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Occasional Paper No. 19

AN ATLAS OF OXFORDSHIRE MYRIAPODA: DIPLOPODA (Millipedes) and CHILOPODA (Centipedes)

S.J.Gregory, Northmoor Trust and J.M.Campbell, Oxon BRC

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CONTENTS

	Polydesmus inconstans	25
	Polydesmus testaceus	24
	Polyxenus lagurus	10
	Proteroiulus fuscus	14
	Stygioglomeris crinita	11
	Tachypodoiulus niger	18
Centipedes:	*Brachygeophilus truncorum*	35
	Brachyschendyla dentata	30
	Clinopodes linearis	32
	Cryptops anomalans	35
	Cryptops hortensis	36
	Cryptops parisi	36
	Geophilus carpophagus	32
	Geophilus electricus	33
	Geophilus oligopus (insculptus)	34
	Geophilus osqidatum	33
	Haplophilus subterraneus	29
	Henia brevis	30
	Lamyctes fulvicornis	42
	Lithobius borealis	39
	Lithobius calcaratus	40
	Lithobius crassipes	41
	Lithobius curtipes	41
	Lithobius forficatus	37
	Lithobius macilentus	38
	Lithobius melanops	38
	Lithobius microps	42
	Lithobius muticus	40
	Lithobius pilicornis	39
	Lithobius variegatus	37
	Necrophloeophagus flavus	34
	Schendyla nemorensis	29
	Strigamia acuminata	31
	Strigamia crassipes	31

INTRODUCTION

The Myriapoda are an informal grouping of four Arthropod classes all bearing many (i.e. more than four) pairs of legs. They are closely allied to the insects (class Hexapoda), with which they are thought to share a common ancestor. This atlas deals with the two best known classes, the millipedes (Diplopoda) and the centipedes (Chilopoda). The lesser known Pauropoda and Symphyla are not considered.

Millipedes are mostly detritivores, feeding on partially decayed vegetation or dead wood, and play an important, but largely unappreciated, role in recycling nutrients back into the soil. Five of the six British orders occur in Oxfordshire. The bulk of the county fauna is composed of the Julida and the Polydesmida. The Julida (19 species) are the familiar snake millipedes with cylindrical bodies and around 30 to 60 pairs of legs depending on the species. Several species, such as the ubiquitous *Tachypodoiulus niger,* are commonly encountered in gardens. The Polydesmida (9 spp.) are the flat-back millipedes, so named because they have well developed lateral keels making the body appear flattened. They are relatively short and stout and usually have 20 leg pairs. The Chordeumatida (5 spp.), with 28 or 30 leg pairs, are a more typical cylindrical millipede shape. This order is unusual since adults are only found during the winter months. The picture is completed by the Glomerida, with two broad dumpy species capable of rolling into a ball, and the Polyxenida which is represented by the bristly millipede (*Polyxenus lagurus*). With just 13 pairs of legs this looks more like a beetle larvae than a millipede.

Centipedes are carnivorous and prey on a wide variety of other invertebrates. All three of the British orders are represented in Oxfordshire. The Geophilomorpha (13 spp.) are blind and essentially subterranean in habit. They are often called wire centipedes because of their elongate and flexible bodies which, depending upon the species, bear between 37 and 101 leg pairs. The Lithobiomorpha (12 spp.) are fast moving centipedes usually hunting on the ground surface. They have short stout bodies bearing 15 pairs of legs and include the familiar *Lithobius forficatus*. The Scolopendromorpha (3 spp.) are somewhat intermediate between these two orders. They are also fast moving hunters and have 21 pairs of legs.

RECORDING: PAST AND PRESENT

Nothing appears to be known of the Oxfordshire Myriapoda until the 1930's. Fieldwork undertaken by the Bureau of Animal Population Studies, based at Oxford University, generated many species records (the 'Wytham Survey'). The earliest records are from Bagley Wood, near Oxford, in 1933 when the millipede *Glomeris marginata* and the centipedes *Lithobius borealis* and *L. crassipes* were collected. Further collections were made, mainly from Wytham Woods near Oxford, from the 1940's to the 1960's. Amongst the highlights of the Survey were the collection, in 1950, of *Stygioglomeris crinita,* a species new to Britain, and of *Lithobius muticus,* a species previously known from just three British sites. Other species of note, recorded in this period, include the millipedes *Polyxenus lagurus* and *Julus scandinavius* and the centipedes *Lithobius macilentus, L. calcaratus* and *L. curtipes.*

There was little further recording in the county until the late 1980's. Dr S.P.Hopkin made several excursions into the county to collect various invertebrate taxa, including the millipedes *Ommatoiulus sabulosus* and *Ophiodesmus albonanus.* Dr D.T.Bilton did much collecting from Oxford city where he found many scarce synanthropic species including

the millipedes *Nopoiulus kochii* and *Cylindroiulus vulnerarius* and the centipedes *Brachyschendyla dentata, Clinopodes linearis* and *Cryptops anomalans*.

Since 1989 the authors have put much effort into filling in the gaps for the common species and defining the ranges of the more local ones. Species records have been made in accordance with guidelines given by the British Myriapod Group. As many habitats as possible were sampled throughout the county. These included not only semi-natural sites, such as woodland, grassland, meadow and fen, but also man-made (synanthropic) sites, such as old churchyards that hold there own unique, but little studied, fauna. Several additional species, including the millipedes *Chordeuma proximum* and *Polydesmus testaceus* and the centipedes *Henia brevis, Geophilus osquidatum* and *Lithobius pilicornis,* have been added to the county list.

OXFORDSHIRE BIOLOGICAL RECORDS CENTRE

The Oxfordshire Biological Records Centre (O.B.R.C.) was set up in 1976 by the County Council Department of Museum Services and co-ordinates biological recording within the current administrative county of Oxfordshire. This was created during the local government reorganisation of 1974 by the amalgamation of 'old' Oxfordshire (vice-county 23) with the north-west part of Berkshire (vc. 22).

The uses of the O.B.R.C. are manifold and include planning, conservation, education and research. Details about the O.B.R.C. and an annual newsletter are available to recorders, and potential recorders, at the following address:

Oxon County Museums Store,
Witney Road,
Standlake,
Oxon,
OX8 7QG

Full details of all records are held by the O.B.R.C. on a computerised database (using RECORDER). Records are site based and to the end of December 1995 these amount to over 6000 millipede and centipede records. The majority of these records are post 1990 and mainly attributable to the authors. The collection of data is on going.

HABITAT ASSOCIATIONS

Many species of millipede and centipede seem to be quite tolerant of a wide range of habitat conditions and some readily colonise disturbed (synanthropic) sites such as gardens, churchyards and waste ground. Others are more specialised and restricted to undisturbed semi-natural habitats. A few scarce species seem to be restricted to synanthropic sites, such as old churchyards, and are probably accidental introductions into Britain. Habitat preferences of Oxfordshire species are listed, in Tables 1 and 2 below, for a range of habitat types found throughout the county.

Semi-Natural Habitats

Deciduous Woodlands: This has proved to be by far the most diverse of the semi-natural habitats with 27 millipede and 20 centipede species collected. Characteristic species include the millipedes *Glomeris marginata, Proteroiulus fuscus, Cylindroiulus punctatus* and *Polydesmus denticulatus,* and of the centipedes, both *Strigamia* species, *Brachygeophilus truncorum, Lithobius crassipes* and *L. variegatus.*

Ancient deciduous woodland is an important habitat for several scarce species, especially Lithobiid centipedes *such as Lithobius curtipes, L. macilentus* and *L. muticus.* On calcareous soils the elusive millipedes *Stygioglomeris crinita* and *Brachychaeteuma bradeae* can be found. Where acidic soils occur the millipedes *Chordeuma proximum* and *Julus scandinavius* and the centipede *Lithobius borealis* have been collected.

Heathland: There is very little heathland present within the county. The acidic conditions proved poor for millipedes (13 species recorded) but generally better for centipedes (15 species). None-the-less this habitat supported a characteristic Myriapod fauna, typified by the millipedes *Ommatoiulus sabulosus* and *Cylindroiulus latestriatus,* and the centipedes *Geophilus carpophagus* and *Lithobius calcaratus.*

Calcareous grasslands: In the lime-rich conditions 19 species of millipedes have been recorded, though only a few, such as *Boreoiulus tenuis* and *Cylindroiulus caeruleocinctus,* can be said to be characteristic of such habitats. Centipedes, with 14 species collected, are poorly represented. Short turf calcareous grassland is an important habitat in the county for two species, the rare millipede *Polydesmus testaceus* and the centipede *Lithobius calcaratus.*

Riverside Meadows: 20 millipede and 14 centipede species were recorded. The common millipede *Brachyiulus pusillus,* and the more local *Brachychaeteuma melanops* and *Polydesmus inconstans,* and the centipede *Lamyctes fulvicornis,* are strongly associated with damp river-side meadows in the county. Riverside willow pollards support a distinctive sub-cortical community, where the millipedes *Polyxenus lagurus* and *Cylindroiulus britannicus,* and the centipede *Lithobius melanops,* can be numerous.

Man-Made (Synanthropic) Habitats

Churchyards and gardens:. Many churchyards and some gardens are very old, with a long period of introduction for many species, and a wide range of micro-sites for occupation. Consequently this habitat has proved as diverse as semi-natural woodland with 27 millipede and 20 centipede species recorded. Some seem to be unique to such sites and are probably ancient introductions beyond their natural ranges. Piles of stone and rubble may harbour elusive species, such as the millipedes *Archiboreoiulus pallidus, Nopoiulus kochii, Cylindroiulus vulnerarius, Macrosternodesmus palicola* and Ophiodesmus *albonanus,* and centipedes such as *Brachyschendyla dentata, Henia brevis, Clinopodes linearis* and *Geophilus osquidatum.*

Table 1: HABITAT PREFERENCES OF OXFORDSHIRE MILLIPEDES

MILLIPEDES:	HABITATS Wood	Heath	Grass	River	Church	Arable	Waste
Polyxenus lagurus	++		+	+++	++		
Glomeris marginata	+++	++	++		+		
Stygioglomeris crinita	+++						
Nanogona polydesmoides	+++		++	+	+++		+
Brachychaeteuma melanops				+++	+++		
Brachychaeteuma bradeae	+++						
Chordeuma proximum	+++						
Melogona scutellare	+++		+	+	+		
Nemasoma varicorne	+++	++		+++	+		
Proteroiulus fuscus	+++	++		+++	++		
Choneiulus palmatus					+++		+++
Nopoiulus kochii					+++		+++
Blaniulus guttulatus	+		+	+	+++	++	+++
Archiboreoiulus pallidus	+		++	++	+++		
Boreoiulus tenuis	++		+++	+	+++		
Ommatoiulus sabulosus	+++					++	
Tachypodoiulus niger	+++	++	++	++	+++	++	+++
Allajulus nitidus	+++						
Cylindroiulus caeruleocinctus	+		+++	+	+++		+
Cylindroiulus vulnerarius					+++		
Cylindroiulus punctatus	+++	++	+	+++	++	++	+
Cylindroiulus latestriatus		+++			++		
Cylindroiulus britannicus	++			+++	++		+
Cylindroiulus parisiorum	+++				++		
Cylindroiulus truncorum					+++		
Julus scandinavius	+++	++					
Ophyiulus pilosus	+++	++	++	+++	+++	++	++
Brachyiulus pusillus	+			+++	++	++	+
Polydesmus angustus	+++	+++	+++			+	
Polydesmus testaceus			+++				
Polydesmus inconstans			++	+++		+	
Polydesmus gallicus	+++	+	++	+++	+++	++	+++
Polydesmus denticulatus	+++	+				+	
Brachydesmus superus	+++	++	++	+++	+++	++	++
Macrosternodesmus palicola	++		++	+	+++		+
Ophiodesmus albonanus	++		+		+++		
Oxidus gracilis					+++*		

KEY TO TABLES

Habitats: Wood - deciduous woodland; **Heath** - acidic grassland or heathland; **Grass** - calcareous grassland; **River -** damp riverside meadows and wetland; **Church -** churchyards and gardens (*heated greenhouse only); **Arable -** arable field; **Waste -** waste-ground.

Habitat preference is indicated as follows:

+++ **-** a strong habitat preference
++ **-** a frequent occurrence
\+ **-** a unusual record from that habitat.

Table 2: HABITAT PREFERENCES OF OXFORDSHIRE CENTIPEDES

CENTIPEDES	HABITATS Wood	Heath	Grass	River	Church	Arable	Waste
Haplophilus subterraneus	+		+	+	+++		++
Schendyla nemorensis	++	+	+++	++	+++	++	++
Brachyschendyla dentata					+++		
Henia brevis					+++		
Strigamia crassipes	+++	+		+++			
Strigamia acuminata	+++	++		++			
Clinopodes linearis					+++		
Geophilus carpophagus 'rural'	+++	+++					
Geophilus carpophagus 'urban'					+++		
Geophilus electricus	++		+		+++		
Geophilus osquidatum				+	+++		
Geophilus oligopus	++	++	+	+	+++		++
Necrophloeophagus flavus	++	+	++	+++	+++	++	+++
Brachygeophilus truncorum	+++	+++	+	++	+		
Cryptops anomalans					+++		++
Cryptops hortensis	++	+	+	+	+++		+
Cryptops parisi	+				+++		
Lithobius variegatus	+++	+++	+		+		
Lithobius forficatus	+++	++	++	++	+++	++	+++
Lithobius melanops	++	+	+	+++	+++	+	++
Lithobius macilentus	+++						
Lithobius borealis	+++	+					
Lithobius pilicornis					+++		
Lithobius calcaratus		+++	+++				
Lithobius muticus	+++		+				
Lithobius crassipes	+++	++	+	+	+	+	
Lithobius curtipes	+++						
Lithobius microps	++	+	++	+++	+++	++	+++
Lamyctes fulvicornis				+++		++	+

Three large centipedes, *Cryptops parisi, C. anomalans* and *Lithobius pilicornis* have been found under large stones. On walls *Polyxenus lagurus* can be numerous. Compost heaps support many species, including the millipedes *Melogona scutellare* and *Choneiulus palmatus*. Loose bark on trees often conceals the large urban form of *Geophilus carpophagus*. Two introduced species, *Cylindroiulus truncorum* and *Oxidus gracilis,* have been collected from the Botanic Gardens in Oxford and may have become established elsewhere in the county.

Arable: Few collections have been made from arable fields. The 10 millipede and 8 centipede species recorded are mainly ubiquitous. Though these were mostly collected from the field margins a few species, such as the millipede *Brachyiulus pusillus* and the centipede *Lamyctes fulvicornis,* have been recorded deep within the crop.

Waste ground: Waste ground, such as railway sidings, working quarries and derelict areas, is typically dry, exposed and sparsely vegetated. In these harsh conditions just 14 millipede and 10 centipede species were found. However four scarce species, the millipedes *Choneiulus palmatus, Nopoiulus kochii* and *Ommatoiulus sabulosus* and the large centipede *Cryptops anomalans* were found.

ACKNOWLEDGEMENTS

Thanks are due to Dick Jones and Tony Barber, of the British Myriapod Group, for their prompt confirmation and identification of difficult or unusual specimens.

Mr Charles Elton kindly made the data in the Wytham Survey available for inclusion in this atlas. A number of collectors have generously made their records for the county available, notably Drs Steve Hopkin, David Bilton and K.N.A.Alexander.

Thanks are also due to Mark Stevenson for advice and assistance with the subtleties of word processing.

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Gregory, S.J. (1995) *Oxfordshire Millipedes.* Bulletin of the British Myriapod Group, **11:** 7-26

Gregory, S.J. (1996) *Oxfordshire Centipedes.* Bulletin of the British Myriapod Group, **12:**

INTRODUCTION TO THE MAPS

The species maps have been produced from the computerised data-base held at the O.B.R.C. using DMAP mapping software.

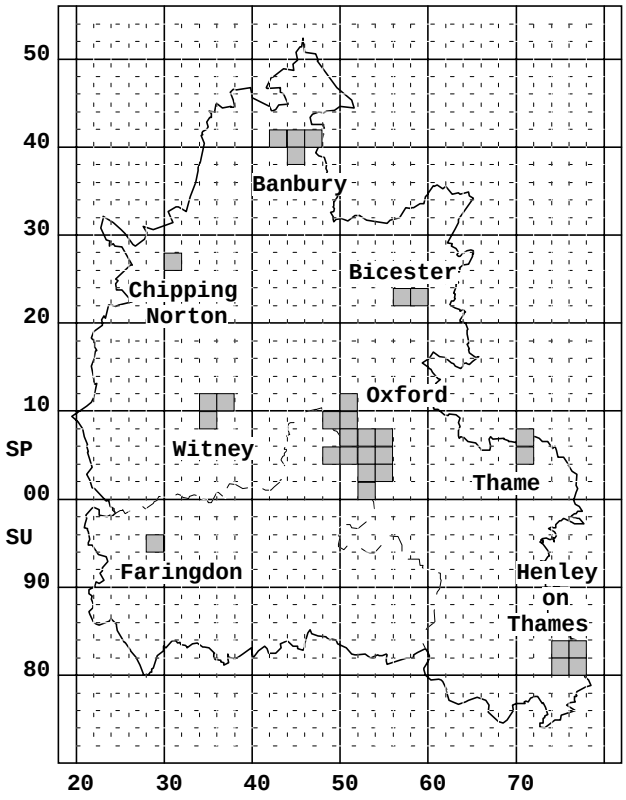
Species records are site based but the maps indicate the occurrence of a given species within tetrads. Tetrads are 2km by 2km areas defined by the even numbered national grid lines shown on Ordnance Survey maps. The 10km grid squares are shown as numbered solid lines with the tetrads between. Also shown is the course of the River Thames, which is the pre-1974 county boundary between Oxfordshire (vc.23) and Berkshire (vc.22).

The species maps are shown with records falling into two time categories. Only the most recent record for a given tetrad is shown.

Pre-1980 records are shown by open circles (**O**)
Post 1980 records (mostly post 1990) are shown as solid dots (●).

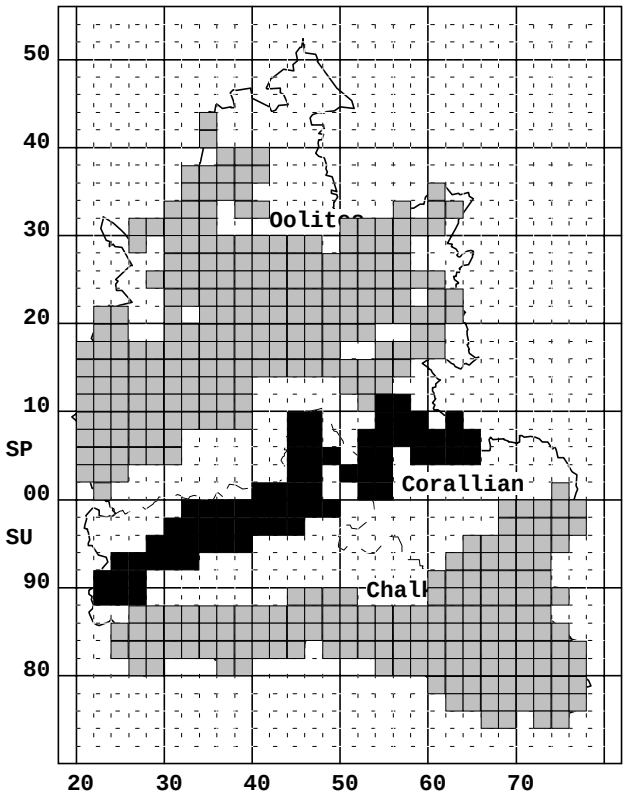
Species names follow those used in Blower (1985) and Barber & Keay (1988), unless noted. The presence of each species within the two vice-counties is indicated above the species account. Nationally Notable species (i.e. those occurring in less than 100 10km grid squares throughout the British Isles) are also noted.

MAIN TOWNS



As an aid to orientation the location of several towns and the city of Oxford are shown. In most cases the towns do not completely cover the tetrads in which they are shown to occur.

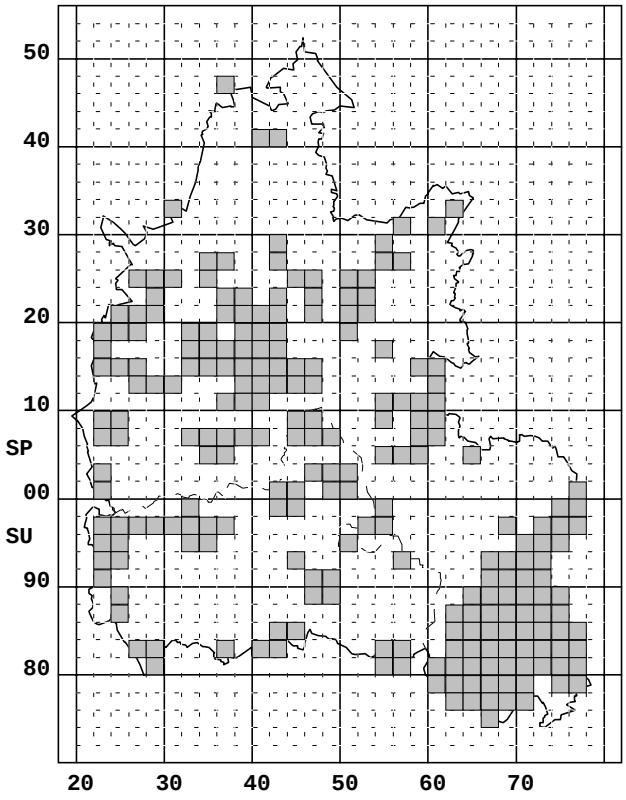
CALCAREOUS ROCKS



The occurrence of underlying calcareous bed-rock is indicated. In parts these rocks may be locally masked by clay drift of more recent origin.

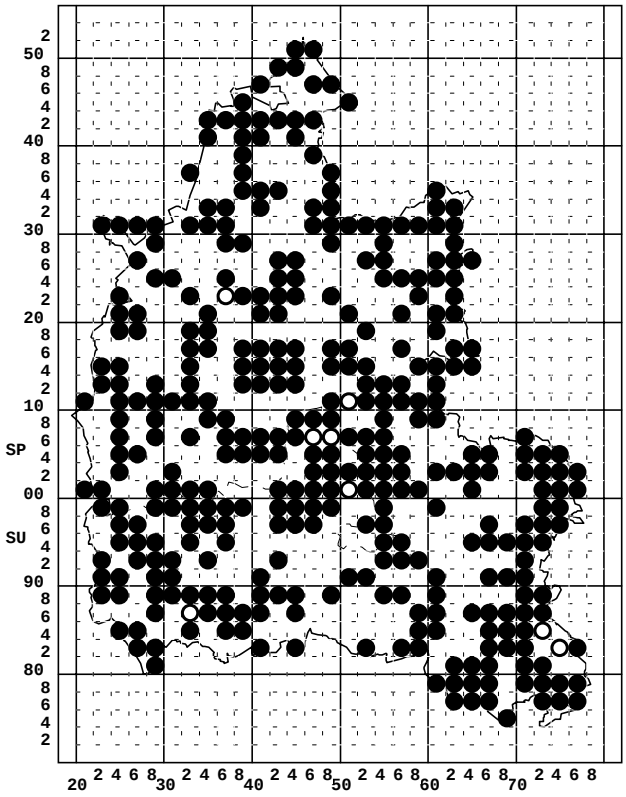
In the remaining tetrads outcrops of clay occur: Lower Lias in the north, then a band of Oxford clay, with Gault and Kimmeridge clays forming the southern-most band.

WOODLANDS



All tetrads containing one or more woodlands of more than 1/8 of a square kilometer in area are shown. The type and quality of the woodland varies considerably from conifer plantation to blocks of ancient deciduous forest.

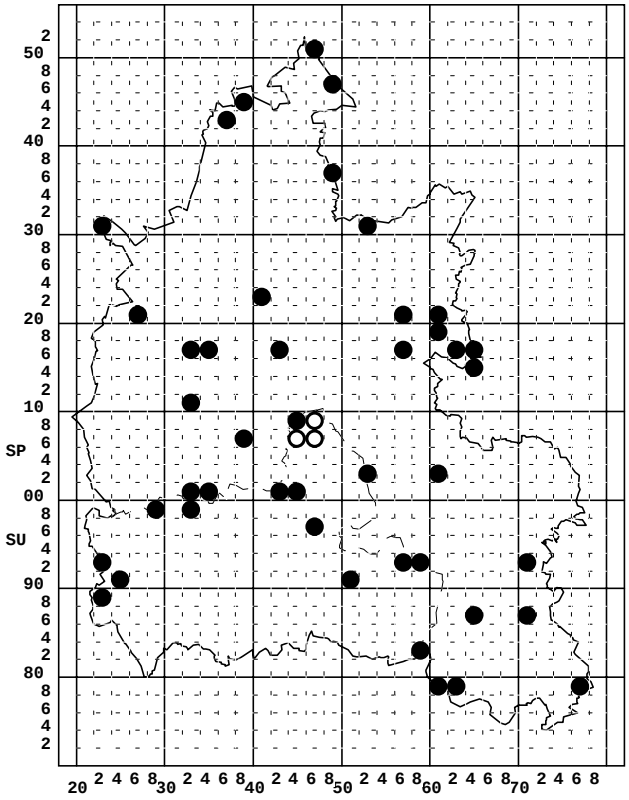
TETRAD COVERAGE



In order to give an indication of the extent of coverage throughout the county all tetrads with at least one millipede or centipede record are shown.

DIPLOPODA: MILLIPEDES
POLYXENIDA: Bristly Millipedes

Polyxenus lagurus (Linne, 1758)



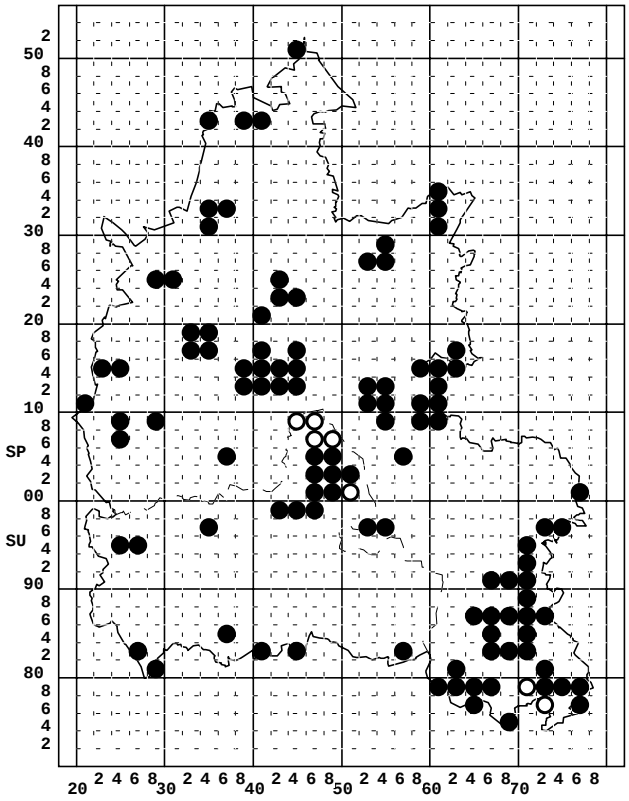
vc.22 & vc.23

The bristly millipede is an unusual species somewhat reminiscent of a small woodlouse and once though to be a centipede! It is fairly common in the county and found in a variety of dry microsites. It can be numerous under the bark of river-side willow pollards above winter flood levels. It is also found under the bark of dead trees in ancient woodland and under moss or loose stones on walls.

In England and Wales this is a frequent species under bark, on walls and occasionally in coastal shingle.

GLOMERIDA: Pill Millipedes

Glomeris marginata (Villers, 1789)

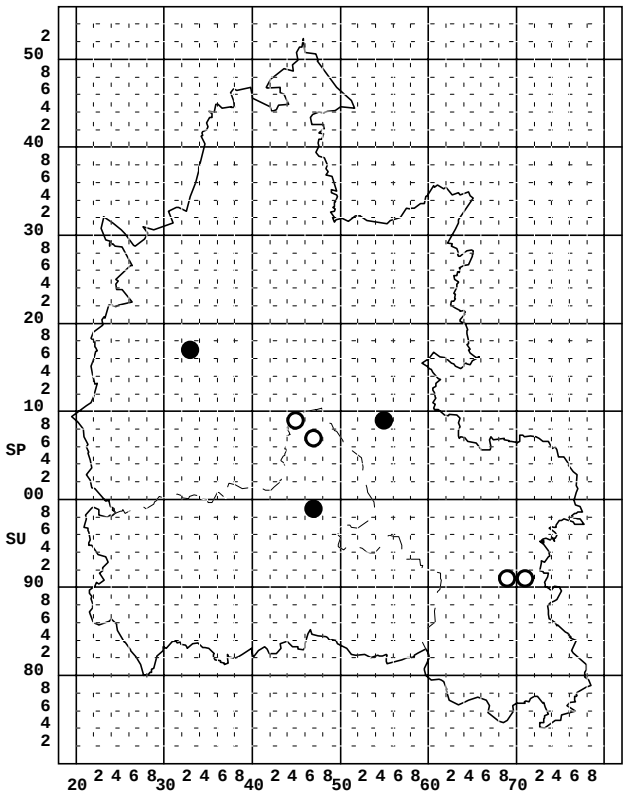


vc.22 & vc.23

This familiar pill-millipede can be locally common in a variety of shady habitats, on either calcareous, or acidic, friable soils. In the clay vales it is surprisingly uncommon and confined to ancient woodlands. It can be confused with the 'pill-woodlice' (*Armadillidium* spp. and *Cylisticus*)

This is the fourth most common species in Britain but is absent from northern Scotland.

Stygioglomeris crinita Brolemann, 1913



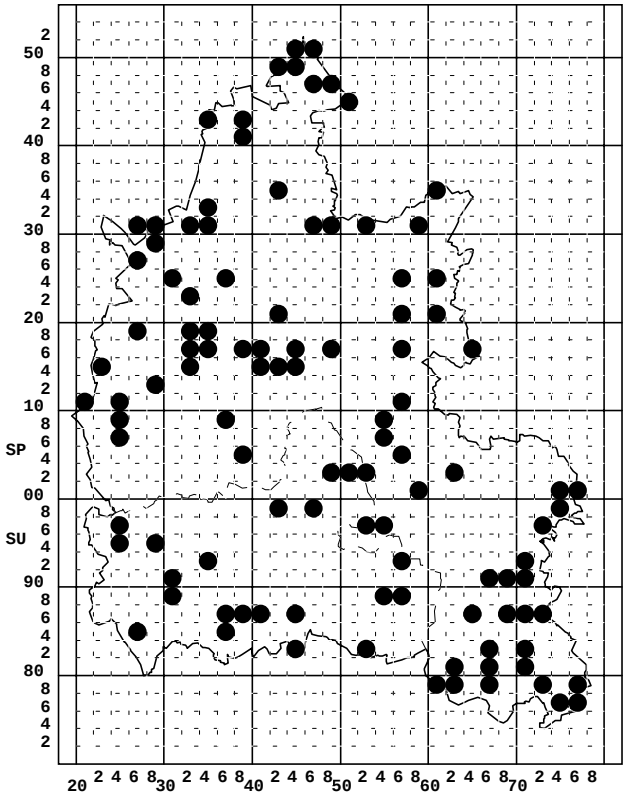
vc.22 & vc.23

This small blind soil dwelling pill-millipede has proved very elusive in the county. It was recorded as new to Britain from Wytham Woods in 1950 and subsequently collected from soil core samples on several occasions by the Wytham Survey. There are three recent records where it was found under dead wood and moss. All records are from ancient deciduous woodlands on friable calcareous soils. It is probably very under recorded in the county.

Outside Oxfordshire this is a widespread but apparently uncommon species, often collected in soil samples, from both semi-natural habitats and disturbed sites such as churchyards.

CHORDEUMATIDA

Nanogona polydesmoides (Leach, 1815)

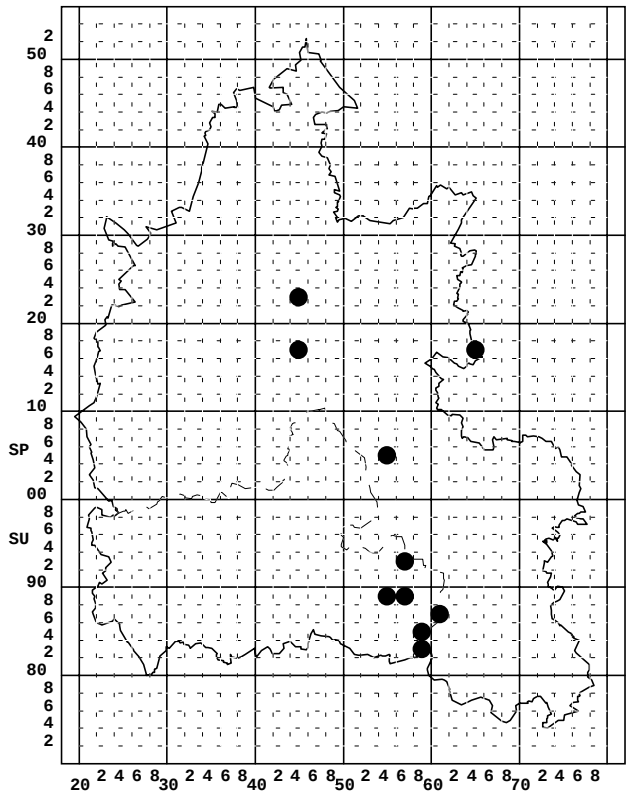


vc.22 & vc.23

The only common member the Chordeumatida in the county. It occurs in a wide range of habitats from churchyards to ancient woodlands, usually on calcareous soils. In the summer months the distinctive 'hairy' immatures can be readily found. These give rise to adults during winter. Though not related it is superficially rather like a large *Polydesmus* spp. in appearance.

This species is common throughout Britain.

Brachychaeteuma melanops Brade-Birks, 1918

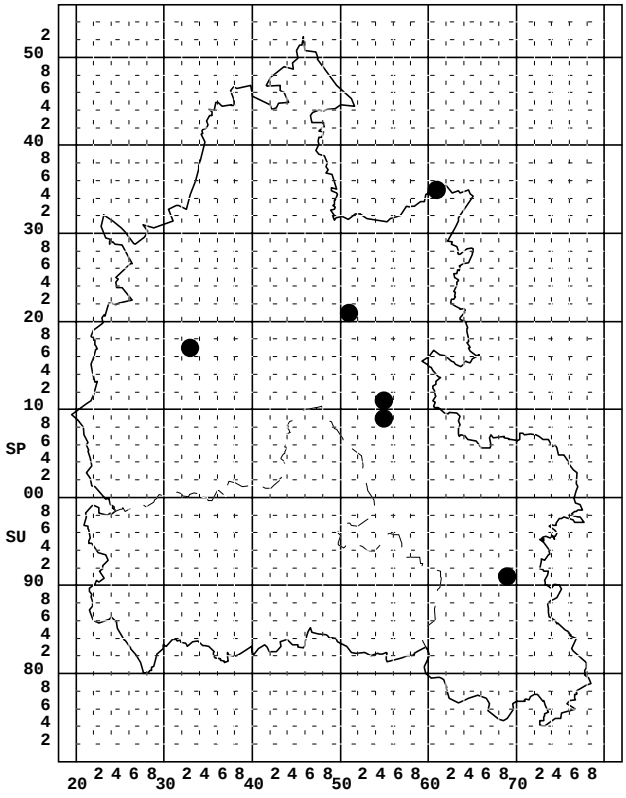


vc.22 & vc.23 Notable

A scarce species in the county. Records are typically from rather disturbed sites such as periodically flooded riverside meadows or churchyards. Specimens are usually found under large stones or dead wood resting on clay. Adults have been found from November to April. It possibly displaces *B. bradeae* from disturbed sites in the county.

This southern species is at the edge of its British range in Oxfordshire

Brachychaeteuma bradeae (Brolemann & Brade-Birks, 1917)

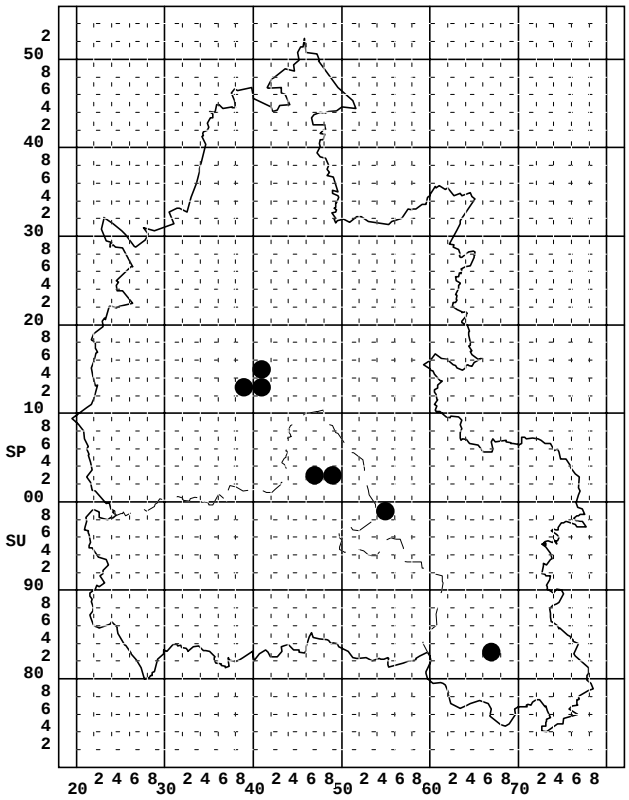


vc.23 only Notable

This is another scarce winter active species. In contrast to *B. melanops* it is typically found in more semi-natural habitats such ancient woodland, where small numbers can be found beneath dead wood or stones.

This species occurs sporadically from Oxfordshire northwards to the Scottish borders. Elsewhere it shows a marked preference for disturbed sites such as gardens.

Chordeuma proximum Ribaut, 1913

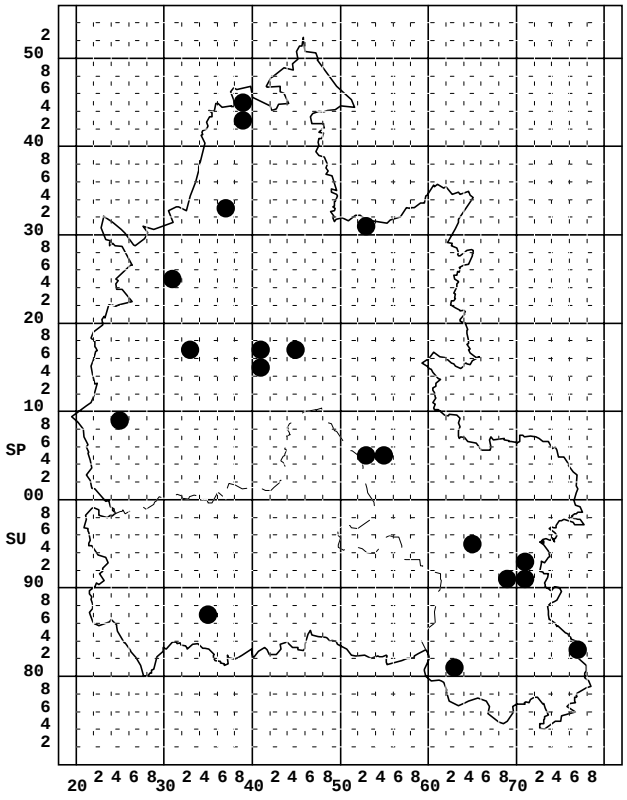


vc.22 & 23

A recent addition to the county list first collected in October 1992, from an ancient deciduous woodland on acidic sands, near Nuneham Courtenay. Subsequently it has been found at a few other deciduous woodlands where acidic soils occur, reflecting the scarcity of this habitat in the county.

This species is common in Wales, where it has shown a recent expansion in range. In England it is mainly found in the extreme south. These isolated Oxfordshire records probably represent relict populations rather than a continuation of the expansion seen in Wales.

Melogona scutellare (Ribaut, 1913)



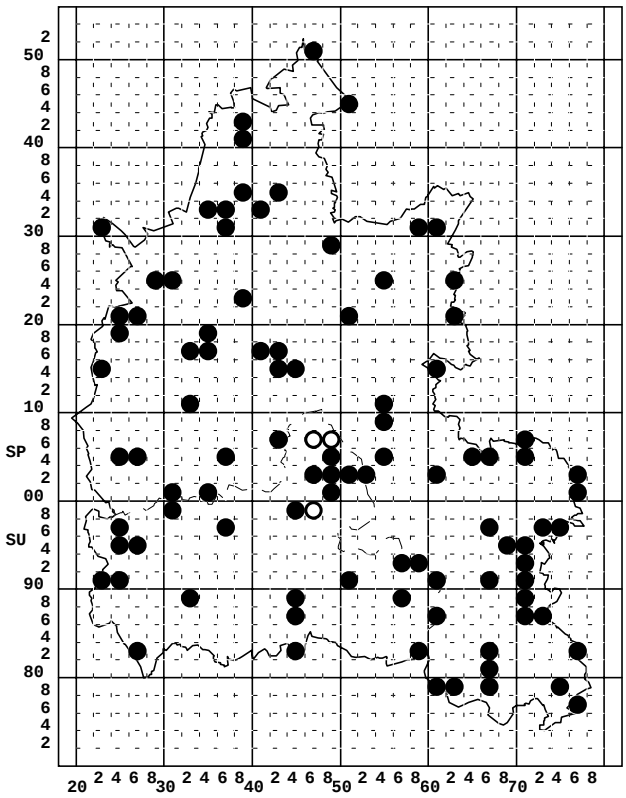
vc.22 & vc.23

Adults of this widespread but local species are found in the winter months (October to April). Typically it occurs amongst litter or under deadwood in damp woodland. A few records are from churchyards where it is usually found near compost heaps.

Nationally a local species most common in northern England.

JULIDA: Snake Millipedes

Nemasoma varicorne C.L.Koch, 1847

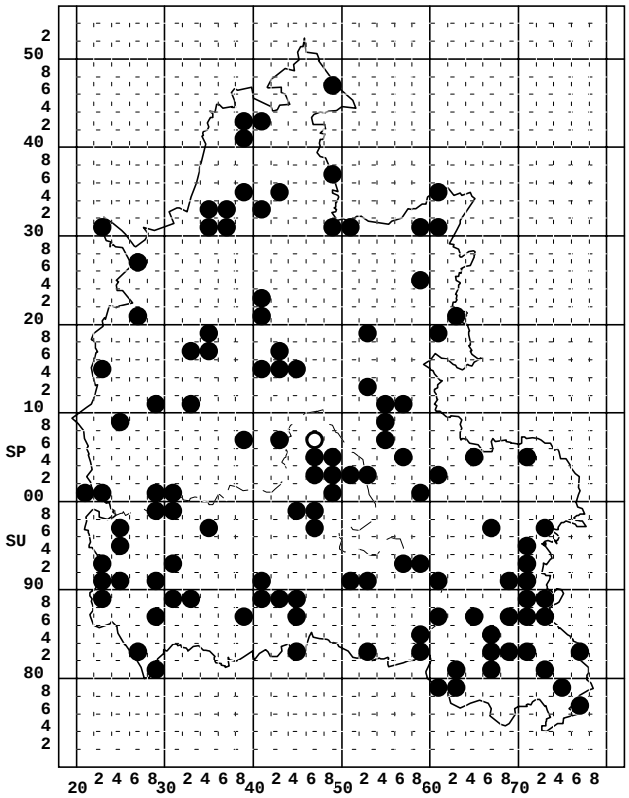


vc.22 & vc.23

A common millipede in the county found under the bark of fallen and standing deadwood or on live trees such as old willow pollards. Sometimes found with *Proteroiulus fuscus* but typically found under closer fitting (less rotten) bark than this species.

Nationally a widespread and fairly common sub-cortical species.

Proteroiulus fuscus (Am Stein, 1857)

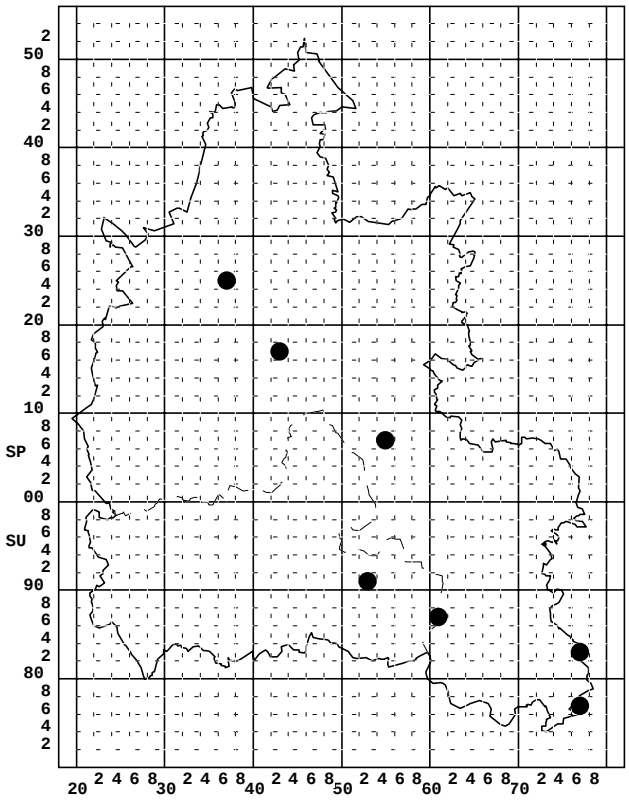


vc.22 & vc.23

Another common species found under the bark of both living and dead trees (often with *N. varicorne*) in a wide range of habitats. Occasionally it is collected from deep leaf-litter in woodlands or within compost heaps.

Nationally one of the commonest species of millipede throughout Britain.

Choneiulus palmatus (Nemec, 1895)

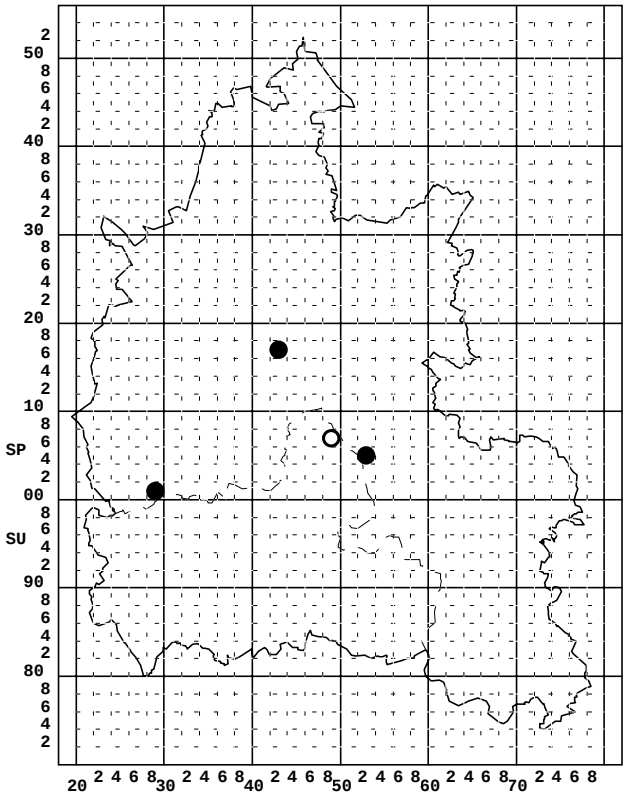


vc.22 & vc.23

The few records are mainly from compost heaps or beneath dead wood in disturbed sites such as churchyards, quarries and railway sidings. Many sites are close to the River Thames and this may be significant. This species, and *N. kochii* below, can be easily overlooked as the common *P. fuscus*.

Records for this species are scattered throughout the British Isles, but it seems predominantly coastal.

Nopoiulus kochii (Gervais, 1847)

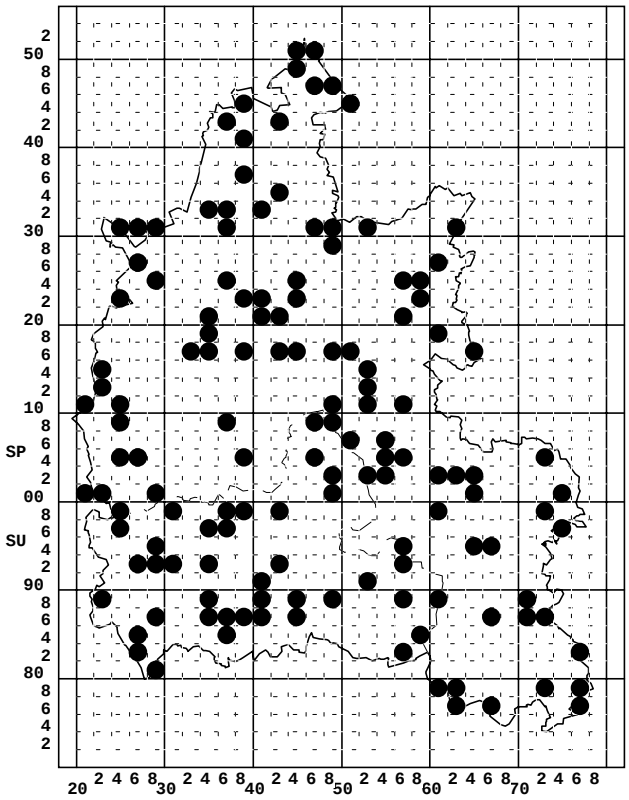


vc.23 only Notable

A rare species in the county with three confirmed records. First recorded in the 1980's from a disused landfill near Oxford. At a small disused quarry near Woodstock it was numerous amongst dumped dead wood and other debris in association with the scarce *C. palmatus* and *Cylindroiulus parisiorum*. Recently it has been found under stones in a farm yard. A 1954 record from the University Field Station near Wytham needs confirming.

Blower (1985) notes that old British records for this species are erroneous. Subsequently *N.kochii* has been reliably recorded from a few sites around Britain often near the coast.

Blaniulus guttulatus (Fabricius, 1798)

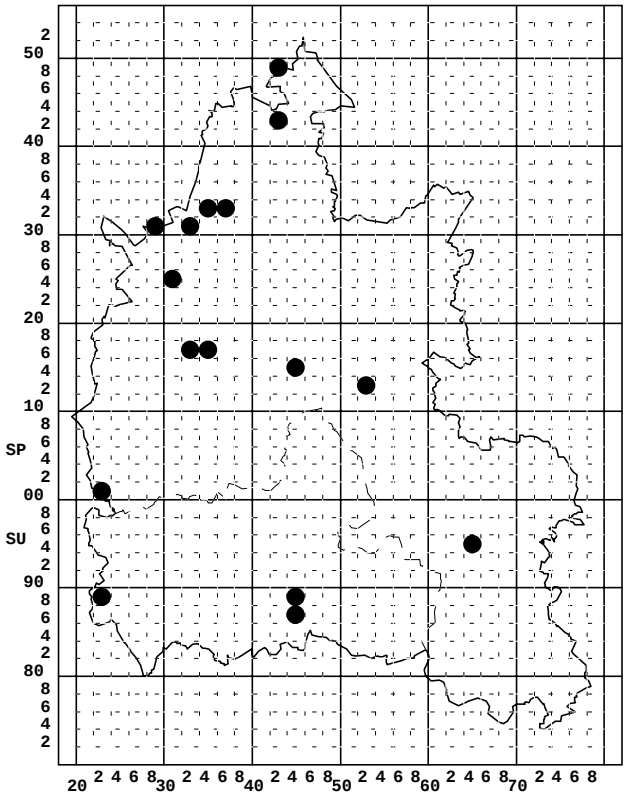


vc.22 & vc.23

This common soil dwelling species may prove ubiquitous in the county. Records are from a variety of habitats such as arable fields, gardens, meadows and ancient woodland. It is typically found under stones or dead wood and can be numerous.

This is the commonest of the blind Julids in Britain, though absent from the north of Scotland.

Archiboreoiulus pallidus (Brade-Birks, 1920)

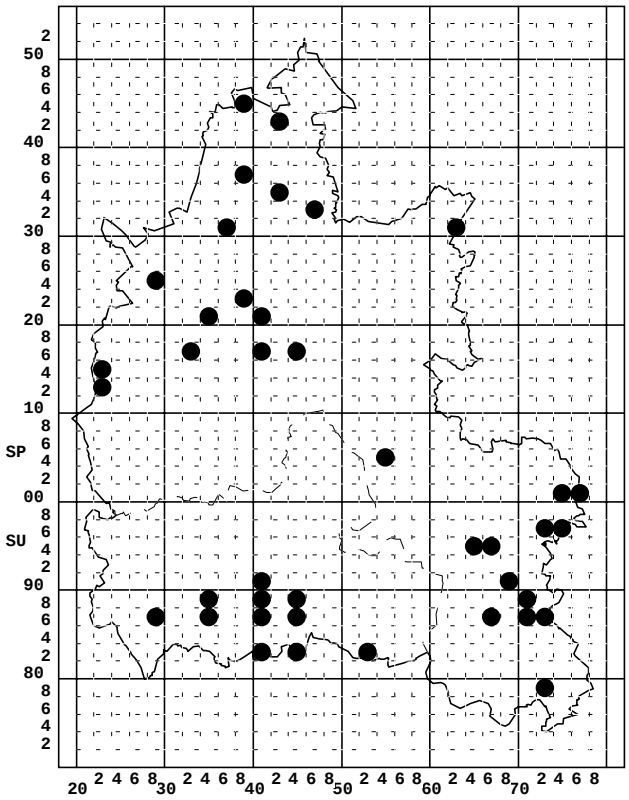


vc.22 & vc.23

A local species in the county recorded from friable calcareous soils, in churchyards and natural sites including grassland and river banks. It appears to be more widespread on the Oolite in the north of the county. It is similar in appearance to the common *Blaniulus guttulatus* with which it often occurs.

Although widespread in Britain it is always local, but seems to be more common in the north.

Boreoiulus tenuis (Bigler, 1913)

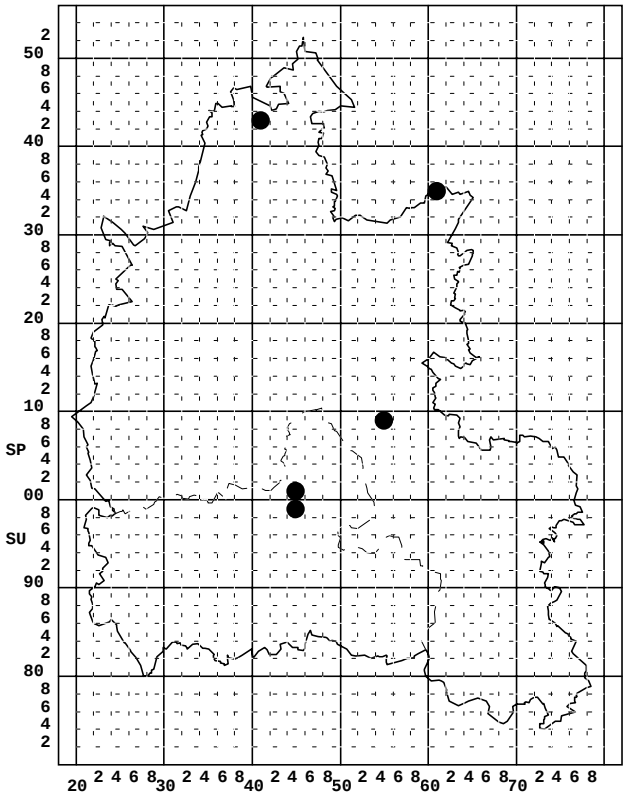


vc.22 & vc.23

This small species is frequent on the Chiltern chalk and on the Jurassic limestone and ironstone in the north of the county. It has been found in a wide range of habitats from churchyards to grassland and ancient woodland, but always on friable calcareous soils. During winter it seems to be much easier to find and can sometimes be numerous under large stones and dead wood.

A local species throughout Britain confined to areas with calcareous soils.

Ommatoiulus sabulosus (Linne, 1758)

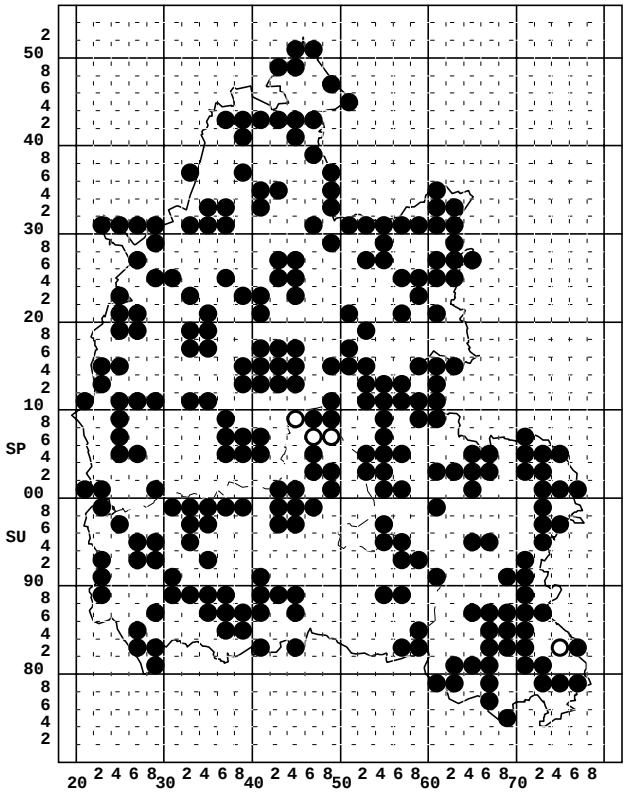


vc.22 & vc.23

This large dark species, with two contrasting bright orange dorsal stripes, is unmistakable, but none-the-less rare in the county. On the Corallian ridge it has been collected from relict heathland and sandpits. In the north of the county it was found within iron-stone railway cuttings. Though found at ground level it is also readily beaten from scrub, such as Gorse.

This is a common, often ubiquitous, species in much of Britain with a preference for sandy soils. In central southern England it is inexplicably scarce.

Tachypodoiulus niger (Leach, 1815)

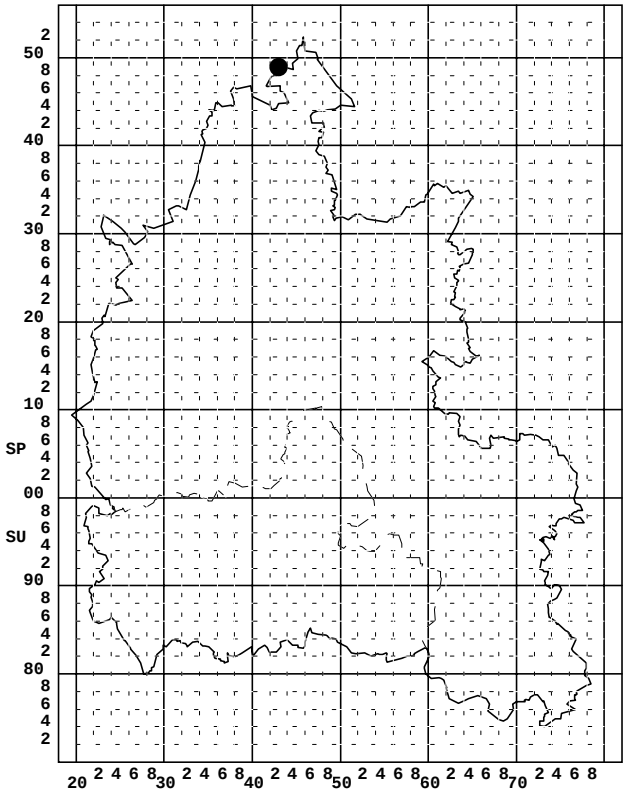


vc.22 & vc.23

A common and ubiquitous species in the county found under stones and dead wood, on walls and under loose bark on trees. It should occur in all tetrads.

This is the second most common millipede in Britain but the most frequently encountered species in gardens and houses.

Allajulus nitidus (Verhoeff, 1891)

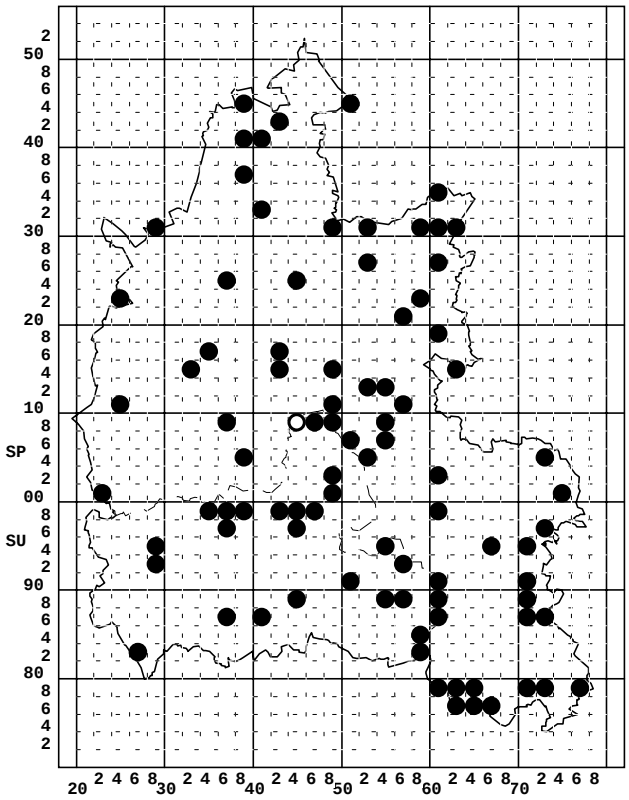


vc.23 only

This species, previously known as *Cylindroiulus nitidus,* is a recent addition to the county list. In August 1993 several specimens were found under ironstone slabs, within an ancient deciduous woodland, in the north of the county. Considering its large size it is believed to be genuinely rare in the county, despite its subterranean habits.

This is an uncommon species, with an apparent eastern distribution in Britain, usually collected from friable calcareous soils.

Cylindroiulus caeruleocinctus (Wood, 1864)

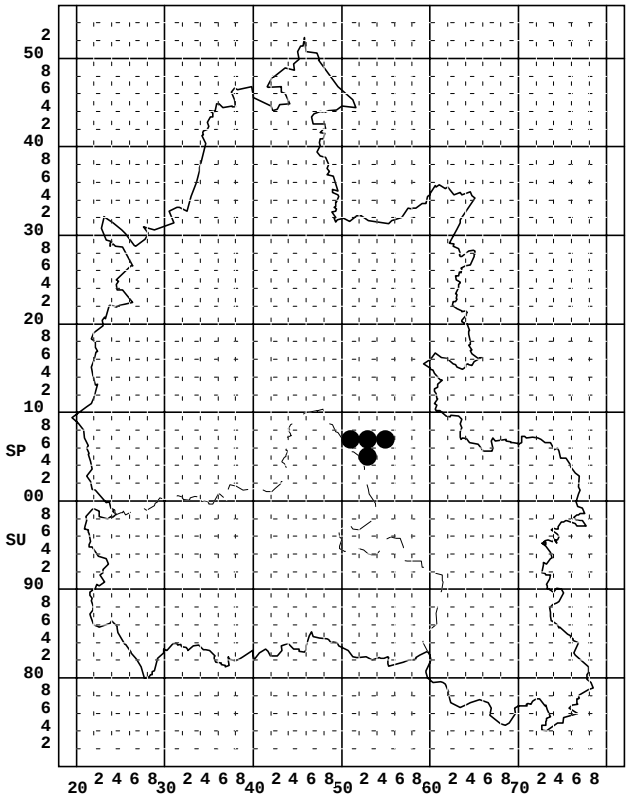


vc.22 & vc.23

When fully grown this is a large and distinctive millipede. Records are typically from churchyards or gardens, but it can be numerous in semi-natural calcareous grasslands. A 1954 record for *C. londinensis* from Wytham Woods (of which *C. caeruleocinctus* was once considered a variety) has not been mapped.

This species is most common in the south-east but there are isolated records from Scotland, Ireland and Wales.

Cylindroiulus vulnerarius (Berlese, 1888)

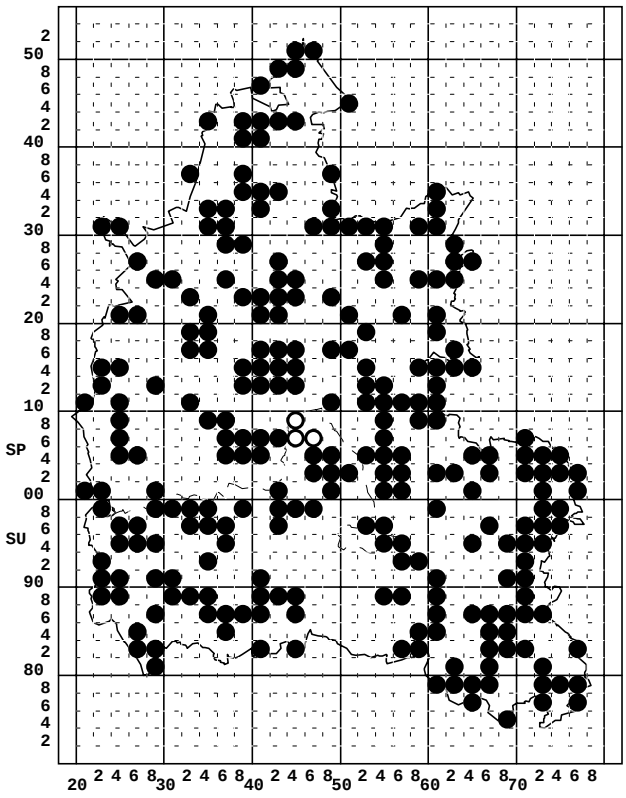


vc.23 only

A blind, pallid soil dwelling species widely recorded from Oxford city. It has been collected mainly from gardens under paving slabs and in compost heaps. At an Oxford garden centre it was numerous amongst 'chipped bark' covering soil in a shrub display throughout the winter months, but proved very elusive in the summer. It is possibly present in other old towns in the county.

This south European millipede is a recent addition to the British list. Now known from about a dozen sites in Britain it is almost certainly an accidental introduction to this country.

Cylindroiulus punctatus (Leach, 1815)

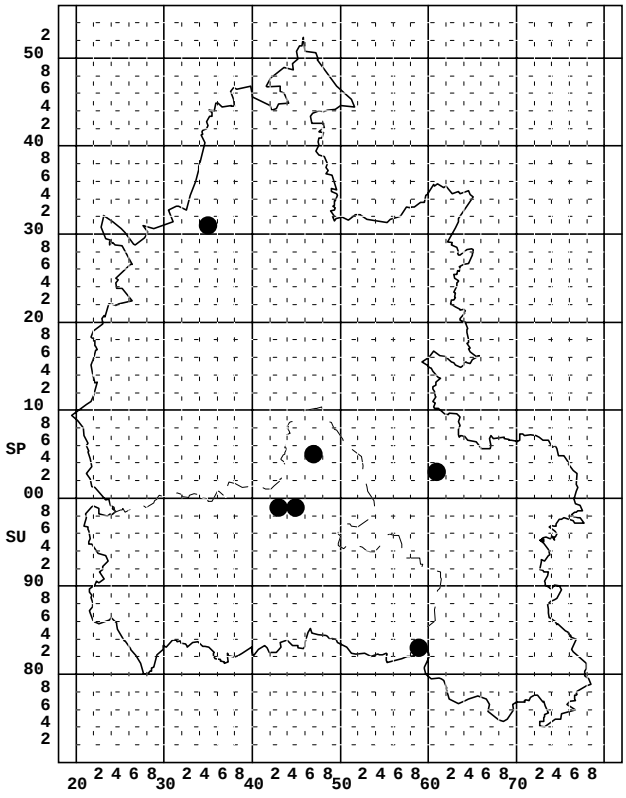


vc.22 & vc.23

Probably the commonest millipede in the county, this species is readily found wherever rotting deadwood (including old planks) occurs. Also found under the bark of live trees, in compost heaps and amongst leaf-litter in woodlands. It should be present in all tetrads.

This is the most abundant and ubiquitous millipede throughout Britain.

Cylindroiulus latestriatus (Curtis, 1845)

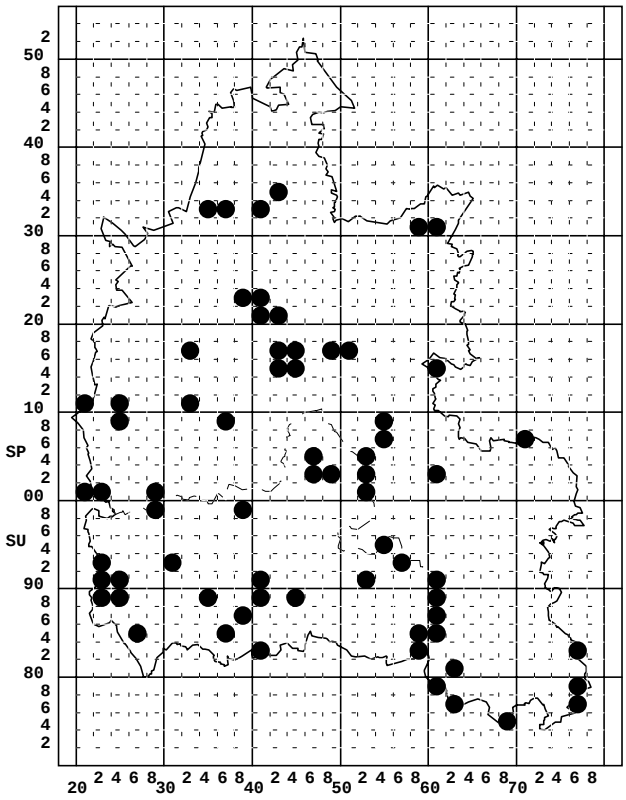


vc.22 & vc.23

This soil dwelling species is scarce in the county. Most records are from amongst plant roots on grassy heaths on the Corallian sands, but also from sandy soils in churchyards. In the north of the county it was collected amongst stones in a disused railway cutting. Blower (1985) also records it from 'Oxford' (SP50). Specimens can only be separated from the common *C. britannicus* by dissection.

This is a common coastal species typically on fixed dunes or shingle but occasionally on light soils inland.

Cylindroiulus britannicus (Verhoeff, 1891)

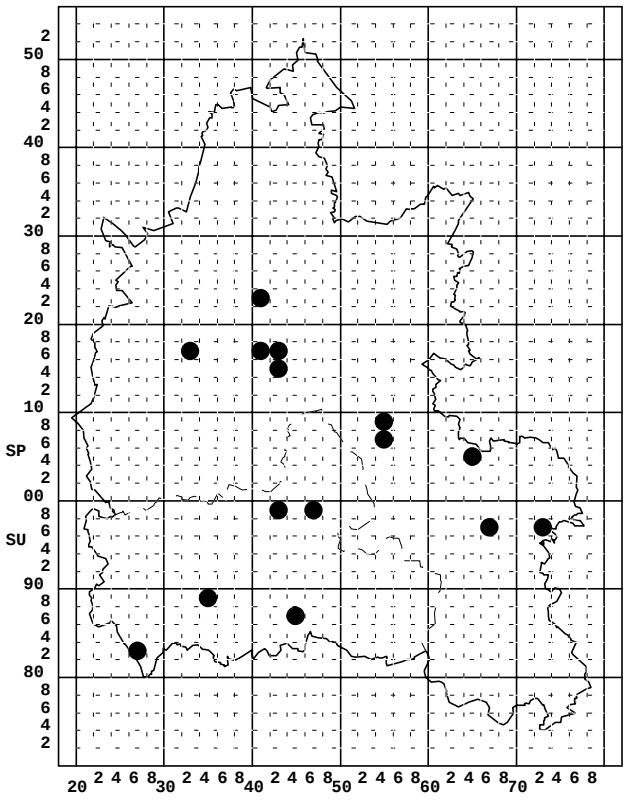


vc.22 & vc.23

A fairly common dead wood species in the county. Typically found under the bark of old waterside willow pollards, or within and beneath fallen rotting timber in woodlands. It has been found within compost heaps in churchyards and gardens.

C. britannicus is a frequent dead wood species throughout Britain.

Cylindroiulus parisiorum (Brolemann & Verhoeff, 1896)

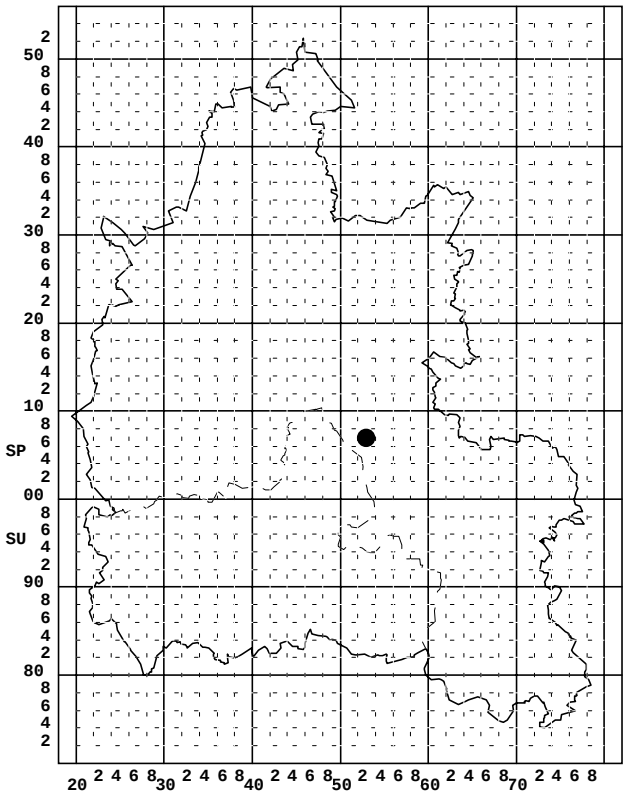


vc.22 & vc.23

An uncommon species in the county. It is often found in well rotted dead wood in both semi-natural woodlands and disturbed sites such as churchyards. It has also been found under the bark of large 'parkland' beech or oak trees. Single specimens have been taken in pitfall traps: once in an old orchard and once in a sallow carr. It is easily overlooked as an immature of *C. britannicus* or the ubiquitous *C. punctatus*.

Throughout England and Wales this is a widespread but uncommon species.

Cylindroiulus truncorum (Silvestri, 1896)

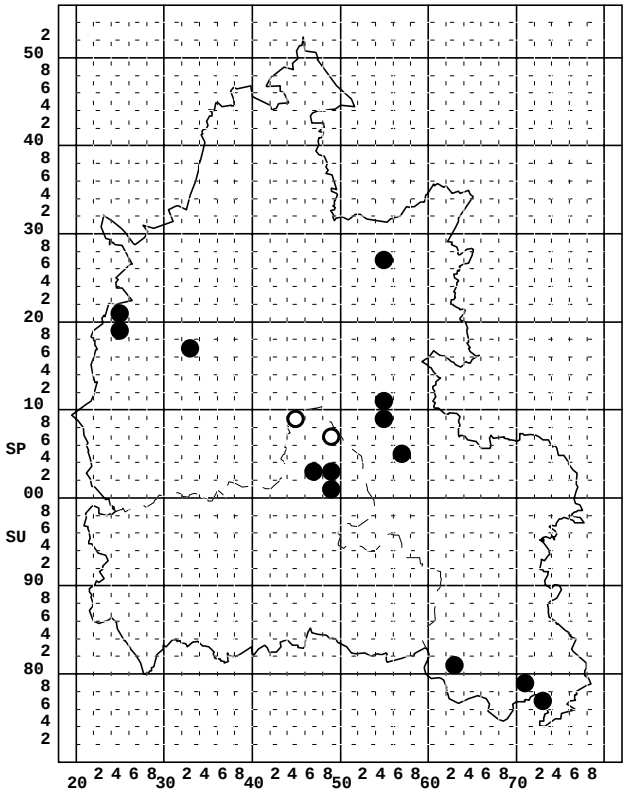


vc.23 only

D.T.Bilton collected this species from the Oxford Botanic Gardens in 1987 but further details are not known.

Outside Oxfordshire it is known from a few sites including Kew Gardens where it has been collected both inside hot-houses and from the surrounding gardens. It is almost certainly a recent, accidental, introduction into Britain.

Julus scandinavius Latzel, 1884

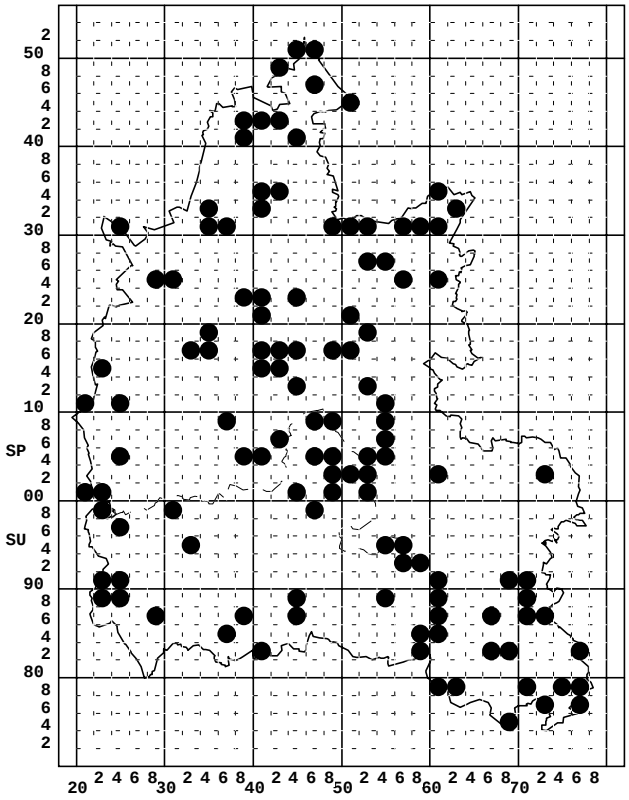


vc.22 & vc.23

An uncommon species in the county recorded from damp areas in sandy or acidic woodland, usually under deadwood or amongst moss. Hand-searching usually reveals few specimens, often mixed with the common, and superficially similar, *Tachypodoiulus niger* and *Ophyiulus pilosus*. Only males can be easily distinguished from the latter. Non-the-less it is genuinely scarce in Oxfordshire.

Nationally a common species but inexplicably scarce over much of central southern England.

Ophyiulus pilosus (Newport, 1842)

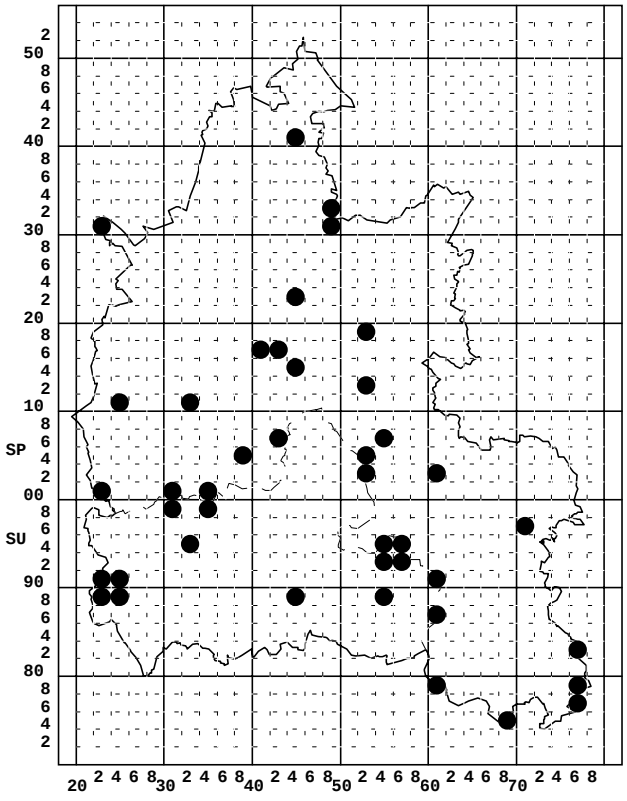


vc.22 & vc.23

A common and ubiquitous species over much of the county found under stones and dead wood, amongst leaf-litter and within compost heaps in a variety of semi-natural and man-made habitats. Only males can be readily distinguished from *Julus scandinavius* (or *Leptoiulus* species which could also occur in Oxfordshire)

An equally common and ubiquitous species throughout Britain.

Brachyiulus pusillus (Leach, 1815)



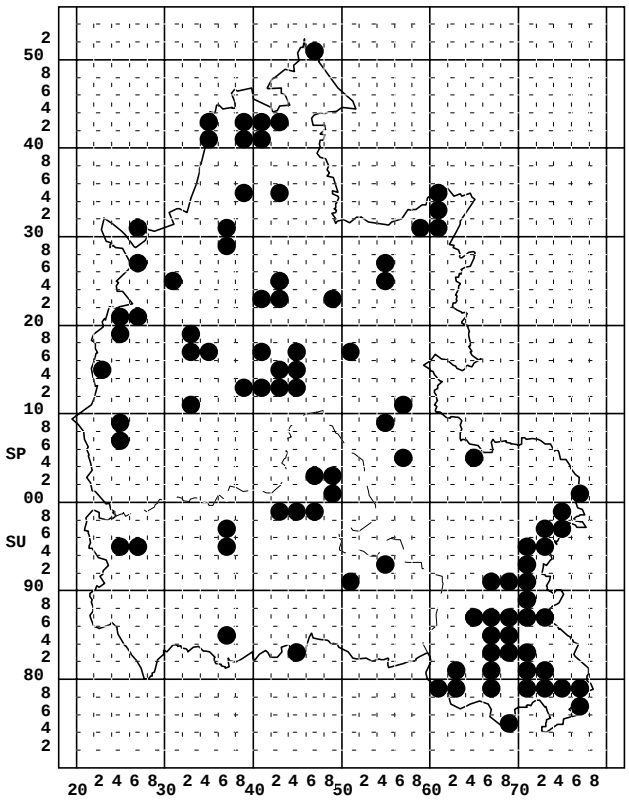
vc.22 & vc.23

This small but distinctive species is typically associated with river-side meadows in the county, where it occurs in grass-litter or under deadwood. It has also been found in drier sites such as gardens, railway sidings and arable fields often within soil.

Outside Oxfordshire this is a frequent species at least in the south of Britain.

POLYDESMIDA: Flat-backed Millipedes

Polydesmus angustus Latzel, 1884

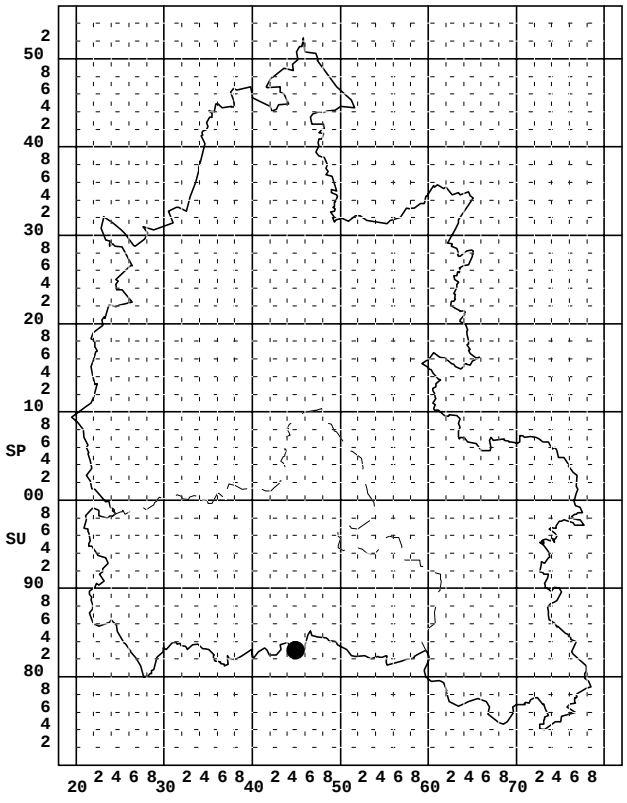


vc.22 & vc.23

A frequent species in the county typically found in the more acidic or drier parts of the county (most notably the Chiltern Hills). It is virtually absent from the clay vales. Almost all records are from semi-natural habitats such as ancient woodland, relict heathland or non-calcareous marsh. It is often found with *P. gallicus* and can only be differentiated by microscopic examination.

Throughout Britain this is a characteristically abundant and ubiquitous species, even within man-made habitats. In central England it seems to be partly replaced by *P. gallicus*.

Polydesmus testaceus C.L.Koch, 1847

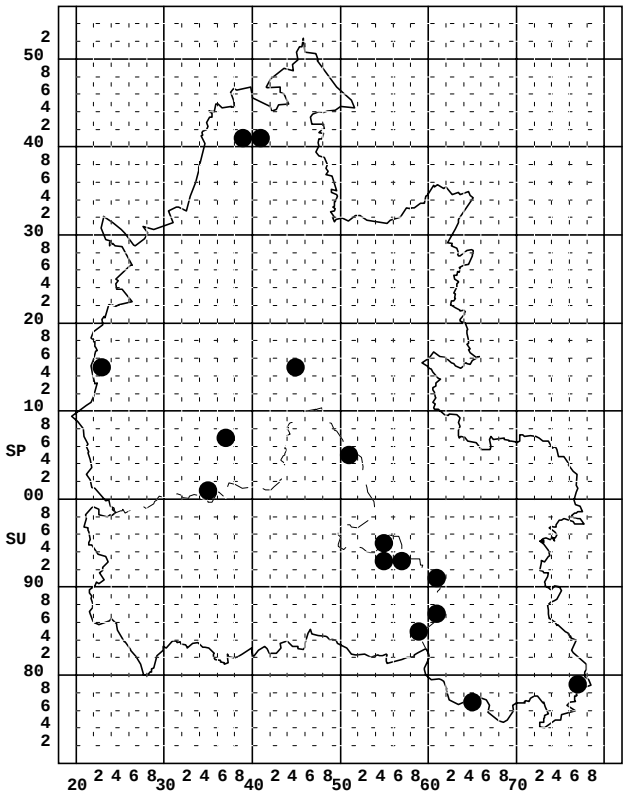


vc.22 only Notable

The latest addition to the county list. During 1995 many specimens were pit-fall trapped in an area of herb rich short turf chalk grassland in the Berkshire Downs. Traps were set on a south-facing slope, which must become very hot and dry in summer. Hand-searching has also revealed the species on the underside pieces of dead wood. It is possible that other sites will be found but most remnants of chalk grassland on the Chiltern escarpment typically face northwest.

The only other recent records for this species in Britain are from a handful of sites in the extreme south east of Kent. Its presence in Oxfordshire is entirely unexpected, but since the site is isolated and typical for the species, it may well represent a relic population.

Polydesmus inconstans Latzel, 1884

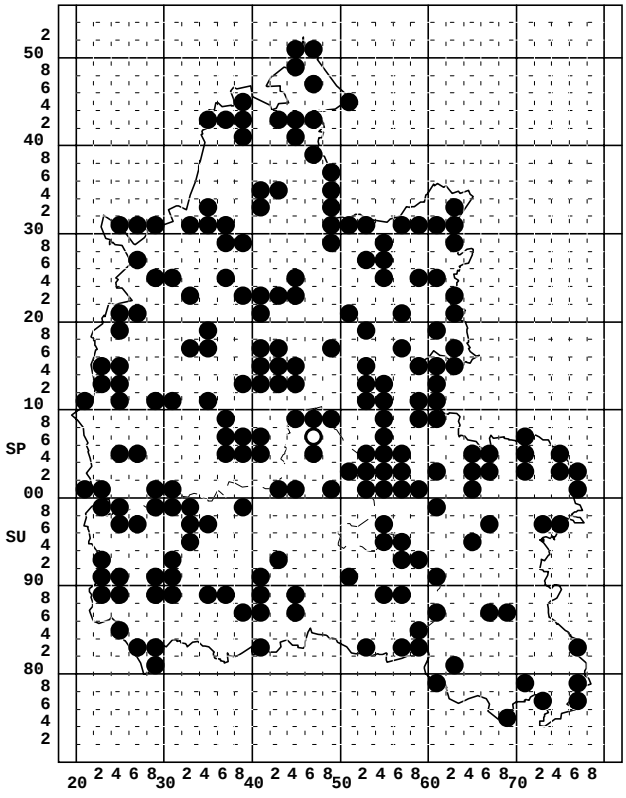


vc.22 & vc.23

A local species collected from damp grassland, mainly beside the River Thames. It is typically found beneath dead wood or within grass-litter. It seems to be highly seasonal with adults recorded between late May and early July. It may be under-recorded in the county.

Throughout Britain this is a frequent species found in a variety of habitats..

Polydesmus gallicus Latzel, 1884

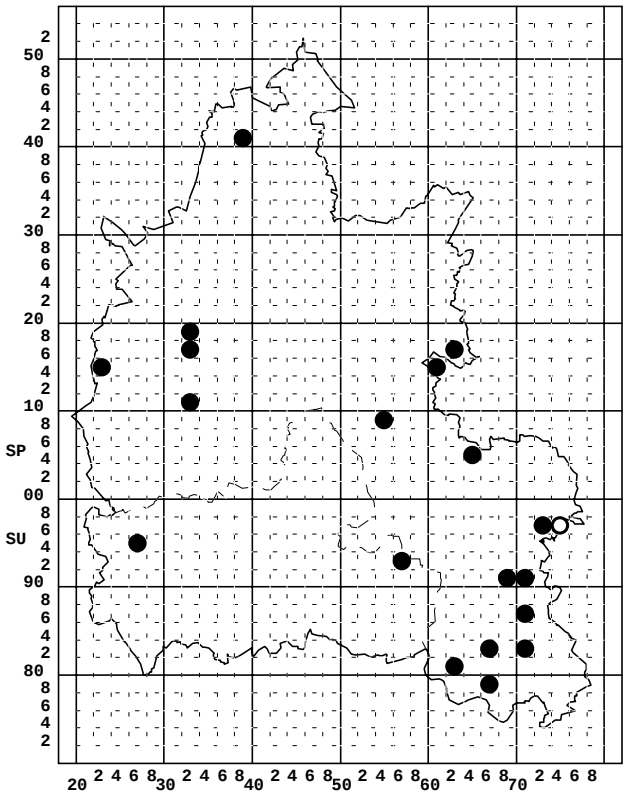


vc.22 & vc.23

By far the commonest of the flat-back millipedes in the county. In a wide range of semi-natural and disturbed sites it is often abundant. On the Chiltern Hills in the south-east (an area where *P. angustus* abounds) it is much more local and mainly confined to the course of the River Thames.

In much of the southern England this is a common species, especially in wet sites, but becomes rare in the north.

Polydesmus denticulatus C.L.Koch, 1847

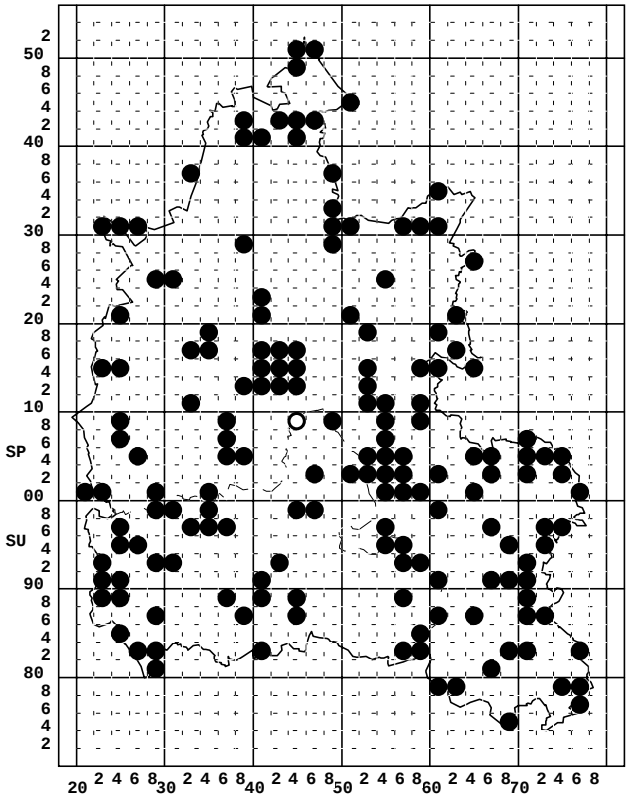


vc.22 & vc.23

This species is apparently local in the county and usually collected from deciduous woodland. It seems to be more frequent in the well-wooded Chiltern Hills. Hand-searching under deadwood or in leaf-litter rarely reveals more than single specimens. However it is readily taken in pitfall traps suggesting it is elusive and possibly under recorded.

This is a frequent species in Britain often found in deciduous woodland.

Brachydesmus superus Latzel, 1884

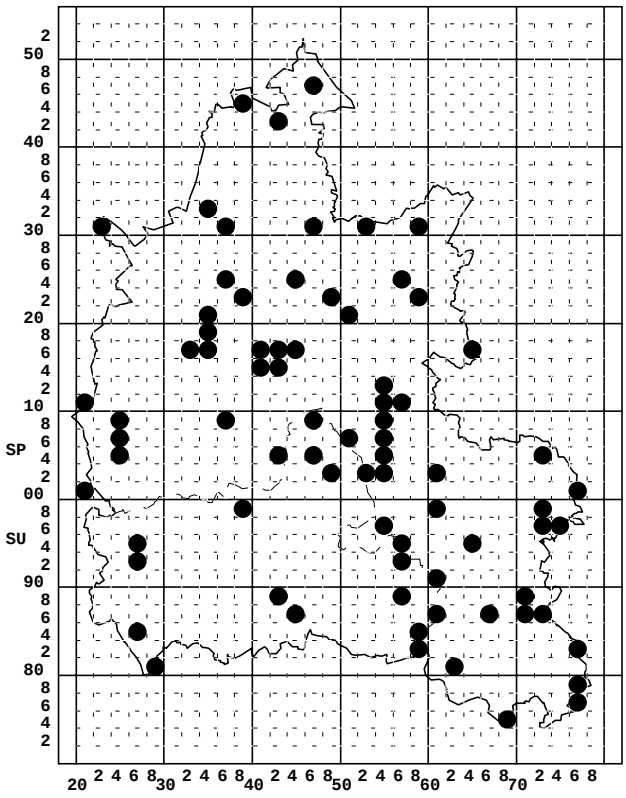


vc.22 & vc.23

Another common flat-back millipede in the county. It is found, sometimes in abundance, under dead wood or stones, amongst leaf-litter or within compost heaps in a variety of habitats, such as damp woodlands, meadows and churchyards.

Throughout the British Isles it is equally common in many habitats.

Macrosternodesmus palicola Brolemann, 1908

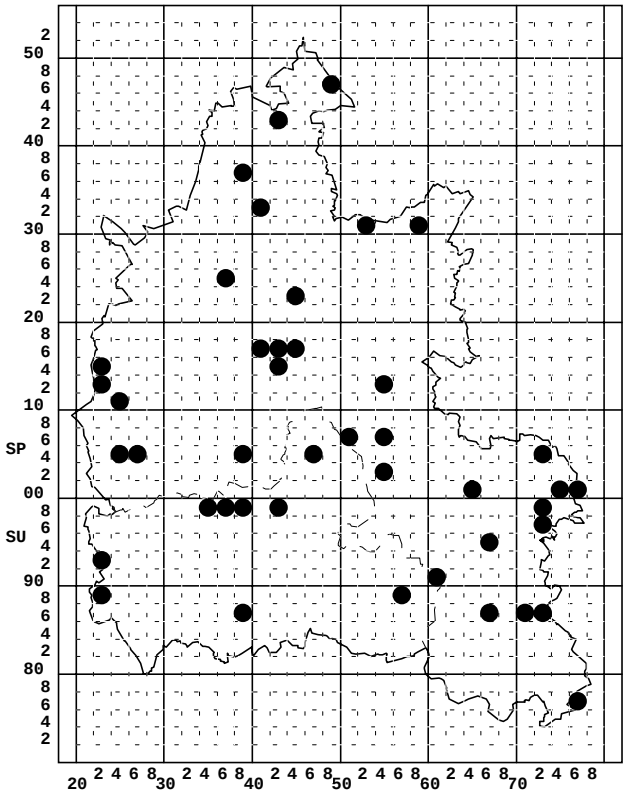


vc.22 & vc.23

This small white flat-back is Europe's smallest millipede. Though elusive it may prove common throughout much of the county. It inhabits friable calcareous soils and is usually found in small numbers under large stones, especially in the winter months. Records are mostly from churchyards or gardens but it is also a characteristic species of the ancient deciduous woodlands of the Chiltern escarpment.

Apparently local in Britain, it is possibly overlooked, and may prove much more common.

Ophiodesmus albonanus (Latzel, 1895)

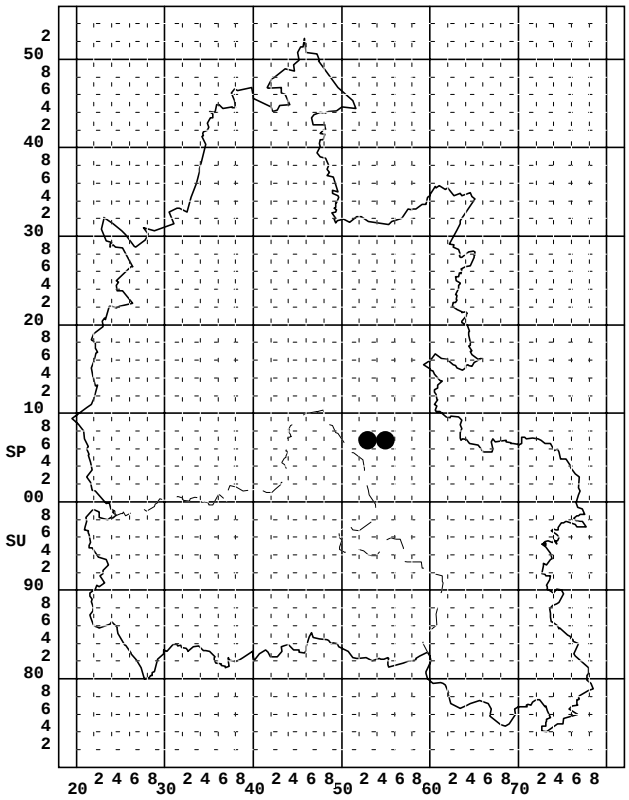


vc.22 & vc.23

Another small, pallid species inhabiting friable calcareous soils. It is often found with *M. palicola* beneath large stones and like this species it also occurs in the apparently contrasting habitats of disturbed churchyards or gardens and semi-natural Chiltern escarpment woodlands. However it is much less widespread and easiest to find in spring.

This is a local species occurring in areas of calcareous soils in England and Wales. It is probably under-recorded.

Oxidus gracilis (C.L.Koch, 1847)

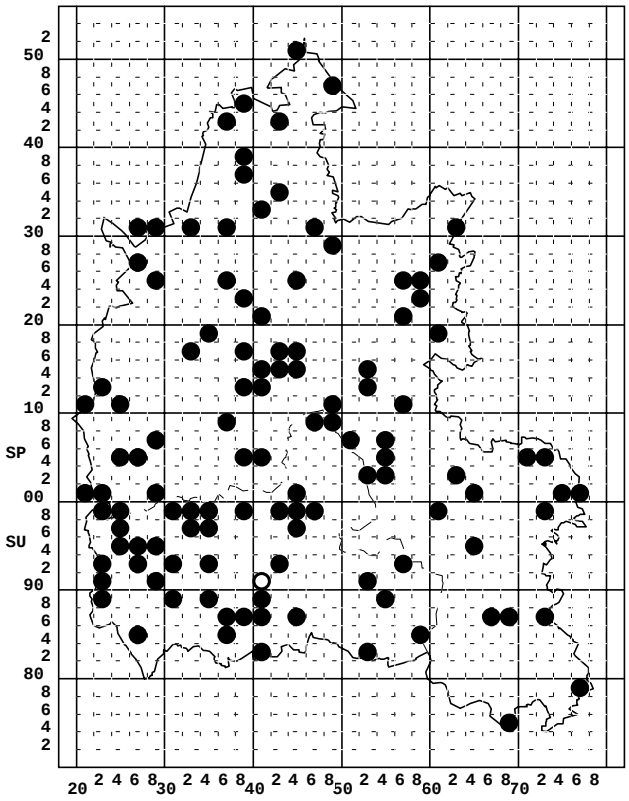


vc.23 only

This species is unable to survive outside heated greenhouses in Britain and cannot be considered a true component of the county fauna. It is well established at the Oxford Botanic Gardens and will almost certainly occur in other old heated greenhouses where pesticide usage is minimal. Single vagrant specimens have been taken amongst house-plant displays at an Oxford garden centre (assumed to be introduced via a nursery) but there is little chance of a population becoming established.

This is a cosmopolitan hothouse species widely recorded throughout Britain.

CHILOPODA: CENTIPEDES
GEOPHILOMORPHA: Wire Centipedes
Haplophilus subterraneus (Shaw, 1789)

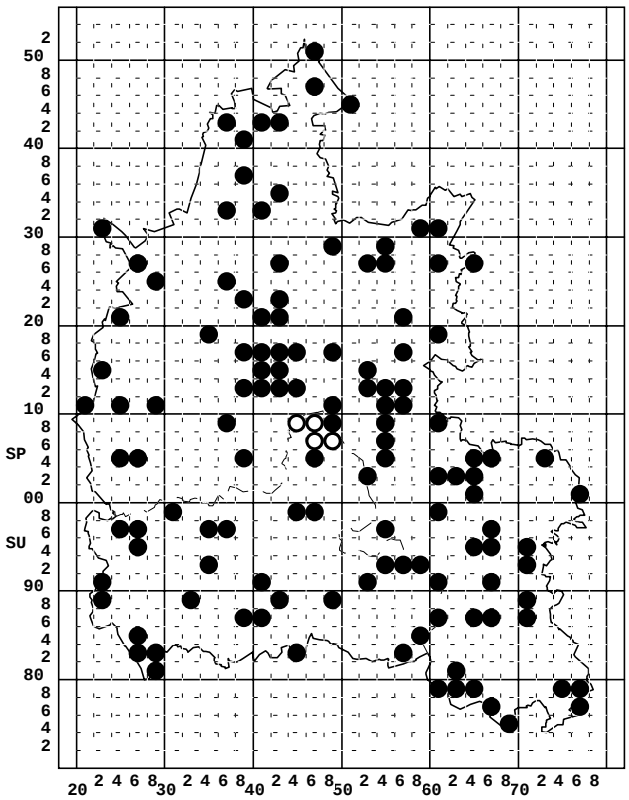


vc.22 & vc.23

A large and conspicuous species commonly encountered under stones and dead wood in synanthropic sites such as disused quarries and churchyards. In the south west of the county it seems to be rather more numerous. Occasionally it is found in semi-natural sites such as woodlands.

A common species in England and Wales, particularly towards the west, and often found in urban sites.

Schendyla nemorensis (C.L.Koch, 1837)

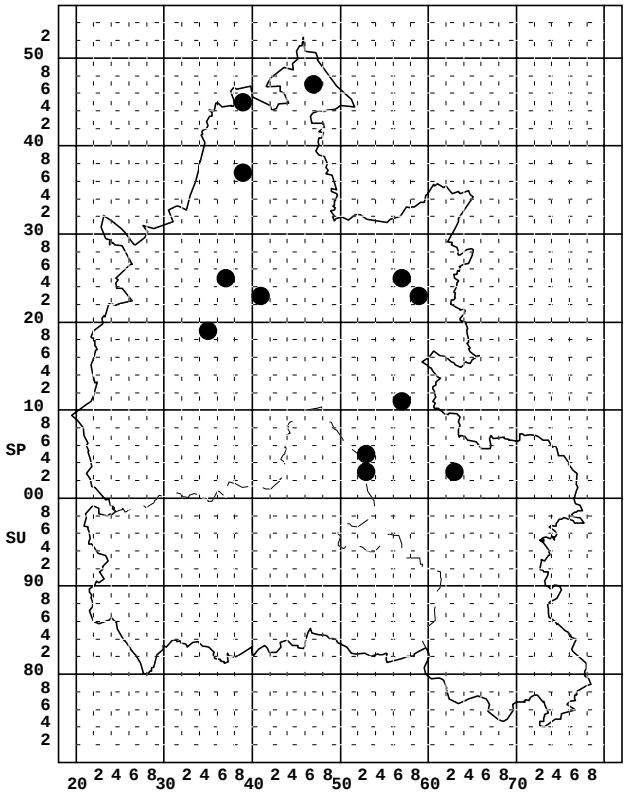


vc.22 & vc.23

In a variety of habitats from ancient woodland and calcareous grassland to churchyards and gardens this is a common, but rather elusive, species. It is usually found under stones or within soil but occasionally under moss and bark on dead wood.

This common species occurs in a variety of inland and coastal habitats throughout Britain.

Brachyschendyla dentata Brolemann & Ribaut, 1911

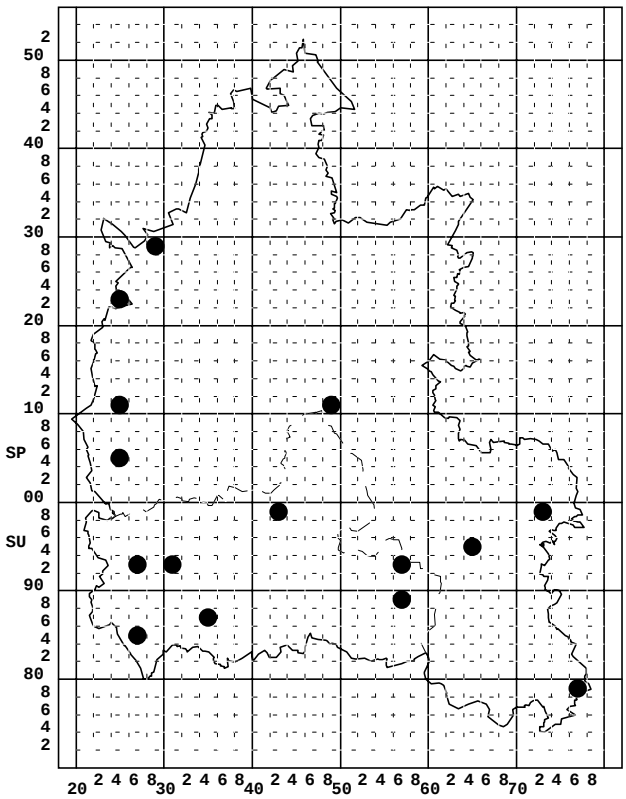


vc.23 only Notable

During the 1990's this small and elusive species has been collected from several churchyard with sandy or friable calcareous soils. Single specimens have been found, usually in the winter months, by carefully searching the underside of large stones (e.g. stacked gravestones) or by sorting the superficial soil layer beneath. Apparently absent from the south and west of the county where the equally scarce *H. brevis* occurs.

An apparently rare species known from a few sites in England where it is often found in soil samples from urban sites. It is probably very under recorded and may prove widespread in urban areas.

Henia brevis Silvestri, 1896

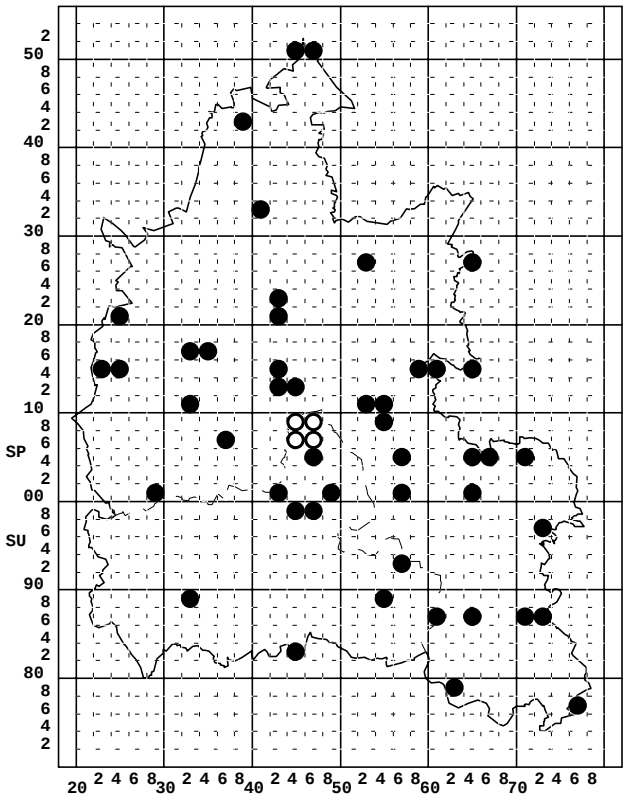


vc.22 & vc.23 Notable

Another small elusive soil dwelling centipede, which like *B. dentata,* is found under large stones in gardens and churchyards, especially in winter. It is widespread in at least the south of the county and appears to have a mutually exclusive distribution with *B. dentata.* The reason is not clear and would repay further study.

This species, previously recorded from a handful of sites in southern England, is probably very under recorded and may prove widespread in urban sites.

Strigamia crassipes (C.L.Koch, 1835)

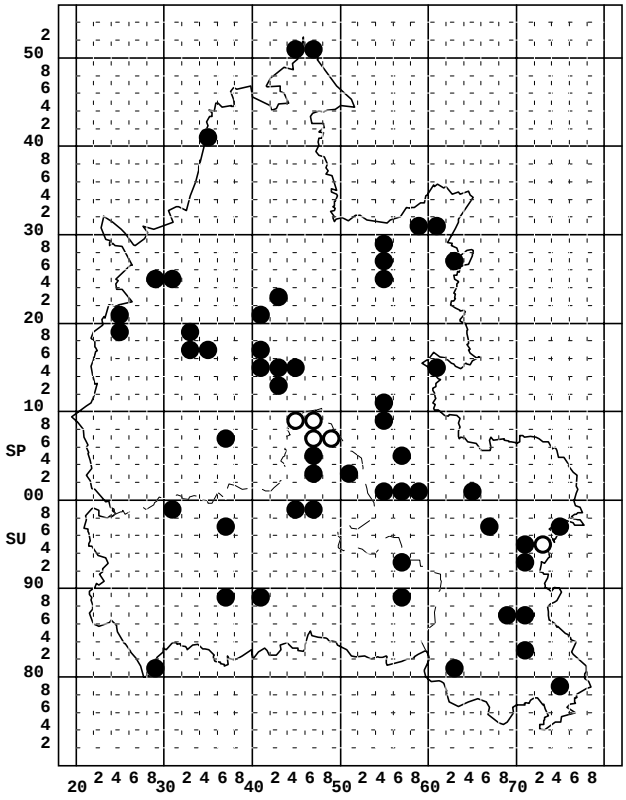


vc.22 & vc.23

A frequently encountered and characteristically rural centipede found in woodland, scrub and river-side meadows throughout the county. It is often found beneath or within dead wood, more rarely amongst leaf-litter and moss.

This local species is found mainly in southern England typically in rural sites.

Strigamia acuminata (Leach, 1814)

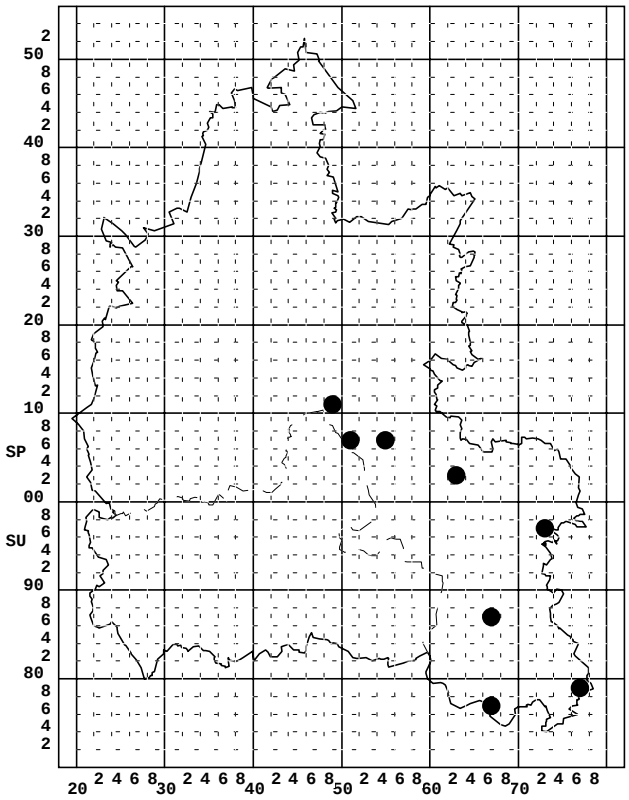


vc.22 & vc.23

Another widespread and distinctly rural species found in similar locations to *S. crassipes* though it is often found in wetter sites, such as wet-woodland, fen and marsh. However the two often occur together especially in ancient woodland.

Found locally throughout England and Wales with a marked preference for rural sites.

Clinopodes linearis (C.L.Koch, 1835)

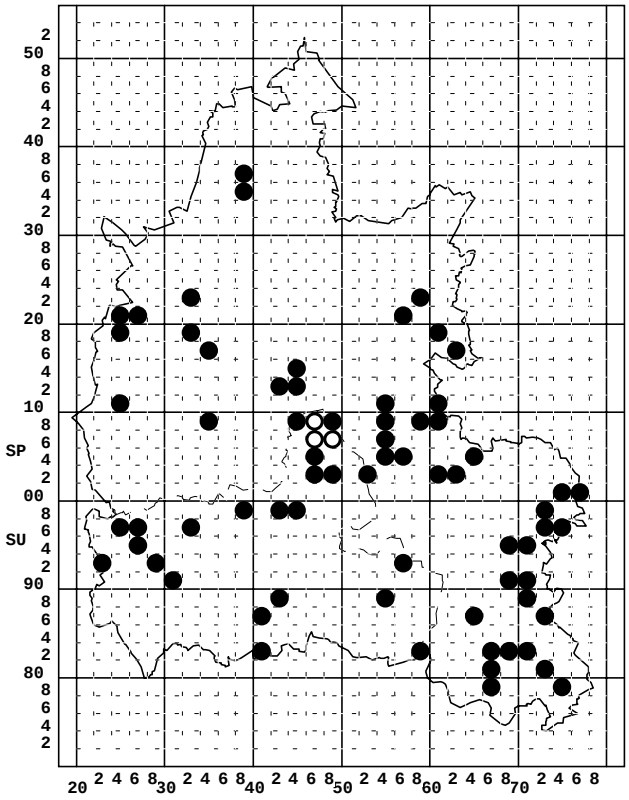


vc.23 only

An uncommon species with a distinct south-easterly bias in the county. All 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 easily be overlooked. An old record from chalk grassland needs confirming and is not mapped.

This species is rarely recorded in Britain. The few records are mainly from urban sites in the south-east.

Geophilus carpophagus Leach, 1814

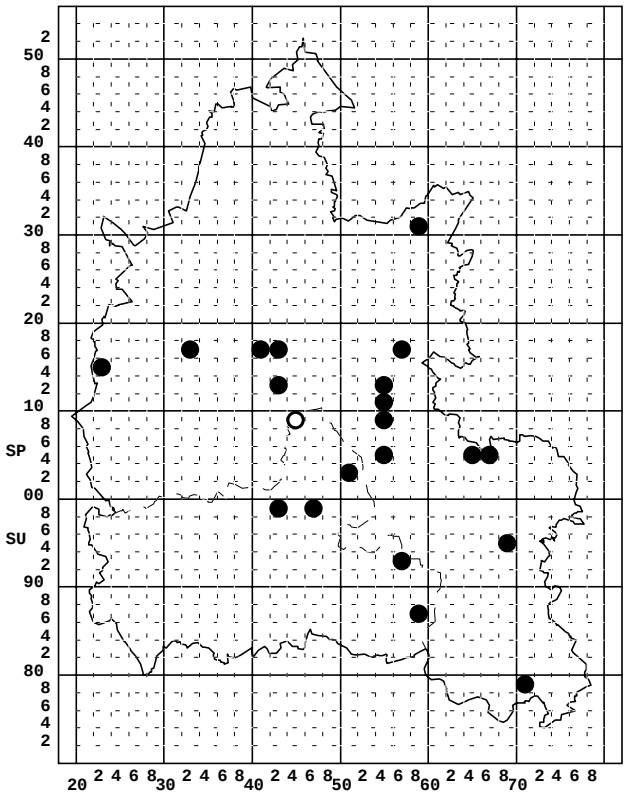


vc.22 & vc.23

This species occurs as two distinct forms. The smaller darker ‘rural form’ is frequent in the county. This is always collected from semi-natural habitats such as relict heathland and acidic ancient woodlands. It occurs at ground level under stones and dead wood. The larger ‘urban form’ has been less widely recorded. This is found in synanthropic sites such as gardens, churchyards and farmyards. Characteristically it has been found above ground, typically under loose bark on trees, especially yew or pine, but also under stones on walls.

This is a common and widespread species in Britain though the precise distribution of the two forms is not adequately known.

Geophilus electricus (Linné, 1758)

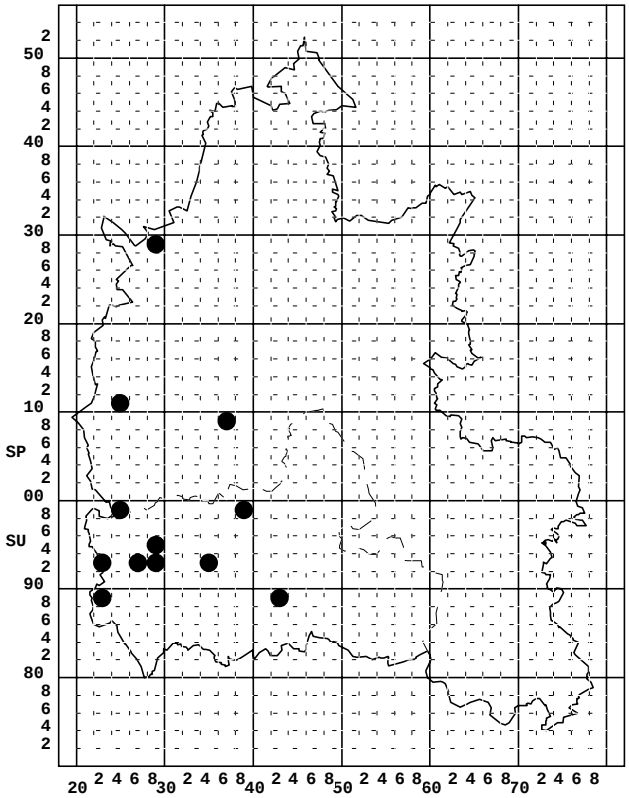


vc.22 & vc.23

An uncommon but widespread species in the county. Most records are from churchyards where it inhabits friable soils, but it has also been found in ancient woodlands and calcareous grasslands. It is similar in appearance to the common *H. subterraneus* and may possibly be overlooked at synanthropic sites.

Though widespread throughout Britain this is an uncommon species often found in gardens.

Geophilus osqidatum Brolemann, 1909

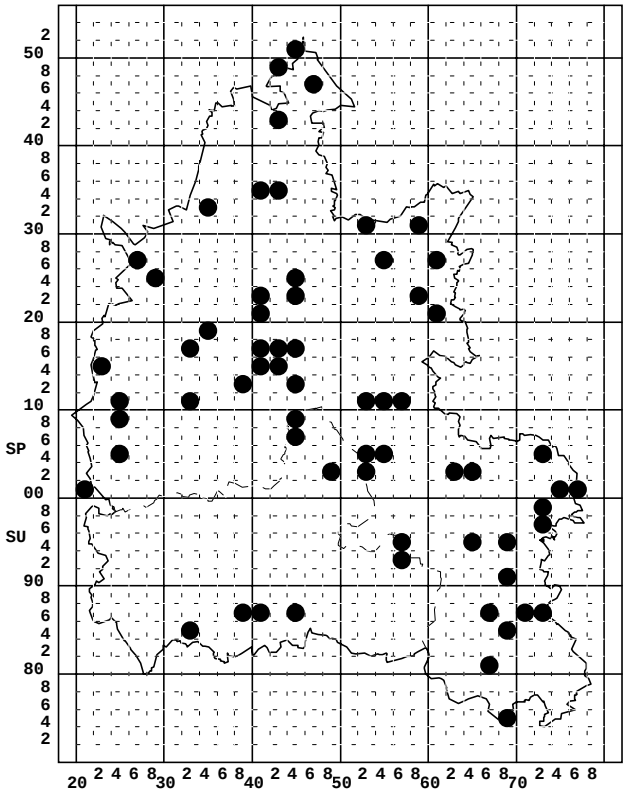


vc.22 & vc.23

In Oxfordshire this species is at the edge of it's British range with records concentrated in the south-west. Most records are from churchyards or gardens where it occurs under stones and amongst soil. Small specimens have proved difficult to separate from the common *N. flavus*.

This species has a markedly south-western distribution in England and Wales where it may be locally common.

Geophilus oligopus (Attems 1885)

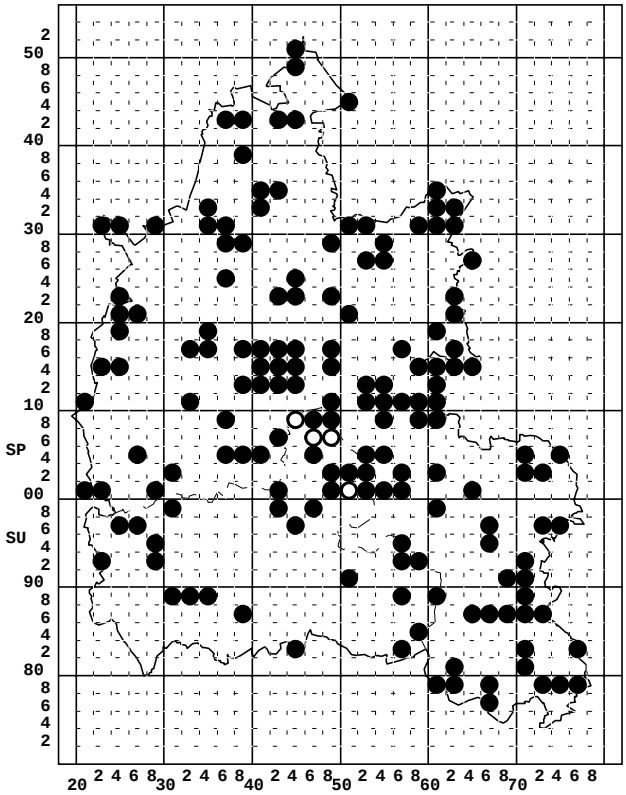


vc.22 & vc.23

Previously known as *G. insculptus* Attems this soil dwelling species is widely recorded from the county. It is typically found under stones in disturbed sites such as churchyards, but less commonly, also in a variety of semi-natural sites. It is much less common in the south west and apparently absent from the Corallian beds.

Nationally a common species, especially in the north and east, found in a variety of habitats.

Necrophloeophagus flavus (De Geer, 1778)

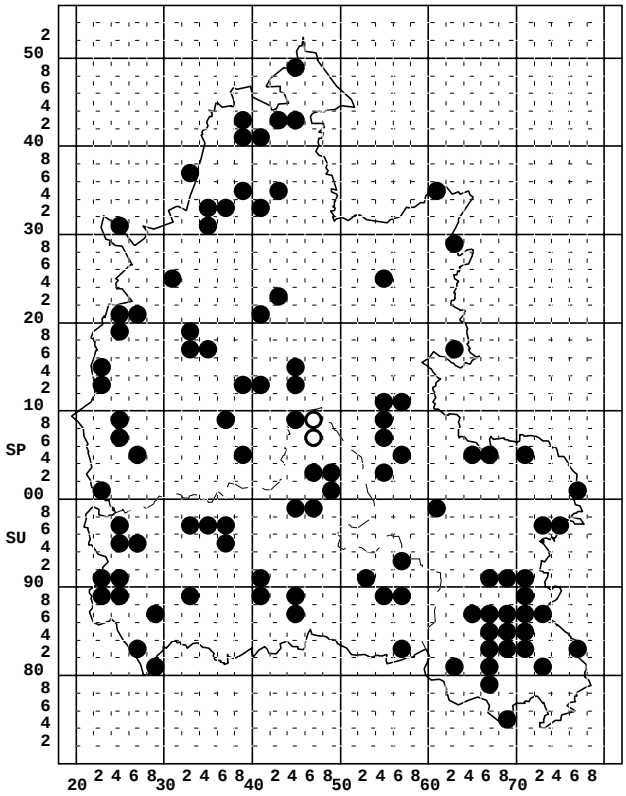


vc.22 & vc.23

This is the commonest of the soil dwelling 'wire' centipedes in the county found under stones and dead wood in a variety of semi-natural and disturbed habitats. In the south-west of the county it has been less widely recorded.

This is a common species throughout Britain, particularly in eastern areas.

Brachygeophilus truncorum (Bergsoë & Meinert, 1866)



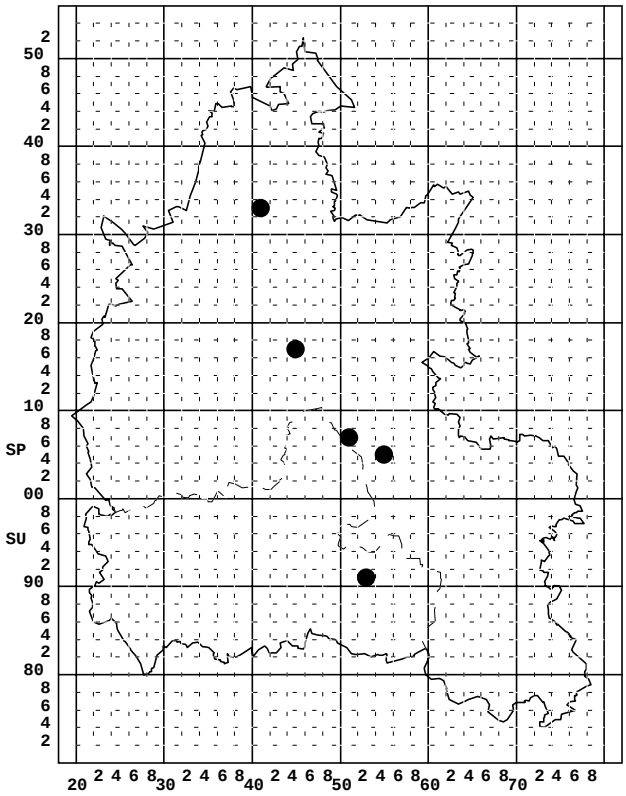
vc.22 & vc.23

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 in damp areas within woodlands or in hedgerow ditches.

It is common throughout Britain in similar habitats but also occupies bracken litter on moorlands.

SCOLOPENDROMORPHA

Cryptops anomalans Newport, 1844

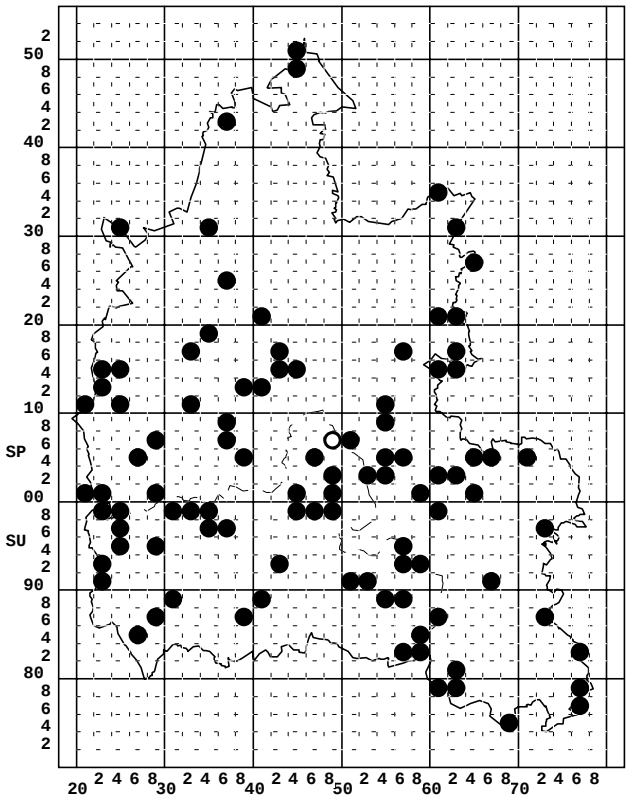


vc.22 & vc.23 Notable

This species is probably genuinely scarce in the county, since when fully grown, it is too conspicuously large to be easily overlooked. When provoked it is capable of inflicting a painful bite, but seldom does. The few records are from urban sites such as churchyards, where it is found underneath large stones.

It occurs in scattered, typically urban, locations in southern England.

Cryptops hortensis Leach, 1814

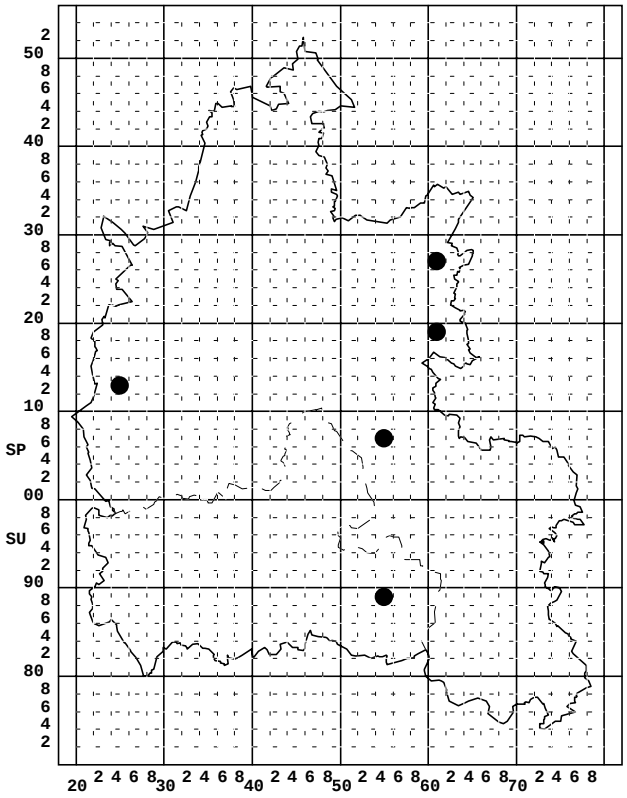


vc.22 & vc.23

Over much of the county this species is common. However it becomes much more local towards the north and appears to be absent from Chiltern Hills in the south east. It is usually found in woodland and gardens, typically under the bark of tree stumps or within compost heaps.

Nationally the only common member of the genus, but becoming more scarce and coastal in the north.

Cryptops parisi Brolemann, 1920



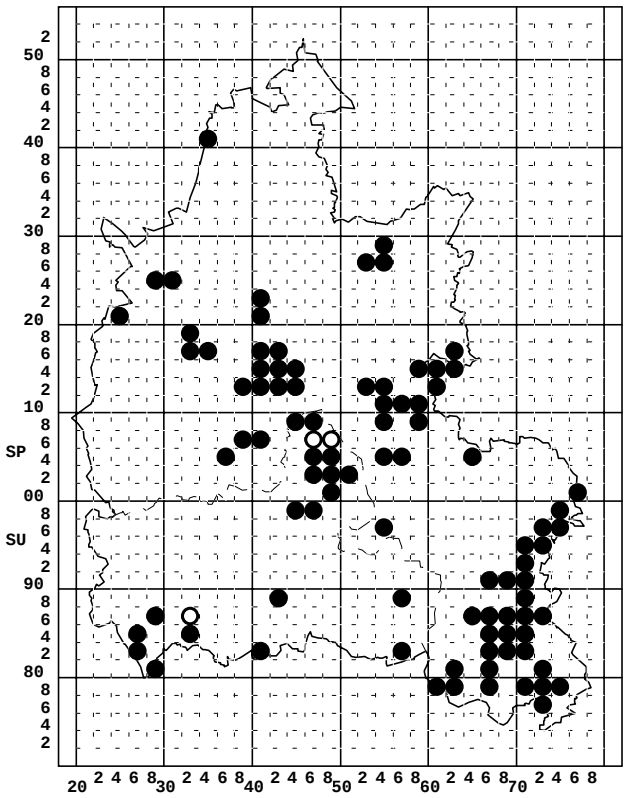
vc.22 & vc.23

Another large scarce species recorded from scattered localities in the county. It is typically found in urban locations beneath large stones or under bark on logs and tree stumps. One record is from a rural woodland, where it was found under the bark of fallen birches. Further woodland sites may occur in the county but it could be easily overlooked as the common *C. hortensis.*

Outside Oxfordshire this species occurs sporadically in southern England, often in urban or coastal areas.

LITHOBIOMORPHA

Lithobius variegatus Leach, 1813

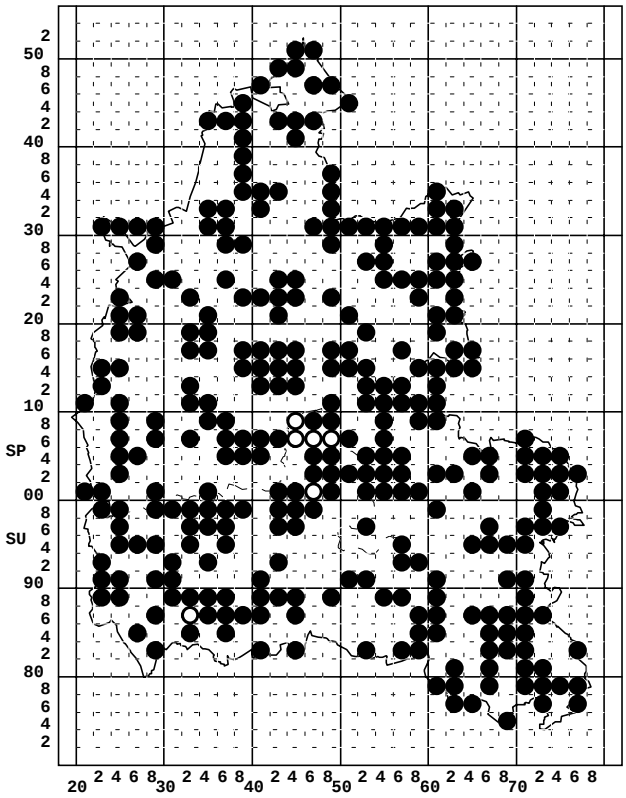


vc.22 & vc.23

This large easily identifiable centipede can be locally abundant in woodlands and scrub on both acidic and calcareous soils associated with the Chiltern chalk, the Corallian beds and the Jurassic oolite. In the clay vales it has proved unexpectedly rare and confined to ancient woodlands.

A common and often abundant species of woodlands and moorlands over most of Britain but it is conspicuously absent from the east of the country.

Lithobius forficatus (Linné, 1758)

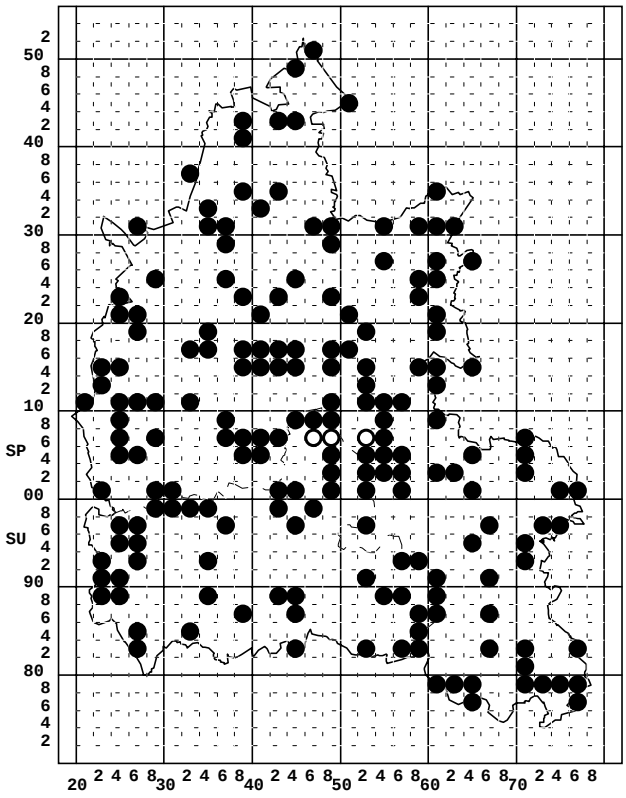


vc.22 & vc.23

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 is readily found under stones and dead wood, it can also be found in most rural habitats, except where *L. variegatus* is common.

A common and often abundant species of urban and rural areas throughout Britain.

Lithobius melanops Newport, 1845

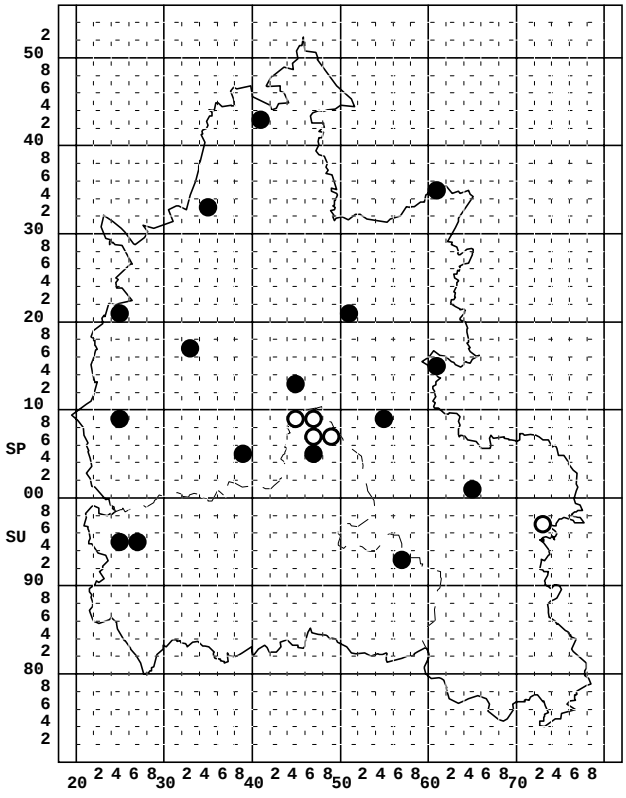


vc.22 & vc.23

A common species 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.

A widespread and common species in Britain characteristic of urban and coastal areas.

Lithobius macilentus L.Koch, 1862

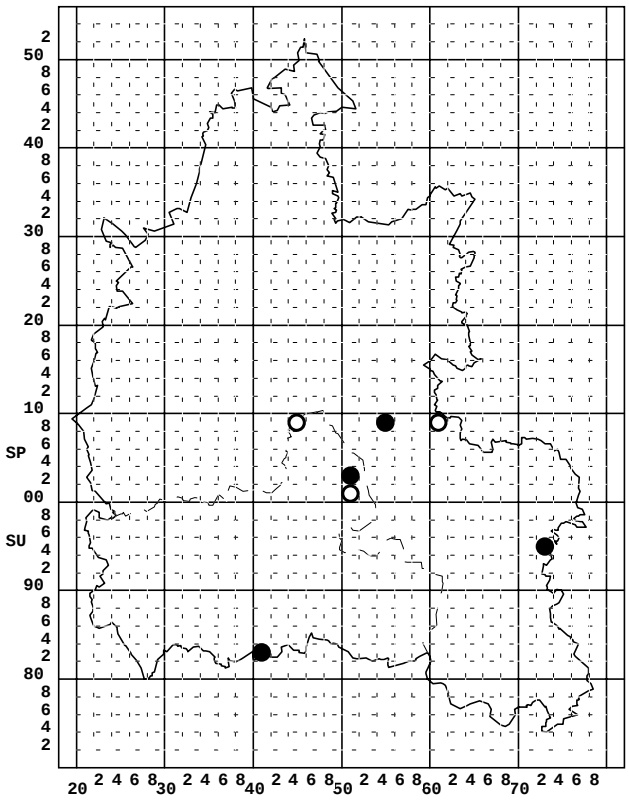


vc.22 & vc.23

This small Lithobiid has proved widespread throughout the county but is never numerous. Typically one or two specimens are found amongst deep accumulations of leaf and twig litter within deciduous woodland. It is possibly under-recorded.

Nationally a local but widespread species with a strong preference for rural sites.

Lithobius borealis Meinert, 1868

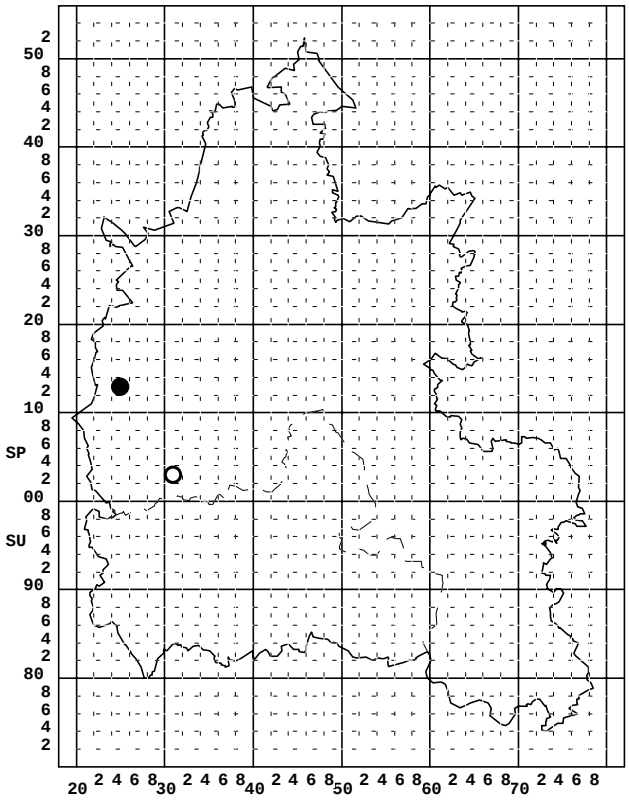


vc.22 & vc.23

A rare species recorded from a handful of deciduous woodlands on acidic or sandy soils. It was collected from several sites by the Wytham Survey, the earliest being Bagley Wood near Oxford in 1933. It was refound there sixty years later in 1993 and it may also still occur at the other old sites. However the predominance of old records suggests that the species may have decreased in abundance within the county in recent years.

Nationally this is a local, but widespread, rural species more characteristic of heathland and upland moorland.

Lithobius pilicornis Newport, 1844

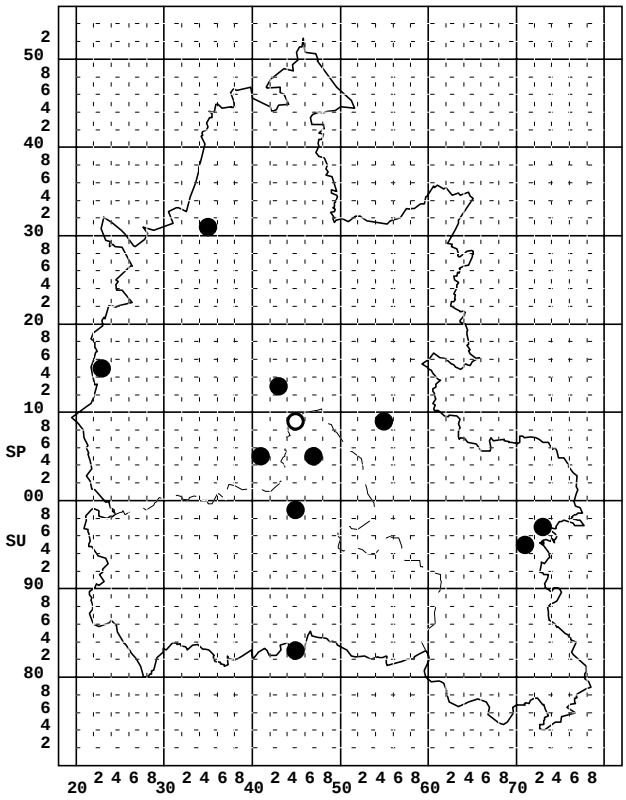


vc.23 only Notable

This large species is a recent addition to the county list. Since 1993 it has been collected from a churchyard in the west of the county on several occasions. It is not unlike *L. forficatus* in general appearance and seems to have replaced this species at the site. It has probably been introduced here and may occur at other urban sites in the county. There is an old record for 'Bampton' but further details are not known.

This uncommon species is typically found in urban sites near the coast mainly in south-west England.

Lithobius calcaratus C.L.Koch, 1844

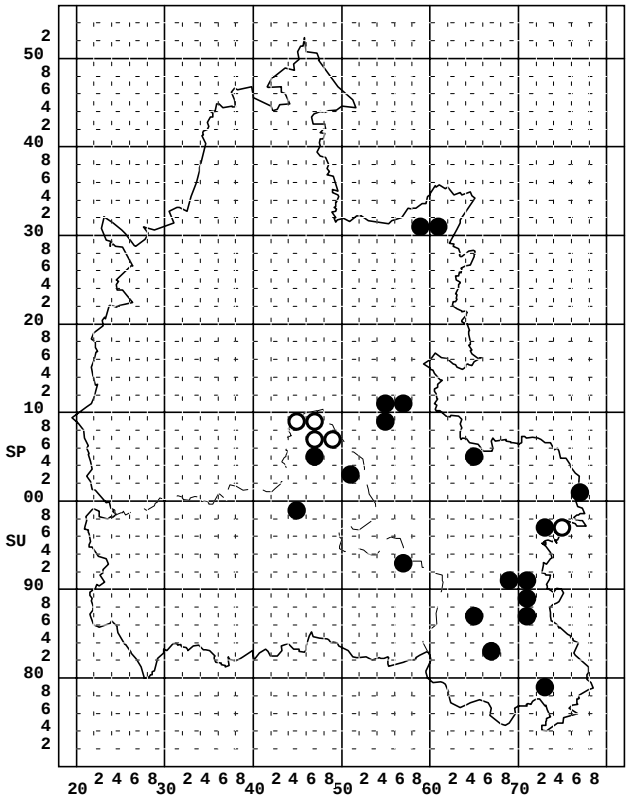


22 & vc.23

This uncommon species is found in dry open semi-natural sites such as grassy heaths on the Corallian sands and calcareous grasslands on the oolites and chalk. It has also been collected from a disused gravel-pit in the Windrush valley. It seems to be rather elusive and may prove to be under-recorded.

This local species is characteristic of heathland and dry grassland throughout Britain.

Lithobius muticus C.L.Koch, 1847

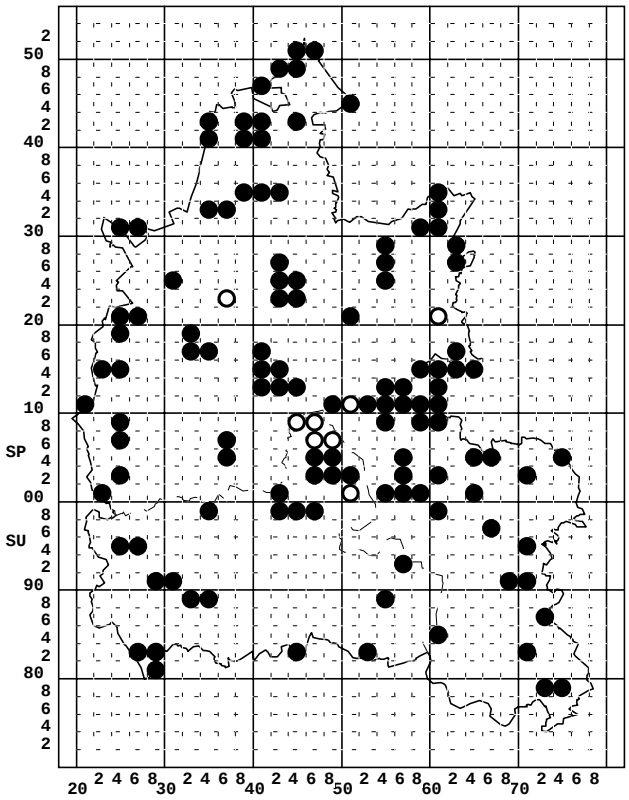


vc.22 & vc.23 Notable

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 ancient deciduous woodlands, wherever a well developed litter layer is present. It has also been collected from calcareous grasslands where these adjoin woodlands. Isolated records occur elsewhere most notably near Cottisford in the north of the county.

Nationally this species shows a markedly south-eastern distribution and can be locally common in deciduous woodlands.

Lithobius crassipes L.Koch, 1862

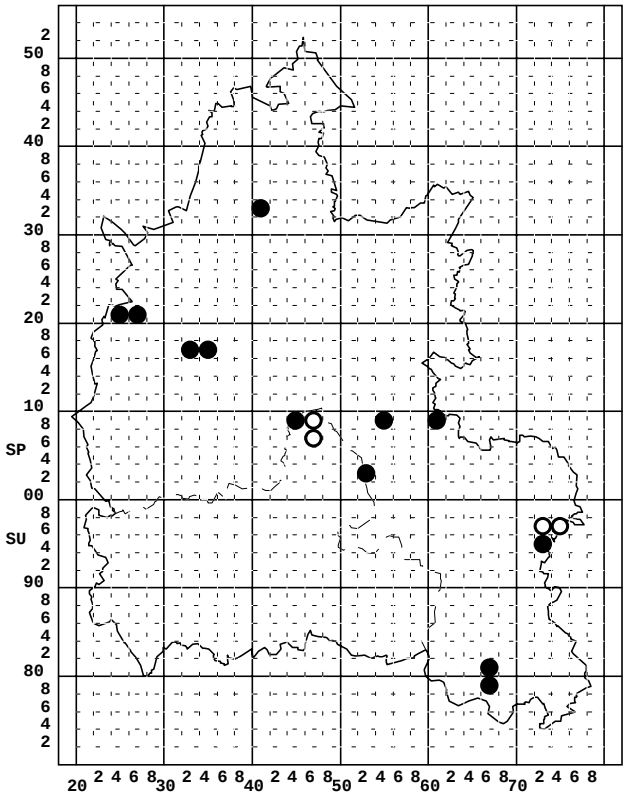


vc.22 & vc.23

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. It seems to be less common in the south of the county despite much apparently suitable habitat.

This is a common and often abundant species, especially in north-western Britain, typically found in rural areas.

Lithobius curtipes C.L.Koch, 1847

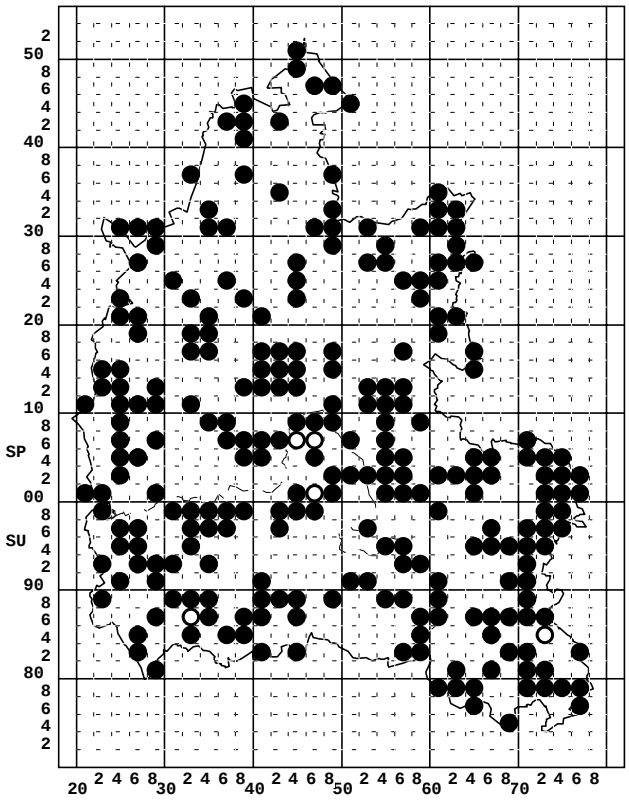


vc.22 & vc.23

A widespread, but elusive, species associated with ancient deciduous woodland. It is apparently scarce in the county but even at known sites it is rarely encountered and it may prove more widespread. It is typically collected from amongst leaf-litter or moss and has been hand sorted from a grass tussock in mid-winter.

A widespread but uncommon species in England and Wales characteristic of ancient deciduous woodland and possibly in decline.

Lithobius microps Meinert, 1868

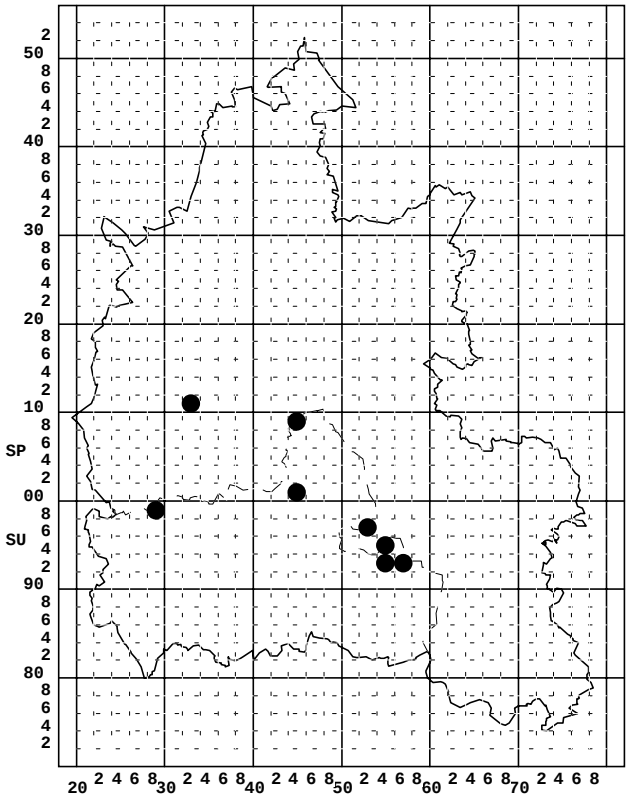


vc.22 & vc.23

This is probably the commonest centipede in county though its small size and subterranean habits do not assist collection. It is often numerous at synanthropic sites, under stones or within soil. In semi-natural habitats, such as woodlands and river-side meadows it occurs less abundantly.

A widespread and common species, especially in England and Wales and often in urban sites.

Lamyctes fulvicornis Meinert, 1868

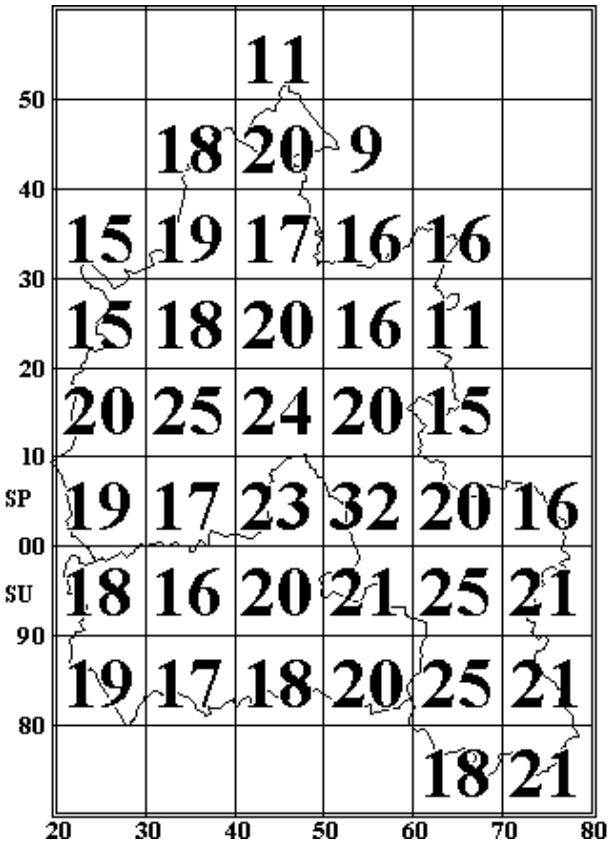


vc.22 & vc.23

An apparently scarce species not recorded in the county until 1992. Most records are from riverside locations (Thames and Windrush), including meadows and disused gravel-pits. It has also been pitfall trapped from an arable field and a sand-pit on the Corallian ridge. The few records are from late-June until late- September, when collector activity is usually minimal. A specific search at this time of year may prove the species to be much more widespread.

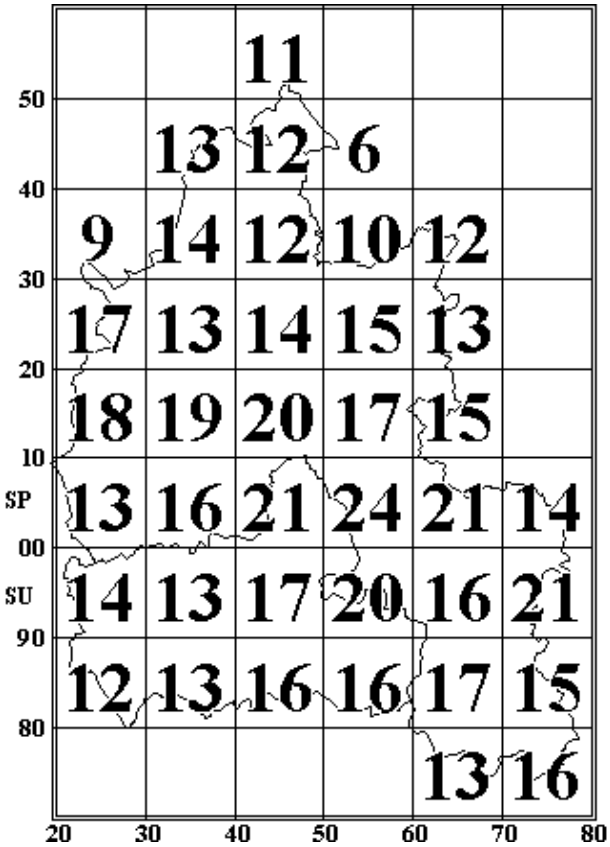
Unusually for a centipede this local but widespread species is highly seasonal with most records for the autumn months, mainly from rural sites.

10KM GRID SQUARE SUMMARIES



MILLIPEDES

The number of species of millipede recorded from each 10 km grid square is indicated. There is a general decline in species richness towards the north of the county perhaps reflecting the limited availability of habitats in this part of the county. However the chalk in the extreme south-east and the southern edge of the oolite does appear to be particularly rich in species.



CENTIPEDES

The number of species of centipede recorded from each 10 km grid square is indicated. The coverage is more uniform than seen for millipedes perhaps because centipedes are less dependent on calcareous soils.