

Re-discovery of *Geophilus proximus* C.L.Koch, 1847 in Shetland (Chilopoda: Geophilomorpha, Geophilidae)

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Abstract

The only confirmed record of *Geophilus proximus* C. L. Koch, 1847 in Britain refers to a single specimen collected from Unst, Shetland in 1974. Here we report the rediscovery of this species, close to the original find site almost 50 years later. Several specimens, all female, were collected on three separate occasions suggesting that it is well established at the site. It may prove to be more widespread in Unst, or even elsewhere in northern Scotland.

Introduction

In Britain and Ireland many older references to '*Geophilus proximus*' have been shown to refer to *Geophilus impressus* C. L. Koch, 1847 (formerly known as *G. insculptus* Attems, 1895 and more recently as *G. alpinus* Meinert, 1870) and it is quite probable that all older records do so (Eason, 1964; Barber, 1986; Barber & Jones, 1999). The only confirmed record of the true *Geophilus proximus* C. L. Koch, 1847 was of a single female specimen, with 49 leg pairs, collected from near Queyhouse, Unst, Shetland (HP602113) in August 1974 by a team from ITE, Merlewood Research Station (Barber, 1986). This is the first, and only, British record for this centipede. This specimen was collected from beneath boulders in the bottom of a nettle-filled hollow in a limestone hillock covered in closely grazed turf, near the shore of the freshwater Loch of Cliff, Unst, Shetland. This archipelago of islands lies some 170 km north east of the Scottish mainland and 300 km west of Norway.

Geophilus proximus is a widespread Scandinavian centipede (Andersson *et al.*, 2005) where it may be the most frequently encountered geophilomorph centipede found in all types of forest and in open land. A description of *G. proximus*, based on Norwegian material, is given by Barber & Jones (1999) and this information is included within the identification keys by Barber (2008; 2009). There had been no subsequent records of *G. proximus* from Shetland and Lee (2015) raised the possibility that it may be regionally extinct, but also acknowledged that few myriapodologists visit the Northern Isles. Thus, there is a high probability that it may be under recorded there and Lee (2015) designated it Nationally Rare, but Data Deficient.

Here we report the re-discovery of *Geophilus proximus* on Shetland after almost half a century.

The rediscovery

On 18th July 2021 KL and MP, accompanied by their respective wives, visited the limestone outcrop near the shore of Loch of Cliff, Unst, Shetland (c. HP601108), about 400 m south of the original 1974 site (Fig. 1A-D). Upon reaching the limestone area and passing through a gap in a stone wall some of the scattered stones were turned to reveal that the soil seemed finer and more friable than in other areas examined on route. Due to the recent dry weather the soil beneath the stones had cracked and MP saw an unrecognised beetle (Coleoptera) disappear down a crack. During an attempt to dig it out with a widger a small pale centipede was seen in the excavated soil. In light of this discovery, additional large partly embedded stones were turned over and the soil underneath then carefully dug over. This method turned up three specimens; two juveniles (including the first specimen found) and one adult female.



Figure 1: The survey area near the shore of Loch of Cliff, Unst.

A) Gap in dry stone wall with the loch in background; B) The limestone outcrop; C) MP hand searching; D) The stone beside wall where the first adult was found. Images © Keith Lugg.

The adult (Fig. 2A & 3A-D) is 24 mm in length, bears 49 leg pairs and readily keyed to *Geophilus proximus* using Barber (2009); an identification confirmed by Tony Barber from images. All the mentioned identification characters (Barber, 2009) for *G. proximus* were present (Fig. 2) including the second maxillae bearing a distinct claw (Fig. 2B; absent in *G. impressus*), the absence of an isolated coxal pore on the last trunk segment (Fig. 2D; present in *G. impressus*) and the sternal pore areas being diamond shaped (spindle shaped in *G. impressus*).

A return visit to the same location to take some site photographs and to begin to assess the range of the population one week later, on 25th July, resulted in four more adult specimens being found, all from under stones at the base of limestone walls. No specimens were found outside of the area of limestone, including a brief search of an abandoned croft, though further fieldwork is needed. Another return visit to the same location on 6th October 2021, in the company of Kevin Clements, resulted in the collection of three additional specimens from beneath stones fallen from adjacent limestone walls in just under three hours' searching. Searches were not undertaken away from the limestone walls.

Other species recorded during the three surveys include the centipedes *Lithobius forficatus* (Linné) and *L. melanops* Newport; the millipedes *Brachydesmus superus* Latzel and *Cylindroiulus latestriatus* (Curtis); and the woodlice *Trichoniscoides saeroeensis* Lohmander, *Oniscus asellus* Linné and *Porcellio scaber* Latreille.



Figure 2: *Geophilus proximus*, live females from Unst.

A) Specimen collected 18th July 2021; B) Specimen collected 25th July 2021. Images © Keith Lugg.

Discussion

After an absence of almost 50 years *G. proximus* has been re-discovered in Britain within a few hundred metres of the original 1974 record. It is of note that the species was readily found on the first attempt in less than ideal conditions in July, being abnormally dry for Shetland with very little precipitation since January and February, and again during the return visits to the same spot later in July and the following October. Given the long time period between the original record and its re-discovery it does seem to be well established in the area. The lack of records during the intervening decades are most likely due to under-recording on Shetland and it may prove to be more widespread on Unst, but the outcrops of limestone are limited in extent.

The original 1974 record was of a single female specimen and all six adult specimens collected and examined by KL also proved to be female. Only females have been recorded from the Nordic Countries (Barber & Jones, 1999) and it is quite likely that *G. proximus* is parthenogenetic in Unst as it is in the Nordic Countries. The current rural nature of the sites suggest that it may be a native species, but in the past there has been more human influence on the area, for examples with a near-by (now abandoned) croft and an old limekiln. Historically Shetland was under the control and influence of Norway for a long period of time. Thus, it is possible that *G. proximus* may have been accidentally transported to Unst from Norway and its parthenogenetic habits facilitating its establishment. It is possible that it may be



Figure 3: *Geophilus proximus* specimen from Unst, collected 18th July 2021.

A) Head, ventral view (note distinct claw on second maxilla, arrowed); B) Close up of second maxilla showing distinct claw; C) Carpophagus fossae on anterior sternites; D) Coxal pores (note absence of isolated pore). Images © Keith Lugg.

found in other similar habitats on Orkney or on the northern Scottish mainland and, if so, additional information on its habitat preferences (e.g. whether it favours synanthropic or semi-natural sites) would help clarify the status of this rare centipede in the UK.

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