
Strigamia acuminata (Leach, 1814)

Another widespread and distinctly rural species found in similar microsites to *S. crassipes*, though it is often found at wetter sites, such as wet woodland, fen and marsh. However the two species often occur together, especially in ancient deciduous woodland. It was first collected in the county in 1947 from Wytham Woods (SP40).



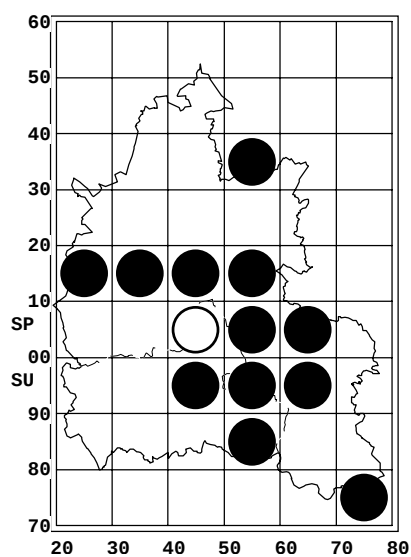
Clinopodes linearis (C.L.Koch, 1835)

vc.23 only: An uncommon species with a distinct south-easterly bias in the county. It was first recorded at University Parks, Oxford (SP50) in 1989 (Bilton, 1990). All other reliable records are from gardens or churchyards, where it is often found under large stones, or amongst soil and debris in neglected corners. Being of similar appearance to the common *H. subterraneus* it may have been overlooked at some sites. An old record from chalk grassland (OBRC records) needs confirming and has not been mapped.



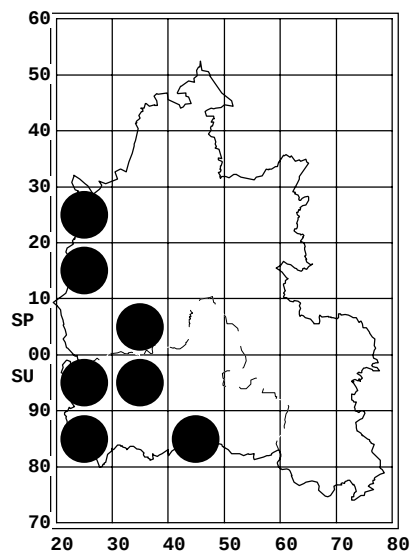
Geophilus carpophagus Leach, 1814

Both the rural and urban forms (Eason, 1979) are frequent in Oxfordshire (ranked 14th together) though apparently less so than in the rest of Britain (7th). As noted by Lewis (1989) there appears to be no overlap in either the number of leg bearing segments or the habitat preference of these two forms. The 'small red' rural form is found under stones and dead wood in woodlands on more acidic soils. The 'large grey' urban form is usually found above ground in synanthropic sites such as churchyards, gardens and farmyards. Typical micro-sites are under the bark of trees, especially yew (*Taxus baccata*) and pine (*Pinus* spp.) or under stones on walls.



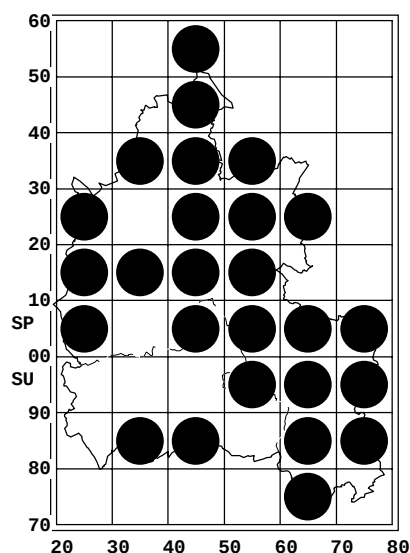
Geophilus electricus (Linné, 1758)

An uncommon but widespread species over much of the county. Most records are from churchyards where it inhabits friable soils. It has also been found in ancient woodlands and calcareous grasslands, such as at Wytham Woods (SP40) where it was first collected in 1951. It is similar in appearance to the common *H. subterraneus* and may possibly have been overlooked at some synanthropic sites.



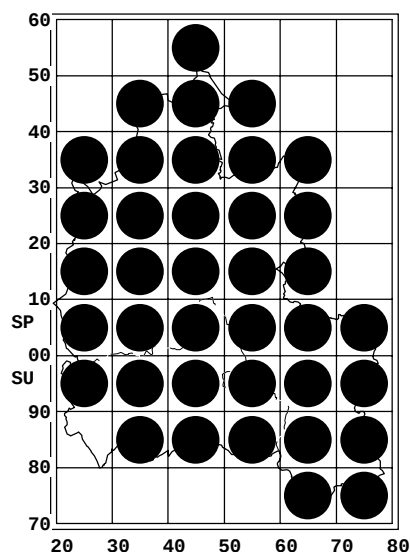
Geophilus osquidatum Brolemann, 1909

In Oxfordshire this species is at the edge of its British range with records concentrated in the south-west of the county, mainly in vc.22. First collected from a garden in Burford (SP21) in 1991, where it has been repeatedly taken from a vegetable plot in association with *H. subterraneus*. Most records are from churchyards or gardens where it occurs under stones and amongst soil. It has been collected with *N. flavus* and small specimens have proved difficult to separate from this common species.



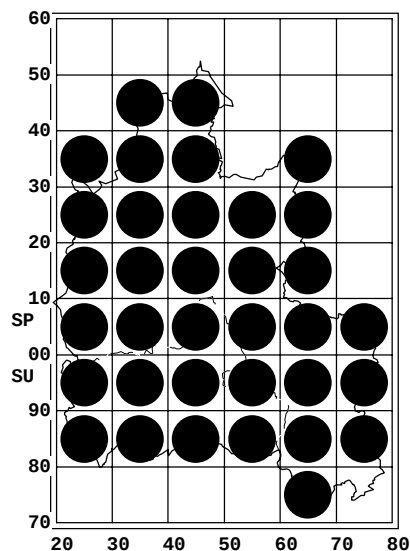
Geophilus oligopus (Attems 1885)

This soil dwelling species is widely recorded from the county, though only added to the county list comparatively recently in 1982 (Wytham Woods, SP40). It is typically found under stones in synanthropic sites such as churchyards, but less commonly, also in a variety of semi-natural sites. In the south-west of the county it has been much less widely collected and apparently absent from the Corallian sands.



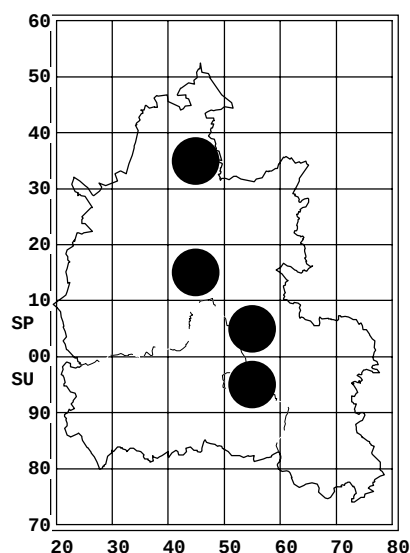
Necrophloeophagus flavus (De Geer, 1778)

First recorded from Bagley Wood (SP50) near Oxford in 1944, this is the commonest Geophilomorph in the county. Found under stones and dead wood in a variety of semi-natural and synanthropic habitats, though apparently less common in the south-west. This is in keeping with the eastern bias of this species in Britain (Barber & Keay, 1988), but it may also be partially replaced by *G. osquidatum* in synanthropic sites since the two tend to occupy similar microsites.



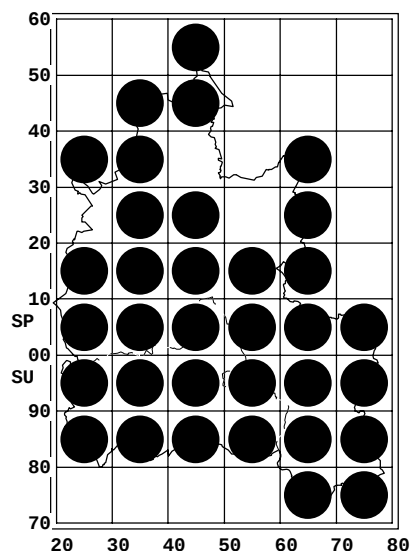
Brachygeophilus truncorum (Bergsoë & Meinert, 1866)

A small species commonly encountered under the bark of fallen timber or within rotten wood. It is typically found in rural sites and can be numerous at some, such as in damp areas within woodlands or in hedgerow ditches. It was first recorded by the Wytham Survey from Cothill Fen NNR (SU49) in 1959.



Cryptops anomalans Newport, 1844

This large conspicuous species is scarce in the county. It was first recorded from Queen's College gardens at Oxford (SP50) by D.T.Bilton in 1987. The few subsequent records are all from urban sites, including churchyards, where it has been found underneath large stones. It is probably genuinely scarce since it is too large to easily overlook.



Cryptops hortensis Leach, 1814

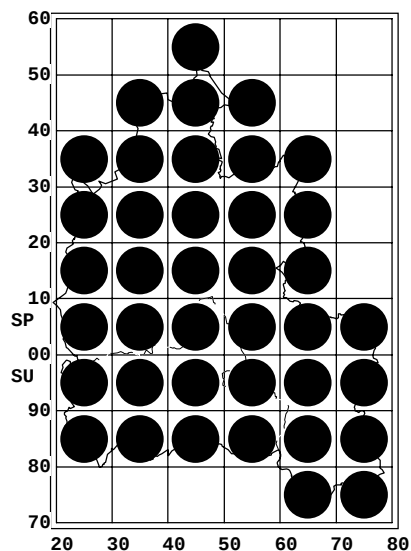
The only common scolopendromorph in the county, first recorded from Wytham Woods in 1958. It seems to be more local towards the north which is even more apparent from the tetrad maps held at the OBRC. It is found in woodland and gardens, typically under the bark of tree stumps or within compost heaps. Less commonly it is discovered under stones and dead-wood lying on the ground.



Lithobius variegatus Leach, 1813

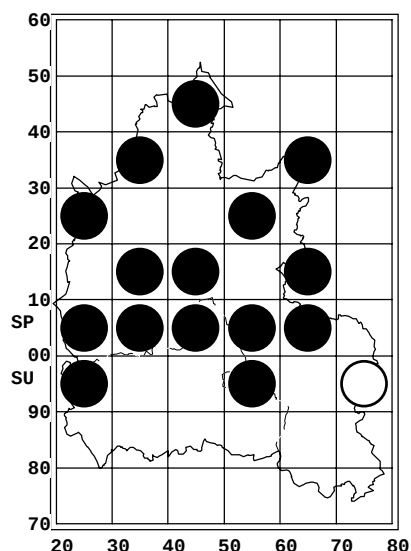
Lithobius forficatus (Linné, 1758)

By far the most commonly collected centipede in the county, no doubt due to its large size and surface activity. Despite a strong preference for urban sites, where it can be readily collected by turning stones and dead-wood, it can also be found in most rural habitats, except in areas where *L. variegatus* is common. The first county record is from Bagley Wood (SP50) in 1944.



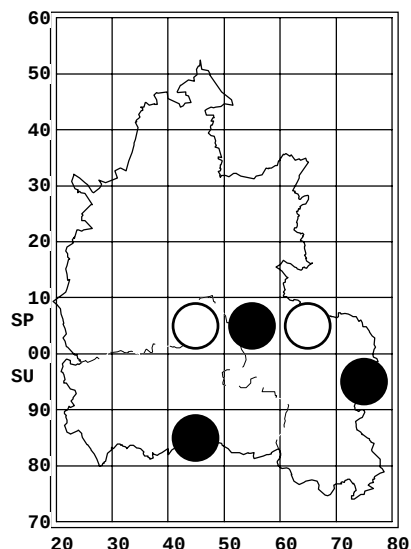
Lithobius melanops Newport, 1845

This is the 3rd most commonly recorded species in the county after the ubiquitous *L. forficatus* and *L. microps*. It is found in a variety of habitats from rural woodlands and meadows to urban churchyards, typically above ground level. Under loose bark on willow pollards and beneath moss or stones on walls it can be numerous. Nationally it seems to be less abundant being ranked 8th.



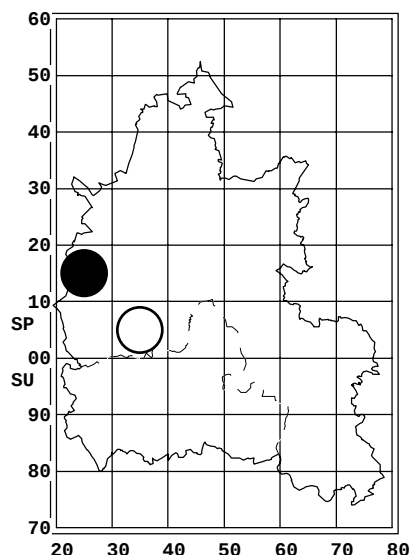
Lithobius macilentus L.Koch, 1862

The first county record for this small Lithobiid is from Wytham Woods (SP40) in 1945, where it has been widely collected on subsequent occasions. It has proved widespread throughout the county but is never numerous. Typically one or two specimens are hand-sorted from amongst deep accumulations of leaf and twig litter within deciduous woodland. It is possibly under-recorded.



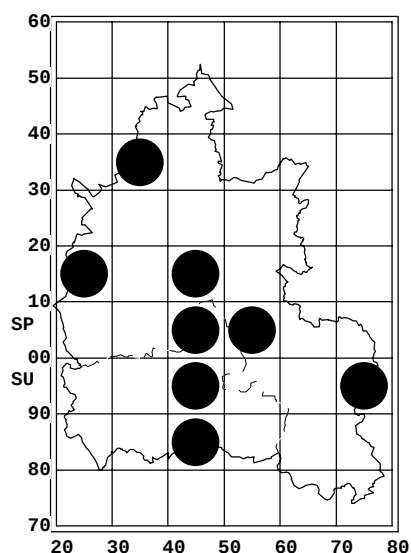
Lithobius borealis Meinert, 1868

A rare species recorded from a handful of deciduous woodlands on acidic soils in the county. It was first recorded from Bagley Wood near Oxford (SP50) in 1933 (Wytham survey), and thus the earliest centipede record for the County. It was refound there sixty years later in 1993. The Wytham survey also gives records for Wytham Woods (SP40) and Holton Wood (SP60) where this species may still occur. It would seem to be much scarcer in the county (ranked 25th) when compared to the rest of Britain (ranked 14th), perhaps reflecting the scarcity of acidic soils in Oxfordshire.



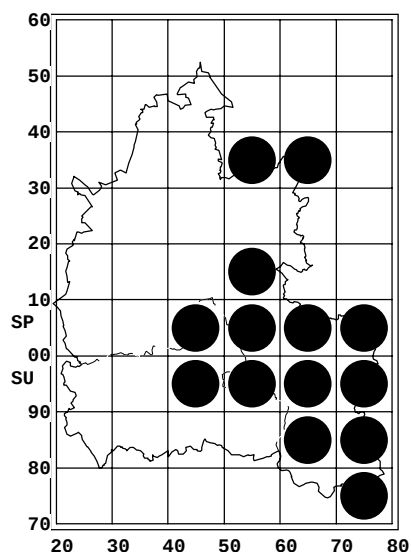
Lithobius pilicornis Newport, 1844

vc.23 only: Barber (1972) cites a record for this large Lithobiid from Bampton (SP30) but further details are not known. In 1993 it was collected by J.M.Campbell from a churchyard in the west of the county. Subsequent visits have revealed additional specimens (and another scarce synanthrobe, *C. parisi*). It has probably been introduced and has apparently replaced *L. forficatus* at the site. It may occur at other urban sites, but is believed to be genuinely rare since large Lithobiids have been routinely collected from both urban and rural sites throughout the county.



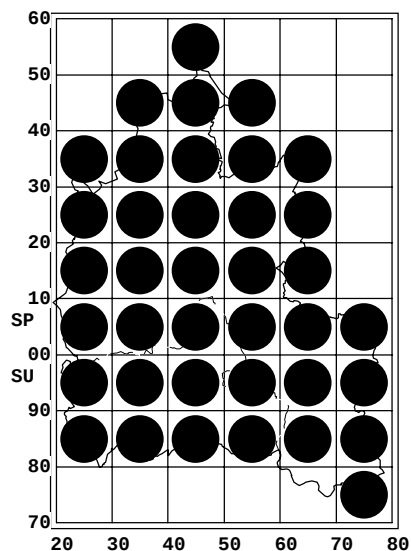
Lithobius calcaratus C.L.Koch, 1844

This uncommon species is found in dry open sites such as grassy heaths on the Corallian sands, dry calcareous grasslands on the Oolites and chalk and a disused gravel-pit in the Windrush valley. It seems to be rather elusive (ranked 21st in the county) and may prove to be under recorded. The first county record is from Wytham Woods (SP40) in 1950. It would seem to be much more widely collected in Britain as a whole (ranked 15th).



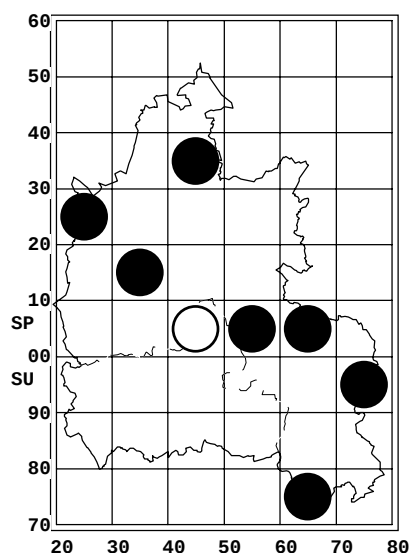
Lithobius muticus C.L.Koch, 1847

In Oxfordshire this distinctive species is at the edge of it's British range with records concentrated in the south-east. On the Chiltern chalk and Corallian limestones it can be locally frequent in both wet and dry deciduous woodlands, wherever a well developed litter layer is present. It also has been collected from calcareous grasslands where these adjoin woodlands. Isolated records occur elsewhere in the county most notably near Cottisford (SP53 & 63) in the north. It was first recorded from Wytham Woods (SP40) in 1950 and on numerous subsequent occasions.



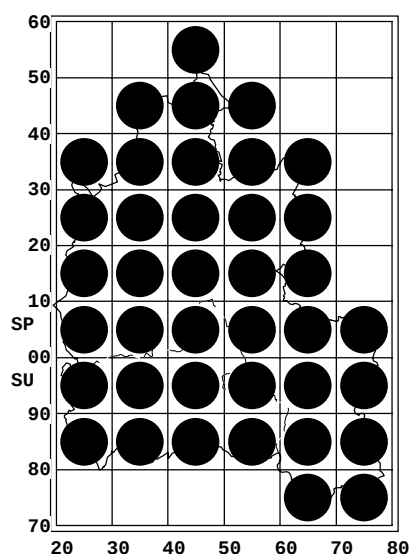
Lithobius crassipes L.Koch, 1862

A common species found mainly in rural sites such as deciduous woodland. It is readily found, and sometimes numerous, under stones, dead wood and carpets of moss. This species was first collected from Bagley Wood (SP40) in 1933, in association with *L.borealis*, representing the earliest centipede records for the county. It seems to be less common in the south despite much apparently suitable habitat. This is in keeping with the general scarcity of this species in the extreme south of Britain (Barber, 1969).



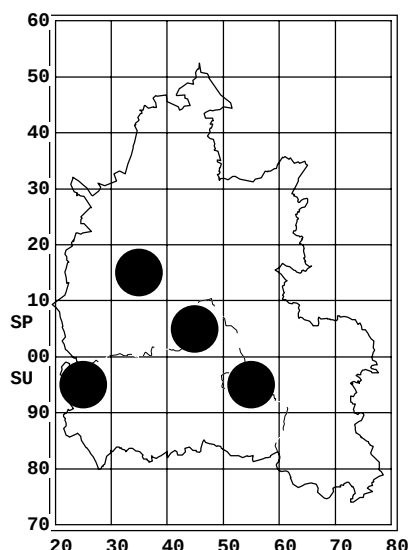
Lithobius curtipes C.L.Koch, 1847

A widespread but elusive species associated with ancient deciduous woodland throughout the county. The first county record is from Aston Rowant Woods (SU79) in 1959 (Wytham Survey) and subsequently widely recorded from Wytham Woods (SP40). The current survey has found the species difficult to locate even at known sites and it may prove more widespread in the county. It is typically collected from amongst leaf-litter or moss and has been hand-sorted from a grass tussock in mid-winter.



Lithobius microps Meinert, 1868

This is possibly the commonest centipede in the county, though currently ranked second after *L. forficatus*. Certainly its small size and subterranean habits do not assist collection. None the less it is often numerous at synanthropic sites where it can be readily found under stones or within soil. In semi-natural habitats, such as woodlands and river-side meadows, it is much less abundant but inevitably still present.



Lamycetes fulvicornis Meinert, 1868

An apparently rare species first recorded in 1992 and ranked 26th in the county. Most records are from riverside locations, such as meadows and disused gravel-pits. However recent pitfall trapping has shown it to be more widespread with records from arable fields and a dry sand-pit on the Corallian ridge. The common factor would seem to be the presence of bare, un-vegetated ground. The few records are from late-June until late-September, when collector activity is usually minimal, so it is almost certainly under-recorded. It is ranked 16th in Britain.

DISCUSSIONS

Considering the absence of coastline, the county species list would appear to be quite good. Reference to Keay (1993) shows that modern Oxfordshire (28 species) compares with other well worked counties in southern England, including land-locked Surrey (vc 17), which boasts 29 species. Reference to Map 4 shows the number of species recorded from each 10km square to be rather uniform. As was noted with the millipedes (Gregory, 1995) the richest centipede fauna seems to be in the south east of the county where there is a good diversity of habitats associated with the Chiltern Hills and the Thames valley. None the less many of the higher totals (i.e. 20+) tend to reflect well worked squares rather than hot spots. It is believed that a reasonable amount of fieldwork has been done for useful (albeit still subjective) conclusions to be made.

In general species abundance, distribution and habitat preference have been in keeping with that given in Barber & Keay (1988) and Barber (1992). Four species, *S. nemorensis*, *N. flavus*, *L. forficatus* and *L. microps*, can be said to be common and ubiquitous throughout the county. Other species such as *C. hortensis* and *L. melanops*, and the more local *G. carpophagus*, *G. electricus* and *G. oligopus*, are generally common in synanthropic sites but are much more limited in the semi-natural habitats that they occupy.

Several species, most notably the soil dwelling urban geophilomorphs, have been more widely collected from Oxfordshire than expected. Their relative abundance in the county may be mainly due to the friable calcareous soils which have developed over much of the county. It could also be due to recorder bias reflecting the effort put into surveying churchyards throughout the county.

Whatever the reason it is clear from this survey that synanthropic sites, especially old churchyards, are important for many species. Three apparently very rare geophilomorphs, *B. dentata*, *H. brevis* and *C. linearis*, were collected mainly from old churchyards and gardens throughout the county. Other scarce but typical 'churchyard' species are the Geophilomorph

G. osquidatum, the large Scolopendromorphs *C. anomolans* and *C. parisi* and the large Lithobiid *L. pilicornis*. The common *H. subterraneus* is also essentially synanthropic in Oxfordshire. Even in semi-natural sites it is typically collected from disturbed road-verges or boundary ditches.

The faunal interest of urban and suburban sites in Surrey was noted by Barber & Eason (1970) following the addition of *B. dentata* to the British list. There have been repeated requests for more records from urban areas (e.g. Barber & Keay 1988, Barber 1992, Keay 1993). With the exception of a few recorders (e.g. Lee 1993) the response has been slow. How can we claim to know the true status of a species unless all available habitats have been sampled? For example in Oxfordshire *G. osquidatum* is now known to be widespread in churchyards in the south-west of the county. It has also been recorded from a single SSSI meadow and, in the absence of these churchyard records, could be seen as a rare species occupying a vulnerable semi-natural habitat within the county. This interest is not confined to centipedes. In Oxfordshire a characteristic synanthropic fauna includes, for example, the millipedes *Nopoiulus kochii* and *Cylindroiulus vulnerarius* (Gregory 1995), the Molluscs *Boettgerilla pallens* and *Testacella haliotide* (OBRC records) and many other under-recorded taxa.

In contrast many of the Lithobiids show strong preferences for semi-natural habitats in the county. Deciduous woodland is an important habitat for several species: *L. variegatus*, *L. maciletus*, *L. borealis* and in particular *L. muticus* and *L. curtipes*. In keeping with a preference for open sites noted in Barber & Keay (1988) *L. calcaratus* inhabits heathland and calcareous grassland. The Geophilomorphs *S. crassipes*, *S. acuminata* and *B. truncorum* tend to be found in semi-natural habitats but are tolerant of a wide range of types. The most diverse centipede faunas were typically found at sites where non-calcareous soils occur. At such sites other soil invertebrates such as millipedes and snails are often poorly represented.

Even considering the limited amount of semi-natural habitat in the county, many rural species seem to be much less common than would be expected from their national distributions. The best example is *L. variegatus* which is absent from much of the clay vales in the county. Barber & Keay (1988) comments that this species is occasionally absent from areas where it would be expected to occur. This is certainly true there. *L. borealis* is also conspicuously uncommon in Oxfordshire. This is considered to be a species typical of acid soils (Barber & Keay 1988) so it is perhaps not surprising that it is scarce in this lime rich county. This may also explain the relative paucity for the rural form of *G. carpophagus* and *L. calcaratus*. However, in Oxfordshire the latter species has also been collected from short turf calcareous grasslands. This is a fairly widespread habitat in the county so the reason for its scarcity is unclear, though possibly in keeping with a north-eastern bias in Britain. Considering the relatively large number of pre-1960 records for species such as *L. borealis* and *L. curtipes* it is possible that they have decreased in abundance in recent years.

THE FUTURE

Being a land locked county there would appear to be few species left to add to the county list. *Henia vesuviana* is perhaps the most likely candidate and may be found lurking in a synanthropic site somewhere. Outlying populations of *Lithobius piceus* or *L. tricuspis* may be

found at woodland sites. There may be some introduced species hiding in the hot houses at the Oxford Botanic Gardens, such as those known from Kew or Edinburgh.

The collection of data is on-going, though recording effort is more limited. Continued fieldwork will enable long-term changes in species abundance and distribution to be observed. For example *L. microps* has been shown to be replacing *L. curtipes* in Sweden (Barber 1992). Similar changes may be occurring in Oxfordshire. Species which are scarce or have outlying populations in the county may show expansion or contraction of their respective ranges. The use of specialist techniques may improve our knowledge of elusive species such as *B.dentata* and *H.brevis*. It would be interesting to know if the ranges of these two species are really mutually exclusive as current records indicate. On present evidence *L. fulvicornis* would appear comparatively scarce in the county. However, this is almost certainly a result of collecting at inappropriate times of year for this autumnal species, so a specific search at this time of year may prove the species to be much more widespread.

Though initially undertaken as a 10km survey, many of the species distribution patterns seen across the county are too subtle to be adequately seen with the relatively coarse 10km recording unit used by the national recording scheme. These patterns are much more apparent from the tetrad (2km X 2km) maps held at the Oxfordshire BRC. A tetrad atlas is in preparation through the County Museum Service using the records held on the OBRC database.

ACKNOWLEDGEMENTS

I am indebted to John Campbell of the Oxfordshire Biological Records Centre for his encouragement, contribution of specimens, access to otherwise inaccessible sites and transport to the far corners of the county, without which this survey would have been substantially less comprehensive.

Thanks are due to Tony Barber for provided much encouragement and assistance with the identification and confirmation of difficult specimens.

I would also like to thank my colleague Mark Stevenson for his help with the complexities of word processing and Robin Buxton for the use of his microscope.

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A KEY TO THE LITHOBIOMORPH CENTIPEDES OF BRITAIN.

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Lithobiomorphs are unmistakable animals, 15 leg pairs (in adult), prominent antennae, frequently quite enlarged 15th leg pair, generally brownish in colour and fast moving. One species, *Lithobius variegatus* tends to remain still on a turned over stone or log, relying on camouflage until disturbed.

Separation of the various species is not always easy and may be difficult if not impossible for most workers in the field. Generally preserved specimens, preferably with all legs intact, must be taken back to the laboratory for examination.

Characters to look for are:

- (a) The number of antennal segments.
- (b) The number of and arrangement of ocelli (simple eyes) on either side of the head capsule. In many cases there is one large eye with several rows of smaller ones.
- (c) The presence or absence of posterior projections on various tergites (dorsal plates). There is, except for tergites 7 and 8 which are both large, an alternation of small (short) and large (more or less equal) tergites. Projections, if present, tend to be on tergites 9, 11, 13 and sometimes on 7.
- (d) The number and arrangement of teeth on the anterior border of the coxosternite, the structure at the base of the poison claws (ventral).
- (e) Females are recognised by a pair of ventral, posterior claws on the last segment. These have two (sometimes more) more or less conical spurs at their base. The structures in males are less distinctive. In certain species (*Lithobius macilentus*, *Lamyctes fulvicornis*) only females are known from Britain.
- (f) The nature of the terminal claw of the last leg. This may be single, double or triple. The accessory claws must not be confused with bristles or spines.
- (g) Various secondary sexual characteristics in males. Only certain species have these which may take the form of projections, swellings, clusters of setae, etc. They are not always easy to see although those of *L. calcaratus* are very distinctive and those of *L. curtipes* are the best way of separating that species from *L. crassipes*.
- (h) The shape of the coxal pores which are found ventrally at the bases of the last four pairs of legs. They may be round, oval, slit shaped or even key hole shaped in some larger animals.
- (i) Colour. Not generally a reliable character but *L. variegatus* ('the striped centipede') is, in life, distinctly rather light coloured and variegated. *L. melanops* is often very light and may appear slightly similar. *L. calcaratus* is almost black, specimens of *L. muticus* and *Lamyctes fulvicornis* may sometimes also be quite dark.
- (j) Spinulation. The legs of *Lithobius* have a series of stout spines at the distal ends of the various leg segments. They are regarded as a valuable diagnostic character but for most purposes there are two important spines:

i) In *L. borealis* there is an additional, diagnostic spine on the prefemur between the usual three ventral and three dorsal ones, a total of 7.

ii) The spine 15 VaC (ventral anterior spine on the coxa of the 15th leg) is useful in separating some species. It is a small, conical spine latero-ventrally and should not be confused with the spine 15 DaC (dorsal) which is latero-dorsal.

Spines which must be distinguished from bristles (or setae) seem daunting to the beginner but the system is basically simple:

V (ventral) or D (dorsal)

a (anterior), m (median) or p (posterior)

C (coxa), t (trochanter), P (prefemur), F (femur) or T (tibia)

in all cases preceded by the leg number, 1-15.

The first and last legs for any particular spine is often the most valuable aspect. However, for most British specimens, the knowledge of the two particular spines mentioned above is usually sufficient.

NB. Very immature animals lack a full complement of legs and, in general, immatures have the various structures mentioned less well developed including ocelli, coxosternite teeth, coxal pores, tergite projections etc.

KEY TO THE GENERA OF BRITISH LITHOBIOMORPHA

1. Only one ocellus on each side, no projections on the tergites, no spines (only thin bristles) on the legs, forcipular coxosternite with 3+3 teeth, always female, claws of last leg triple. Commonly late summer and autumn. Variable in colour from chestnut brown to very dark or greyish.....*Lamycetes fulvicornis* Meinert

2. At least three ocelli on each side, with or without projections on the tergites, at least some spines almost invariably present on at least some legs, forcipular coxosternite with 2+2 up to 6+6 or more teeth, may be male or female, claw of last leg double or single. All times of year, various brownish, blackish or lighter colours.....*Lithobius sp.*

Lithobius is split into sub genera by a number of authors. *Monotarsobius* in which the articulation between the tarsus and metatarsus is fused on legs 1-11 includes *L. crassipes*, *L. curtipes* and *L. microps*. Other British species are in the subgenus *Lithobius*.

KEY TO THE KNOWN BRITISH SPECIES OF *LITHOBIUS*

Lithobius can be conveniently divided into relatively large forms (up to 30 mm or more) with 4 to 7 or more teeth on each forcipular coxosternite: *L. variegatus*, *L. pilicornis*, *L. peregrinus*, and *L. quadridentatus* (sometimes only 3) and the remaining generally smaller species (up to 17 mm or more in *L. melanops* but often less than 15 mm) with 2 (rarely 3) teeth on each side.

1. Forcipular coxosternite with 4 or more teeth on each side (may be fewer in immature animals). Projections on tergites 11 and 13 (may also be present on T9 and possibly on T7). Relatively large animals when mature (20-40 mm).....2
 - Forcipular coxosternite with 2 teeth on each side (rarely 3). Projections on tergites 11 and 13 present or absent. Relatively smaller when mature (up to 17 mm).....8
2. No projections on tergite 9, claw of 15th pair of legs single or with vestigial accessory claw, female gonopods with 2+2 conical spurs. Spine 15 VaC present (also 15VmC ventrally on coxae). Southern and South-Western species but recorded from urban sites elsewhere on a few occasions. May be very large (40 mm).....*Lithobius pilicornis* Newport
 - Projections on tergite 9 conspicuous, claw of 15th legs single or double, female gonopods may have more than 2 spurs on each side. 15 VaC present or absent, 15 VmC absent.....3
3. Claw of 15th legs single, 15 VaC absent. Female gonopod spurs normally 2+2. Common and widespread animals.....4
 - Claw of 15th legs double, 15 VaC present. Female gonopod spurs 2 or more on each side.....5
4. Projections present on tergite 7, coxal pores on last 4 pairs of legs round, very conspicuous variegations on legs in living or freshly killed animal. Widespread and common in much of Britain away from urban areas.....*Lithobius variegatus* Leach
 - No projections on tergite 7, coxal pores oval or slit shaped, no conspicuous variegations, more or less uniform chestnut brown. Very common especially in man influenced habitats.....*Lithobius forficatus* (Linne)
5. VaC present on coxae of 14th legs as well as 15th, female gonopod spurs 2+2. Known from one urban locality in Kent.....*Lithobius peregrinus* Latzel
 - VaC only present on 15th legs, female gonopod spurs 3+3 or 4+4. Woodland etc., S.E. England, rather local.....*Lithobius quadridentatus* Menge (= *piceus*)

6. Three (sometimes 4) ocelli on each side, forcipular coxosternite with 2+2 teeth, claw of last leg usually double, last legs relatively thicker than others, female gonopod spurs rather long and slender. Small (up to 9.5 mm) reddish brown animals with a tendency to curl up when disturbed.....*Lithobius microps* Meinert
- Usually 6 or more ocelli on each side, not as above.....7
7. Antennal articles about 20, no projections on tergites 9, 11 or 13, claw of last legs single. Small (up to 13.5mm) reddish brown species.....8
- Not as above, antennal articles at least 26.....9
8. Up to 13.5 mm long; ocelli 9 to 13 with posterior slightly larger than others which are arranged in 2 or 3 straight rows; forcipular coxosternite without definite shoulders, outer teeth project further forward than inner. No distinctive features to tibia of last legs of male. Very common in much of northern and eastern Britain.....*Lithobius crassipes* L. Koch
- Up to 11 mm; ocelli 6 to 9 with two relatively large posterior ones and others not in definite rows, often in an incomplete rosette; forcipular coxosternite without shoulders and with two closely set teeth projecting to about the same extent. Male has a distinct flattened projection on the postero-lateral extremity of the tibia of the last legs. Scattered records from various parts of England and Wales. Difficult to separate from *L. crassipes* unless males. Curls up when disturbed more readily than that species.....*Lithobius curtipes* C.L. Koch
9. No projections on tergites 9, 11 or 13; antennal articles at least 34. Often rather darkish or black animals, up to 15 mm long.....10
- Projections on at least tergites 11 and 13 or on 13 alone; chestnut brown, light brown, occasionally dark chestnut, up to 17 mm long.....12
10. Double claw on 15th legs; head about as broad as long, little broader than the 3rd tergite; ocelli 2+9 two relatively large posteriorly and rosette of remainder. Males with very distinct posterior-dorsal projection on femur of 15th leg. Animal of moorland, heath and grassland.....*Lithobius calcaratus* C. L. Koch
- Single claw on 15th legs, ocelli with one large then several rows of smaller ones. Males lack the projection on the femur of leg 15. See also *L. lapidicola* where projections on T13 may be more or less absent (double claw on last legs).....11

11. Head markedly broad compared with rest of body especially in male where it is 1.25 times as broad as long; ocelli 10-14, one large, others in 3 or 4 rows. Small, indistinct swelling on dorsal surface of tibia of 14th legs or males. Characteristically as animal of deciduous woodland in S.E. England but sometimes found elsewhere.....*Lithobius muticus* C. L. Koch
- Head not markedly broader than rest of body; ocelli 13-23 with 4 to 6 curved rows. No such swelling on male 14th tibia. Recorded from an urban site in Edinburgh but usually described as an alpine species.....*Lithobius lucifugus* L. Koch
- 12 Claw of 15th legs simple, antennal segments 36-43, ocelli 14-18, up to 14 mm long. Only recent record is from a Welsh coastal site but earlier records from Cornwall and Durham.....*Lithobius tenebrosus* Meinert
- Claw of 15th legs double.....13
- 13 Tergite 9 with distinct, broad projections.....14
- No projections on tergite 9, sometimes only on 13 or poorly developed.....15
- 14 Forcipular coxosternite teeth with median ones projecting further forward than lateral and with no shoulders lateral to teeth. Projections on tergites 9, 11, 13; chestnut brown in colour, up to 14 mm long. Always female. Widespread but scattered.....*Lithobius macilentus* L. Koch
- Median teeth less forward than lateral, more or less distinct shoulders lateral to teeth. Rather broad projections on tergites, 9, 11 and 13 up to 17 mm long. Males and females.....15
- 15 Accessory spine between VpP and DpP on 15th leg. Northern specimens.....*Lithobius borealis* Meinert (in part)
- No such accessory spine.....16
- 16 Females with 2+2 gonopod spurs; spine 15 VaC absent; definite shoulders to forcipular coxosternite. Usually light brown with distinct broad median dark stripe in life. Widespread, often associated with human activity or coastal.....*Lithobius melanops* Newport
- Females with 3+3 gonopod spurs; spine 15 VaC present or absent; no definite shoulders. Variable chestnut brown in colour. Various habitats. South Devon, has occurred in Wales and Isle of Wight.....*Lithobius tricuspis* Meinert
- 17 Tergite 9 without projections (may be developed in northern animals) but present on tergites 11 and 13. Extra posterior spine on prefemur of 15th legs, up to 12.5 mm. Mountains, moorland and lowland sites especially in Western Britain.....*Lithobius borealis* Meinert

17 Tergite 9 without projections (may be developed in northern animals) but present on tergites 11 and 13. Extra posterior spine on prefemur of 15th legs, up to 12.5 mm. Mountains, moorland and lowland sites especially in Western Britain.....*Lithobius borealis* Meinert

- Tergite 9 without projections, may also be absent on tergite 11 and possibly on 13. Shoulders of forcipular coxosternite weakly developed, tergites described as 'wrinkled'. Up to 8 mm. no accessory spine on 15th legs. Kent and Suffolk coasts, glasshouses in Edinburgh.....*Lithobius lapidicola* Meinert

LEGEND FOR TABLE

* Many species normally with 2+2 teeth may sometimes have 2+3 or 3+3 (or very rarely more).

A character in parenthesis indicates that it is not always present

ANT. - Antennal segments

OCEL. - Ocelli

F.C. TEETH - Forcipular coxosternite teeth (1 side)

15th CLAW - Claw of 15th leg

COX. PORES - Coxal pores (R - Round, O - Oval, S - Slit shaped)

TABULAR KEY TO CHARACTERISTICS

SPECIES	SIZE mm	ANT.	OCEL.	FC *	15th CLAW	COX. PORES	TERGITE PROJECTIONS T7 T9 T11 T13	15 VaC	♀ SPURS	CHECK
<i>L. variegatus</i>	24	35-46	13-18	6-7	1	R	* * * *		2	Colour
<i>L. forficatus</i>	30	35-43	20-30	5-7	1	O-S	* * * *		2	
<i>L. peregrinus</i>	24	38-52	11-19	5-7	2	R-S	* * * *	*	2	14 VaC
<i>L. quadridentatus</i>	21	49-54	11-16	3-5	2	R	* * * *	*	3-4	
<i>L. pilicornis</i>	40	29-34	20-40	3-6	1	O-S	* * * *	*	2	
<i>L. melanops</i>	17	32-42	10-13	2	2	R	* * * *		2	
<i>L. tricuspis</i>	14	40-45	10-12	2	2	R	* * * *	(*)	3	
<i>L. borealis</i>	12.5	28-34	8-12	2	2	R	(*) * * *		2	15th Leg
<i>L. lapidicola</i>	8	26-34	10-11	2	2	R	(*) * * *		2	
<i>L. macilentus</i>	14	39-45	7-9	2	2	R	* * * *		2	For. Cox.
<i>L. tenebrosus</i>	14	36-43	14-18	2	1	R	* * * *		2	
<i>L. calcaratus</i>	15	39-50	7-9	2	2	R			2	♂ 15th Leg
<i>L. muticus</i>	15	34-43	10-14	2	1	R			2	♂ 14th Leg
<i>L. lucifugus</i>	17	33-50	13-23	2(-4)	1	R			2	
<i>L. crassipes</i>	13.5	20	9-13	2	1	R			2	
<i>L. curtipes</i>	11	20	6-9	2	1	R			2	♂ 14th Leg
<i>L. microps</i>	9.5	23-27	3(-4)	2	1(2)	R			2	
<i>L. fulvicornis</i>	10.5	25	1	3	3	R			2	No spines

THE LATIN NAMES OF BRITISH MILLIPEDES.

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INTRODUCTION

Firstly I must say that I cannot take all the credit for this article. It is based on a series of articles in the British Arachnological Society Newsletter (1980-1981) by John Parker under the title 'What's in a name?' on the derivations of the scientific names of spiders. This has recently been updated and extended in the B.A.S. Members Handbook (1993). I do not intend to delve into the complexities of scientific nomenclature - if you are interested, there are a number of publications on the subject, not least John Parker's original articles.

This is by no means comprehensive, and much has been gleaned from Latin and Greek dictionaries, I do not have the time or availability to access the original descriptions of the species - where the derivation of the name is often also explained. Many scientific names are open to personal interpretation, and I am indebted to Helen Read and her colleagues in the B.M.G. for their critical corrections and additional derivations included in this list. However, there are still a few missing - any suggestions will be greatly appreciated.

KEY

Many of the names come from the Latin from which numerous common English words are derived. In some cases, the species name is the exact spelling of the Latin word, thus to avoid repetition the Latin word is omitted. Some specific names are used for more than one species, often with different endings (dependent on the gender of the generic name e.g. *armatum* or *armatus*) - rather than including two entries, these different versions are denoted as follows - *armat/um* - *us*. Some names have more than one possible derivation, in these cases two entries are included.

OMISSIONS

Unfortunately it has proved impossible to derive all the millipedes' names fully. There was one name with no derivation whatsoever, which has been omitted, this is *Stosatea*.

ABBREVIATIONS

GK	- Greek	L	- Latin	N.L.	- New Latin	M.E.	- Middle English
Met.	- Metonym	Myth.	- Mythological	Pat.	- Patronym	Obs.	- Obscure meaning

For Greek derivations I have included the original Greek spelling, therefore there follows a quick listing of the approximate transliterations of the Greek letters: α-a, β-b, γ-g, δ-d, ε-e, ζ-z, η-e, θ-th, ι-i, κ-k (or hard c), λ-l, μ-m, ν-n, ξ-x, ο-o, π-p, ρ-r, σ or ς-s, τ-t, υ-u or y, φ-f or ph, χ-ch, ψ-ps, ω-o

Adenomeris (GK: αδενος) a gland; (GK: μερις) part or portion
albipes (L: *albus*) white; (L: *pes*) a foot
albonanus (L: *albus*) white; (GK: νανος) a dwarf
angustus (L) narrow
Archiboreoiulus (GK: αρχη) beginning or first; (from *Boreoiulus*) q.v.
armatum -us (L) equipped or armed
bagnalli after R.S. Bagnall (Pat.)
belgicus (L: *Belgia*) from Belgium
Blaniulus (GK: βλανος) blind; (from *Iulus*) q.v.
boncii after Bonc (Pat.)
Boreoiulus (GK: βορειος) the north, northern; (from *Iulus*) q.v.
Brachychaeteuma (GK: βραχυς) short; (GK: χαιτη) a mane; (GK: υμην) skin
Brachydesmus (GK: βραχυς) short; (GK: δεσμος) a band or halter
Brachyiulus (GK: βραχυς) short; (from *Iulus*) q.v.
bradeae after H.K. Brade-Birks (Pat.)
britannicus (L: *Britannia*) from Britain
caeruleocinctus (L: *caeruleus*) blue; (L: *cinctus*) a girding or covering
Choneiulus (GK: χονη) a crucible or funnel; (from *Iulus*) q.v. : referring to the shape of the gonopods
Chordeuma (GK: χορδη) cord or string; (GK: υμην) skin
Chordeumella (from *Chordeuma*) q.v.; (L: *-ella*) diminutive : a small *Chordeuma*
complanatus (L) flattened out
coriaceus (L) leathery
Craspedosoma (GK: κρασπεδον) edge or border; (GK: σωμα) the body
crinata (L: *crinis*) hair; (L: *-atus*) bearing
Cylindroiulus (GK: κυλινδρος) a cylinder; (from *Iulus*) q.v.
denticulata -um -us (L: *dentatus*) toothed; (L: *-atus*) bearing : with small teeth
digitata -us (L: *digitus*) a finger; (L: *-atus*) bearing
Diploiulus (GK: διπλος) double; (from *Iulus*) q.v.
DIPLOPODA [Class] (GK: διπλος) double; (GK: ποδι) the foot : referring to two legs per segment
Enantiulus (GK: εναντιος) opposite; (from *Iulus*) q.v.
Entothalassinum (GK: εντος) within; (GK: θαλασσα) the sea
Eumastigonodesmus (GK: ευ-) well-developed; (GK: μαστιγιον) a whip; (GK: δεσμος) a band or halter

fallax (L) deceptive
foetidus (L) stinking
Fontaria (L: *fons*) a spring (of water); (L: *-arium*) from
frisius (L) from Norderney, one of the Frisian Islands
fuscus (L) dark (brown)
gallicum -us -a (L) from Gaul (now France)
Geoglomeris (GK: γεως) the Earth; (from *Glomeris*) q.v.
germanicum (L: *Germania*) from Germany
Gervaisia after Gervais (Pat.)
gibbosa -us (L: *gibbus*) a hump : referring to the male carapace
Glomeris (L: *glomero*) to form into a ball
gracilis (L) thin or slender
guttulatus (L: *guttula*) a small drop; (L: *-atus*) bearing : referring to the prominent ozadenes
HELMINTHOMORPHA [Sub-class] (GK: ελμινς) a worm; (GK: μορφη) form or shape
Jacksoneuma after A.R. Jackson (1877-1944)
ignoratus (L: *ignoro*) not to know, ignorant
inconstans (L) changeable
Isobates (GK: ισος) equal to; (GK: βατης) one who walks
italica -um (L: *Italicus*) from Italy
Iulus (L) the son of Ascanius
Julus (L: *Iulus*) the son of Aacanius
jurassica -um (L: *Jura*) from Jura, France/Switzerland
kervillei after Kerville (Pat.)
kochli -ii after C.L. Koch (1778-1851); or L.C.C. Koch (1825-1908) (Pat.)
lagur'a -us (GK: λαγος) a hare : furry like a hare (Met.)
latestriatus (L: *latus*) broad; (L: *striatus*) scalloped, striped
Leptoiulus (GK: λεπτος) thin; (from *Iulus*) q.v.
Leptophyllum (GK: λεπτος) thin; (GK: φυλλον) a leaf
littoralis (L) of the sea-shore
lobata (L: *lobatus*) lobed
londinensis (L: *Londinum*) from London
Macrosternodesmus (GK: μακρος) large; (GK: στερνο) the sternum; (GK: δεσμος) a band or halter : referring to the unusually long sterna
melanops (GK: μελας) black; (GK: οψις) appearance
Melogona (GK: μελας) black; (GK: γονος) sperm : referring to the black spermatophore

- Mesoiulus* (GK: μεσος) in the middle; (from *Iulus*) q.v.
- Metaiulus* (GK: μετα) changed; (from *Iulus*) q.v.
- Microchordeuma* (GK: μικρος) small; (from *Chordeuma*) q.v.
- Monacobates* (L) from Monaco; (GK: βατης) one who walks: location of the type-species
- MYRIAPODA** (GK: μυριοι) numberless; (GK: ποδι) the foot: many-legged
- Nanogona* (GK: νανο) dwarf; (GK: γονος) sperm
- Nemasoma* (GK: νημα) a thread; (GK: σωμα) the body
- niger* (L) black or dark
- nitidus* (L) shining
- Nopoiulus* (GK: νωψ) "one who looks stupid"; (from *Iulus*) q.v.: according to the description by Menge
- Ommatoiulus* (GK: ομμα) an eye; (from *Iulus*) q.v.
- Oniscus* (GK: ονισκος) a woodlouse
- Ophiodesmus* (GK: οφης) a snake; (GK: δεσμος) a band or halter
- Ophiulus* (GK: οφης) a snake; (from *Iulus*) q.v.
- Orthomorpha* (GK: ορθος) straight; (GK: μορφη) form or shape
- owenii* after Owen (Pat.)
- Oxidus* (GK: οξυς) sharp: referring to the sharp keels
- palicola* (L: *pala*) a spade; (L: *colo*) inhabit: i.e. living in the soil
- pallidum -us* (L) pale
- palmatum* (L) hand-shaped
- panporus* (GK: παν) everything; (GK: πορος) an opening, pore: with pores all over
- Paradesmus* (GK: παρα) near; (GK: δεσμος) a band or halter
- parisiorum* (L: *Parisii*) from Paris, France
- PENICILLATA** [Sub-class] (L: *penicillus*) a painter's brush; (L: *-atus*) bearing
- PENTAZONIA** [Sub-class] (GK: πεντη) five; (GK: ζωνη) a belt or girdle
- pilosus* (L) hairy
- polydesmoides* (from *Polydesmus*) q.v.; (GK: -οιδες) like: similar to *Polydesmus*
- Polydesmus* (GK: πολυ) many; (GK: δεσμος) a band or halter
- Polymicrodon* (GK: πολυ) many; (GK: μικρος) small; (GK: δοντι) a tooth
- Polyxenus* (GK: πολυ) many or very; (GK: ξενος) a stranger: a very strange animal!
- Polyzonium* (GK: πολυ) many; (GK: ζωνη) a belt or girdle
- Poratia* (L) after Porat (Pat.)
- pratensis -is* (L) growing in meadows: from meadows
- Prosopodesmus* (GK: προσοψις) front view; (GK: δεσμος) a band or halter
- Proteroiulus* (GK: προτερος) earlier; (from *Iulus*) q.v.
- proxima -um* (L: *proximus*) nearest: to another species?
- punctatum -us* (L: *punctum*) a spot; (L: *-atus*) bearing: referring to the ozadenes
- pusilla -us* (L: *pusillus*) very little
- rawlini* after Rawlins (Pat.)
- sabulosum -us* (L) sandy
- scandinavus* (L: *Scandinavia*) from Scandinavia
- Schizophyllum* (GK: σχιζω) to split; (GK: φυλλον) a leaf
- Scolopendra* (GK: σκολοπενδρα) a millipede
- scutellare* (L: *scutulum*) a small shield
- silvarum* (L: *silva*) a wood: of woods
- Strongylosoma* (GK: στρογγυλος) round; (GK: σωμα) the body
- Stygioglomeris* (GK: Στυγια) the Stygian witches, three blind wise women; (from *Glomeris*) q.v.: referring to its lack of eyes (Myth.)
- superus* (L) higher
- sylvestre* (L: *silvestris*) living in woods
- Tachypodoiulus* (GK: ταχυς) quick; (GK: ποδι) a foot: a fast runner (relatively speaking)
- tenuis* (L) thin; fine or slender
- testaceus* (L) brick-red
- teutonicus* (GK: τευτων) the Teutons, a Germanic people
- Thalassisobates* (GK: θαλασσα) the sea; (from *Isobates*) q.v.: a coastal *Isobates*
- Titanosoma* (L: *Titan*) a giant; (GK: σωμα) the body (Myth.)
- Trachysphaera* (GK: τραχυς) rough or shaggy; (GK: σφαира) a ball or globe
- truncorum* (L: *truncus*) a tree trunk: probably referring to its habitat
- Unciger* (L: *uncus*) a hook; (L: *-ger*) to bear
- varicornis -is* (L: *varius*) mottled; (L: *cornus*) a horn
- vulnerarius* (L: *vulnero*) wound; (L: *-arius*) possessing: possibly referring to its lack of eyes

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COLIN PETER FAIRHURST (1942-1994): BIBLIOGRAPHY OF WORKS ON MYRIAPODA.

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At the time of his death in December 1994, Colin Fairhurst (see Obituary in *Bulletin of the British Myriapod Group* 11, 1995) had produced 14 titles relating to myriapods, including his Ph.D. thesis and an unpublished but widely circulated summary of millipede records. Four titles are derived mainly from the research carried out for his Ph.D., nine are concerned with the Myriapod Survey and Millipede Recording Scheme and one, on poisonous exudates, is a review of a topic in which he had a continuing interest. Six papers were published in the proceedings of successive International Congresses of Myriapodology.

By running the Millipede Recording Scheme from 1971 to 1983, and identifying many thousands of specimens for others, Colin made a most important contribution to another publication, the Preliminary Atlas (British Myriapod Group, 1988, *Preliminary atlas of the millipedes of the British Isles*. Huntingdon, Biological Records Centre).

I have been unable to trace evidence for a book chapter on *The life cycles of Myriapoda* referenced as being 'in press' in one of his personal papers from 1993, and the publishers listed in the reference have no knowledge of the book (*The reproductive biology of the Arthropoda*) in which it is listed as being in press. I should be pleased to hear if anyone comes across this chapter or book.

Off prints of some of these papers (marked *) are available from me on request: a large stamped self-addressed envelope would be appreciated with any request.

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BOOK REVIEW:

MILLIPEDES, CENTIPEDES AND WOODLICE OF THE SHEFFIELD AREA

by Paul Richards

Sorby Natural History Society, Sheffield City Museum. 91 pages. (Available from City Museum, Weston Park, Sheffield, S10 2TP. £5.43 including p+p).

Occasionally local museums and natural history societies produce guides or lists of myriapods from their area. This is a much more ambitious publication and, by the nature of its content, has a much wider relevance than to just the area of the Sorby Natural History Society; they are to be very much commended on it.

After a general introduction to taxonomy, habitat, collecting techniques, preservation and identification and recording, the book goes on to deal with each of the three groups named in turn with an introduction to the group, a key and reports and 1km grid square maps of each species. Of particular interest are the keys which include sketch drawings and although of limited value to 'southerners' because of the species not included they are usefully comprehensive for anyone working in the English Midlands northward. Several 'southern' species have crept in by being found much further north than expected such as *Lithobius muticus* and *L. pilicornis*.

There are a number of useful drawings in the text as well as in the keys, eight colour photographs (plus two on the covers) and black and white (presumably scanning electron micrographs) of several more to show particular features. Some 33 millipedes, 21 centipedes and 15 woodlice are described from the area with a comment that centipedes are probably under recorded. Hopefully this book will encourage someone to work on them. There are also comments on conservation and management and a useful set of references as well as British Myriapod Group and British Isopod Study Group contact addresses.

English names are introduced for some species. Some are familiar such as the bristly millipede and pill millipede, and the use of the name 'striped centipede' for *Lithobius variegatus* is very reasonable but, on a personal level, I feel uneasy about the 'club tailed snake millipede'. It would not be appropriate for me to comment on the woodlouse names. Certainly there is said to be a barrier to popularisation compared with, say, Lepidoptera by the use of Latin binomials all the time and perhaps we should be addressing it but how far should we go? R.F. Lawrence in his Centipedes and Millipedes of Southern Africa uses English names for groups - Geophilomorpha (Earth centipedes, Scutigleromorpha (House or shield centipedes) etc. and we do indeed refer to *Blaniulus guttulatus* as the 'spotted snake millipede'.

There are undoubtedly likely to be things in the book which we might not all concur with but I have not found much so far. Recommended reading and as an attempt to popularise 'our' animals the author is to be congratulated.

A.D. Barber

**BOOK REVIEW:
AN ATLAS OF OXFORDSHIRE MYRIAPODA: DIPLOPODA &
CHILOPODA.**

S.J. Gregory & J.M. Cambell.

Occasional Paper No. 19.

Biological Record Centre, Oxfordshire Museums Store, Witney Road, Standlake,
Oxon. OX8 7QG.

Most of this publication consists of species maps of each millipede and centipede found in Oxfordshire (VC22 & VC23). These have been published in the Bulletin last year and in the present volume but the maps in the occasional publication in addition to having updated millipede records, are at tetrad level and thus are more detailed. The introduction includes a section on the Myriapoda and an historical review of recording in Oxfordshire. Then follows a section on habitat associations which lists the major habitat types in the county and the species found in them. This is concluded by two tables indicating habitat preferences. The species maps are introduced by more general ones showing the distribution of calcareous rocks and woodlands and a coverage map.

The distributions are shown for 38 millipedes and 28 centipedes which have so far been recorded for Oxfordshire together with a brief commentary. Although some species are represented by few records the senior author's ability to find small beasts has ensured that even for those easily overlooked there is the feeling that the distributions are not solely a function of where someone has looked.

It would be good to see reports like this for each of our counties eventually and the authors are to be commended on their hard work both in the field and in producing this report.

Copies are available for about £2 (+60p P+P) from S.J. Gregory, The Northmoor Trust, Little Wittenham Nature Reserve, Little Wittenham, Abingdon, Oxon. (Tel: 01865 407 792) or from J.M. Cambell, Oxfordshire Biological Records Office.

H.J. Read