SOME OBSERVATIONS ON THE ECOLOGY OF *LEPTOIULUS BELGICUS* (LATZEL) (DIPLOPODA, JULIDAE)

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INTRODUCTION

When *Leptoiulus belgicus* was first collected in the British Isles it was found in bracken and conifer needle litter (Bagnall, 1922). Lee (2006) comments that habitat analysis of the Millipede Recording Scheme data for *L. belgicus* provides no evidence of a preference for particular soil types in Britain, other than a strong association with coastal sites. He suggests that this association may be due to the warmer microclimates in these areas. He adds that Kime (2004) associated it with warm positions on light, well-drained soils, whereas Morgan (1988) linked it with synanthropic habitats in south-west Wales. Berg *et al*. (2008), in their work on the Dutch fauna, also report *L. belgicus* to be associated with warm, dry conditions on free draining soils but do not consider it to be a synanthropic animal. They note a preference for relatively open habitats including scrub and young woodland on calcareous soils. Hopkin & Read (1992) present data from a pitfall trapping study of millipedes in Germany (Dunger & Steinmetzger, 1981) which shows an association between *L. belgicus* and areas of dry grassland and scrub, as opposed to a wide range of other situations such as water meadow, arable, pine forest and beech woodland – the associations were related to humidity and pH as well as vegetation type. The *L. belgicus* were found in the upper areas of an altitudinal succession from a stream and water meadows through grassland and scrub on the lower slopes, to pine and beech which dominated the highest levels. This is the only mention of *L. belgicus* anywhere in Hopkin & Read (*loc. cit*.) which provides further indication of the limited knowledge of this species in Britain. A project undertaken in September 2013 in West Cornwall (VC 1) provides an opportunity for further development of our knowledge of the habitat associations of this species. Fortunately the project timing coincided with the peak in activity when the millipedes are mature.

METHODS

Standardised sampling of the terrestrial invertebrates was carried out across 42 locations on 14 moorland sites covering the length of the West Penwith Moors, from west to east (hectads SW32 & 43). This area comprises old rough pasture land on Granite geology, with acid grassland, heath and scrub developed on mineral soils, and wet heath and mire on peat soils. It is effectively a small-scale version of the better known Bodmin Moor and Dartmoor. Active management largely ceased over 50 years previously but the moors are regularly burned to control coarse vegetation, and grazing has been restored to selected areas in recent years. Four sampling methods were used: pitfall trapping, suction sampling, sweep-netting and beating. The altitude of the sites was in the range of 150-225m. KA carried out the sampling while PL dealt with identification of the non-insect arthropods.

RESULTS & DISCUSSION

A total of fourteen specimens of *L. belgicus* were found on seven sampling locations across six sites – 3 males and 11 females. Although the sample size was small, the common factor in their

occurrence was very clear: the denser acid grassland, heath and scrub on mineral soils. There were just single occurrences from the other three main vegetation types (Table 1).

TABLE 1: Relationship between occurrence of *Leptoiulus belgicus* and vegetation density and soil type

	Mineral soils		Peat soils	
	Open vegetation	Dense vegetation	Open vegetation	Dense vegetation
Number of site studied	9	9	14	7
Number of sites with *L. belgicus*	1	5 (56%)	1	1
Number of individuals taken	1f	3m 8f (79%)	1m	1f

The millipedes were mainly taken by pitfall trapping, but a few females were also taken by sweep-netting and beating. One female was swept from tall dense acid grassland with clumps of heath and another from dense *Molinia* tussocks with bushy heath; the third was beaten from tall dense gorse heath. Clearly the females - at least - are active climbers amongst relatively tall coarse vegetation. The tussock site was the only site on peat soils to produce a female and this may be due to the ability here to remain high amongst the continuous tall tussock vegetation, above the potentially wet ground below.

The only other millipede species found in any numbers was *Ommatoiulus sabulosus* (L.), also with fourteen specimens taken. It was associated with the dwarf shrub heath vegetation on mineral soils. Single specimens were also taken of *Glomeris marginata* (Villers) and *Cylindroiulus latestriatus* (Curtis).

CONCLUSIONS

Although the data was limited in quantity, there does seem to be clear evidence that *L. belgicus* is associated with the taller and denser vegetation on mineral soils, in this area of moorland at least. The females - at least - are active high in the vegetation structure as well as at ground level.

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