Bulletin of the British Myriapod Group 3 (1986)

GEOPHILUS PROXIMUS C.L. KOCH (CHILOPODA, GEOPHILOMORPHA) AND OTHER CHILOPODA FROM THE SHETLAND ISLANDS

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No published records of myriapoda exist for the Shetland Islands although Hammer and Henriksen (1930) reported four species from the Faeroes. Two species of diplopod, Cylindroiulus latestriatus (Curtis) and Proteroiulus fuscus (Am Stein) are known from Shetland (C.P. Fairhurst, Myriapod Survey Scheme, unpub.) and nine chilopods are here recorded including one, Geophilus proximus C.L. Koch apparently new to the British Isles.

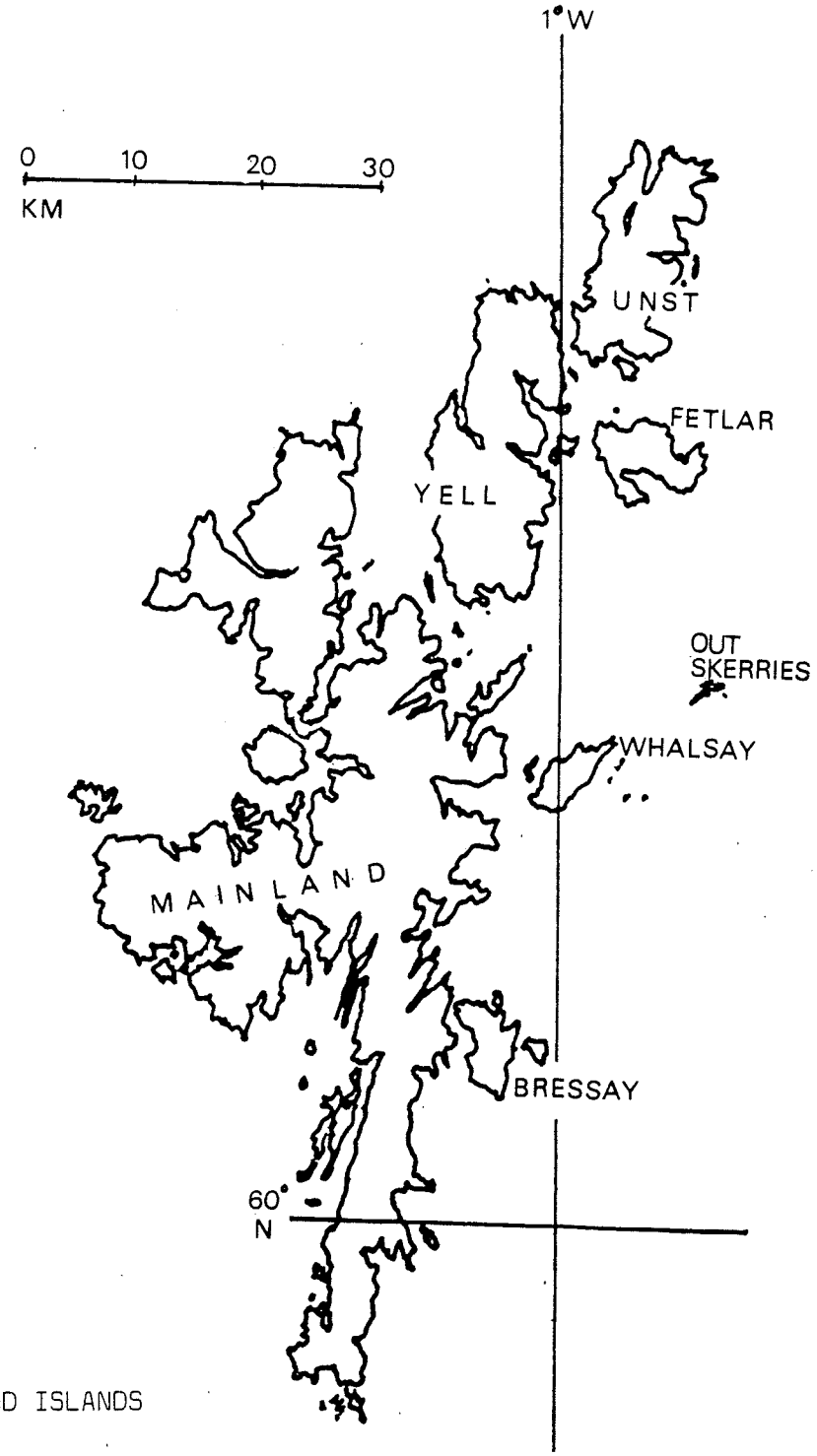
The Shetlands are an archipeligo of islets and islands, over 100 in number lying between 50°50' and 60°52'N and 0°55' and 2°14'W. The principal island is Mainland; Yell, Unst and Fetlar lie to the North, Whalsay and Bressay to the East and Muckle Roe and Foula to the West (Map 1). The coast of the islands is extensively dissected and no part of the area is more than about 5 km from the sea. The surface cover is largely moorland and peat rising to 450 m at the highest point.

Collections were made in 1974 by two groups. A team from Merlewood Research Station, Grange over Sands, collected animals as part of a broad ecological survey of the islands (indicated M) and Dr. N.P. Ashmole of Edinburgh University (indicated A) obtained further specimens. Approximately 90 animals in total were collected but some were unidentifiable due to damage or to an immature state. Collections were made on Mainland (M, A), Yell (M), Unst (M, A), Bressay (M) and Fetlar (A) and from the Out Skerries (Housay, Grunay and Bruray Islands, M). There is also a single record of Strigamia maritima (Leach) from Mainland made in 1977 by M. Jones.

Seven species are recorded from Mainland and from Unst, one from Bressay, three from Fetlar and two from Out Skerries. The only specimen from Yell was an immature, probably Lithobius borealis Meinert (det. E.H. Eason). The distribution by islands is given in Table 1. 10 km National grid squares are given for each species.

SPECIES	Mainland	Unst	Bressay	Fetlar	Yell	Out Skerries		
						Grunay	Bruray	Housay
Schendyla nemorensis	X	X				X	X	
Strigamia maritima	X							
Geophilus proximus		X						
Geophilus insculptus		X						
Brachygeophilus truncorum	X			X				
Lithobius forficatus	X	X				X	X	X
Lithobius melanops	X	X		X		?		
Lithobius borealis	X	X	X	X	?			
Lamyetes fulvicornis	X	X						

TABLE 1. SPECIES RECORDED FROM VARIOUS ISLANDS



MAP 1: THE SHETLAND ISLANDS

SPECIES RECORDED

Order GEOPHILOMORPHA

Schendyla nemorensis C.L. Koch

Specimens of this small geophilomorph are recorded from Usta Ness, under stones on limestone grassland (24.7.74, M), Bruray, maritime grassland (11.9.74, M), Grunay, under stones in short grass turf (8.9.74, coll. G. Durrant, M), Haroldswick, recently disused serpentine quarry, 3 specimens (19.8.74, M).

10 km records: HP61, HU48, 67

Strigamia maritima (Leach)

Records of this common littoral centipede are from North Voe of Clousta, large numbers along shore of brackish lagoon (3.7.74, M), Whiteness Voe, high on shore in Xanthoria zone (9.8.74, M) and from the same general area (M. Jones, 8.77).

10 km records: HU34, 35

Geophilus proximus C.L. Koch

A single female with 49 pairs of legs is recorded from near Queyhouse, Unst (HP 602113) under boulders in bottom of nettle-grown hollow in a limestone hillock covered in closely grazed turf, close to the shore of the freshwater Loch of Cliff; sheep bones were piled in amongst the turf (20.8.74, M).

10 km record: HP 61

Geophilus insculptus Attems

A species widespread in Britain, this is represented by specimens from Halligarth near Baltasound, Unst in a small sycamore (Acer pseudoplatanus L.) wood, one of the few woods on Shetland. It is a small walled enclosure with trees over 100 years old, a closed canopy 5-8 m up and with bare, crumbly, loose soil beneath (11.7.74, A; 26.8.74, M).

10 km record: HP 60

Brachygeophilus truncorum (Bergsø & Meinert)

A small species collected from two sites; soil from sheep grazed grassland near Brindister (19.7.74, M) and rocky moor, Rooin Hill, Fetlar (25.6.74, A).

10 km records: HU 25, 69

Order LITHOBIOMORPHA

Lithobius forficatus (L.)

One of the commonest centipedes over most of Britain, some 14 specimens are recorded in total; Calluna hillside, storm beach, near derelict croft, old woodpile, quarry, roadside, etc.

10 km records: HP 44, 46, 50, 61, 67
HU 25, 35

Lithobius melanops Newport

A species usually separated from the next by the presence of broad posterior projections on tergite 9 and the absence of the additional prefemoral spine of the 15th legs, it is nevertheless separated from it with great difficulty in some Shetland specimens. Thanks to the work of Dr. E.H. Eason it has been possible to assign names to most specimens of these two species.

Definite records are from North Voe of Clousta (two males, 3.7.74, M) - a steep hillside facing south covered with a close turf composed almost entirely of Calluna and a very dry, thin soil; Sandwick, Unst (7 specimens in all, males and females, 19.8.74, M) - under stones and old wood behind a sandy foreshore; Halligarth (one male, 11.7.74, A) - sycamore wood; Quendale (one female, 2.7.74, A) - calcareous sand dunes with marram grass; Fetlar (one male), rocky moor.

A male, only 8.5 mm long, almost adult with 9 setae on each side of the first genital sternite, well developed tergite 9 and no supplementary spine on the last legs was collected on the surface of ground near occupied buildings at Brindister (3.4.74, M) and is presumably this species, another male from Grunay, under rocks embedded in short turf, (8.9.74, M) is possibly this species and an immature female from Sandness Hill (30.6.74, A) is rather large for L. borealis and could be this species.

10 km records: HP 60 HU 31, 35, 69

Lithobius borealis Meinert

Shetland specimens of this species tend to show distinct broad projections on tergite 9 although these are not necessarily as large as those on the preceding species. A similar phenomenon has been observed in animals from Sutherland (E.H. Eason, pers. comm.). This leaves the accessory spine on the 15th legs as the distinguishing character; damaged or immature animals may be impossible to diagnose with certainty.

The species seems to be widespread in Shetland with records from Keen of Hamar, Unst (11-13.7.74, A), Nikka Vord, Unst (12.7.74, A), Noup of Noss (24.6.74, A), North Roe (17.7.74, A), Fetlar (22.7.74, A), Rooin Hill, Fetlar (24.7.74, A), Bressay (28.6.74, M), near Brindister (2.7.74, M), near Stockhoul, Unst (18.8.74, M), Haroldswick, Unst (25.8.74, M). Most of the records are associated with peat moorland.

A possible specimen of this species is from Yell (14.8.74, M), a second instar larva.

10 km records: HP 51, 60, 61
HU 38, 53, 69

Lamyctes fulvicornis Meinert

11 specimens of this species are recorded, all from Mainland or Unst; Lochend (in public hall, 11.7.74, A), Hill of Colvadale (heath, 12.7.74, A), Brindister (loose stones in dry seepage area, 30.6.74, M), near Gonfirth (Calluna heath, peat, 13.8.74, M), near Stockhoull, Unst (peat gully, 18.8.74, M), near Queyhouse, Unst (almost bare serpentine area, 20.8.74, M), Haroldswick, Unst (wet hillside, sparse grass, 25.8.74, M), near Lunna (roadside, Calluna heathland, 2.8.74, M), Lock of Cliff (damp ground, beach, 22.8.74, M).

10 km records: HP 51, 60, 61
HU 25, 36, 38, 46

DISCUSSION

1. GEOPHILUS PROXIMUS

A number of older British workers refer to this species (e.g. Evans, 1907, Johnson, 1912) and Schubart (1963) quotes Scotland for it but Eason (1964) considers that all old British records should in fact be referred to G. insculptus. The animal from Unst would therefore seem to represent the first British record of this species.

The animal has certain similarities with other geophilids, notably G. insculptus and G. fucorum Brolemann but is distinguished from the latter by the smooth poison claw, the smaller number of trunk segments and the larger terminal claws on the last legs. In addition G. fucorum would appear to be entirely littoral in Britain.

The similarities with G. insculptus are more marked, in particular the general appearance, the number of trunk segments and the large carpophagous fossa and the two have been much confused (Meidell, 1969). The differences are however fairly clear, notably the presence of a normal claw rather than a peg on the second maxillae and the absence of a single isolated coxal pore on the terminal legs. Diagrams of these two features are given by Enghoff (1971). In addition, the pore area on the sternites is described as diamond shaped and the mid-piece of the labrum as having a single tooth (Brolemann, 1930). On the Shetland specimen, the pore areas vary somewhat on different sternites; some might be described as spindle shaped rather than diamond but they are ill-defined. The labral mid-piece is difficult to distinguish; there are three teeth centrally but is not easy to determine whether the lateral ones arise from the side pieces; one of them bears a definite fimbria. The fimbriae on the side pieces resemble Brolemann's description clearly, broad at the base and contracted sharply mid way (op.cit. fig. 240).

Brolemann quotes the species as "France septentrionale (trouve en Seine-Inferieure par M.H. Gadeau de Kerville). Europe septentrionale." but his drawings are after Chalande of a specimen from Brandenburg. Demange (1981) seems to repeat the information "France septentrionale; Seine-Maritime".

There are numerous records from Nothern Europe; Denmark (Enghoff, 1971, 1983), Norway (Meidell, 1969), Sweden (Lohmander, quoted in Meidell), Easter Fennoscandia (Palmen, 1948), Eastern Baltic (Trauberg, quoted in Palmen), North Germany (Verhoeff, quoted in Meidell). It is also reported from Hungary and Romania? (Schubart, 1963) and from two areas in the Netherlands (Jeekel, 1977). Its occurrence in Shetland fits in with a northerly distribution.

Both Enghoff and Meidell refer to the synanthropic tendencies of G. insculptus compared to G. proximus. G. insculptus is certainly not restricted to synanthropic sites in most of Britain where it is widespread but is interesting that the known Shetland site is an enclosed woodland near a settlement. Possibly the two species compete with G. insculptus being the southern, G. proximus the northern forms; the occurrence of southern species in synanthropic sites has been remarked elsewhere (Barber, 1985) and Meidell (1979) comments on the fact that the great area convered by G. proximus might possibly be explained as a combination of great vagility and parthenogenetic reproduction.

2. OTHER SPECIES

Clearly the limited amount of material available means that almost certainly some species may have been missed accidentally but the absences from the list are themselves of interest. Apart from generally southern species such as Haplophilus subterraneus (Shaw), Cryptops spp. and Lithobius microps Meinert the most obvious absences are of the widespread British species Lithobius crassipes L. Koch and Lithobius variegatus Leach, both of which are common animals in open country in much of mainland Britain (other than the eastern areas in the case of the latter species).

Meidell (1979) lists the Norwegian chilopods according to their distribution and it is interesting to compare his data with ou Shetland records (Table 2). Of the species he considers as indigenous to Norway, Pachymerium ferrugineum C.L. Koch has been once recorded from southern Britain, possibly a chance introduction and not from western Norway. Lithobius erythrocephalus C.L. Koch and L. tenebrosus fennoscandius Lohmander are not reliably known from Britain and are very rare in western Norway. L. curtipes C.L. Koch is known from scattered English

SPECIES	W. Norway	Rest of Norway	Indigenous/ Anthropochorous	Shetland Islands	Mainland Scotland
Haplophilus subterraneus					+
Schendyla nemorensis	X	X	I	+	+
Strigamia crassipes		(x)	A?		+
S. maritima	X	(x)	I	+	+
Pachymerium ferrugineum		X	I		
Geophilus carpophagus		(x)	A		+
G. electricus	(x)	x	(A)		+
G. proximus	X	X	I	+	
G. insculptus	(x)		(A)	+	+
Necrophloeophagus longicornis	X	X	A		+
Brachygeophilus truncorum	X	(x)	I	+	+
Cryptops hortensis		(x)	A		+
Lithobius variegatus					+
L. forficatus	X	X	I	+	+
L. melanops	X	X	I	+	+
L. erythrocephalus	(x)	x	I		
L. borealis	(x)	x	I	+	+
L. macilentus	(x)	(x)	AI		+
L. tenebrosus	(x)	(x)	I		
L. calcaratus					+
L. crassipes		(x)	(A)		+
L. curtipes	(x)	X	I		
L. microps	(x)	(x)	A		+
Lamyctes fulvicornis	X	X	I	+	+

TABLE 2. SHETLAND AND NORWEGIAN SPECIES
(Modified after Meidell, 1979)

X = common x = rare (x) = very rare + = recorded I = indigenous
A = anthropochorous (in Norway)

records but not from Scotland, it is very rare in western Norway and appears to be largely eastern in Denmark (Enghoff, 1983). L. macilentus C.L. Koch (very rare in Norway) is known from scattered sites over much of Britain.

Nerophloeophagus longicornis (Leach) is a widespread and frequent animal in Britain and might be expected to occur in Shetland but, excluding Strigamia maritima a total of only ten identifiable geophilomorphs were collected so its absence from our records may be due to chance.

CONCLUSIONS

Overall the Shetlands fauna would appear to consist of Lithobius forficatus as the large lithobiid, frequently associated with human activity, L. melanops apparently also at least in part synanthropic, L. borealis as the common open country species (rather than L. crassipes) together with Lamyctes fulvicornis a species widespread in Northern Europe. Geophilomorphs, because of the small number collected, cannot be quite so easily fitted into a general pattern but Geophilus proximus would seem a distinctly northern element in the fauna.

Clearly further collecting could yield other species, possibly some of those referred to above and it would be most useful to have further collections made in Shetland, Orkney and North-East Scotland.

ACKNOWLEDGEMENTS

Thanks are due to Dr. J. Darlington (I.T.E., Merlewood Research Station) and to Dr. N.P. Ashmole for the collections made, also to Dr. E.H. Eason for much patience in his examination of Lithobius melanops/borealis specimens, his comments and his confirmation of Geophilus proximus and to Dr. H. Enghoff of Copenhagen for the loan of a specimen of that species.

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