

***Polydesmus taranus* Verhoeff, 1936, a millipede new to Britain, ‘hiding’ among additional British localities for *Polydesmus asthenestatus* Pocock, 1894 (Diplopoda: Polydesmida: Polydesmidae)**

Steve J. Gregory

Brook Cottage, Uffington, Faringdon, Oxfordshire SN7 7RE, UK.

Email: stevejgregory@btopenworld.com

Abstract

Polydesmus taranus Verhoeff, 1936 is reported new to the fauna of the British Isles from three synanthropic sites in southern England and the Channel Isles. At two of these sites *P. taranus* was found associated with *Polydesmus asthenestatus* Pocock, 1894, a morphologically similar species (including male gonopods), which are the second and third British records. A brief description with figures is provided, and comparison is made with *P. asthenestatus*, to enable identification. Information is provided about habitats and micro-sites inhabited and associated species. *Polydesmus taranus*, and indeed also *P. asthenestatus*, must surely be awaiting discovery at additional synanthropic sites in Britain, possibly both species together.

Key words: Polydesmidae, *Polydesmus taranus*, new for UK, identification, habitats, distribution.

Introduction

Seven species of *Polydesmus* Latreille are listed from Britain and Ireland by Lee (2006). An eighth species, *Polydesmus asthenestatus* Pocock, 1894, was discovered in Co. Down, Northern Ireland in 2008, where it has subsequently proved to be widespread (Anderson, 2015).

On 9 September 2020 a visit was arranged to Lamorran House Gardens, St. Mawes, Cornwall (SW843331), primarily to look for woodlice, millipedes and centipedes. This subtropical Italianate inspired garden is about 2 acres (c. 0.8 ha) in extent, lies on a south facing slope and, lying on a narrow peninsular, is surrounded by the sea on three sides. It has not experienced a major frost since 1987 (www.lamorrangardens.co.uk/about.html). A wide array of sub-tropical plants, including many from the southern hemisphere, are successfully cultivated. Towards the top of the gardens several specimens of a small fast-moving darkly pigmented polydesmid millipede were collected from among deep accumulations of damp leaf litter.

The specimens proved to be immature, but included two sub-adult males just 8 mm in length. These seemed to be a good morphological fit for *Polydesmus asthenestatus*, but since this would be the first British record for this species then the collection of mature males (which are winter active; Anderson, 2015) was required to confirm this determination. Meanwhile in November 2020 *P. asthenestatus* was confirmed as a British species based on a mature male specimen collected from a limestone cave in south Devon (Knight, 2021). A return visit to Lamorran House Gardens by the author was arranged a year later in November 2021 to look for mature winter active *Polydesmus* males.

***Polydesmus taranus* new to Britain**

The return visit to Lamorran House Gardens on 28 November 2021 resulted in the collection of several adult male specimens of ‘small’ *Polydesmus* species. This included three specimens of *Polydesmus asthenestatus* (a determination confirmed by Per Djursvoll, University Museum of Bergen, from images of the gonopod), the second British record (Table 1). However, it was apparent that there were four slightly larger male specimens in the sample (Fig. 1) that appeared to have subtly different gonopods, which were initially thought to be natural species variation. However, images posted on the BMIG

online group (IMBI, 2021) were provisionally identified as *Polydesmus taranus* Verhoeff, 1936 by Per Djursvoll who subsequently confirmed this determination following examination of a male specimen.



Figure 1: Relative size of *Polydesmus* males collected from Lamorran House Gardens.

Polydesmus taranus (top) c. 10.5 mm in length; *Polydesmus asthenestatus* (below) c. 8.5 mm in length.

Subsequently, there have been two additional observations of *Polydesmus taranus* in the British Isles (Table 1). On 6 November 2022 Andy Marquis collected a male *Polydesmus taranus* from Le Foulon Cemetery, St. Peter Port on Guernsey (Channel Islands) (WV319781, VC113) (Fig. 2). This identification also confirmed by Per Djursvoll from images posted on the BMIG online group (IMBI, 2022) and record details subsequently submitted to iRecord (<https://irecord.org.uk/>). Then on 8 January 2023 Mark Telfer (pers. comm.) collected both *Polydesmus taranus* and *P. asthenestatus* at Ventnor Botanic Gardens, Isle of Wight (SZ5476, VC10) (images of slide mounted gonopods seen by the author). Here one male *P. taranus* and two male *P. asthenestatus* were collected from inside an unheated glasshouse and an additional male *P. asthenestatus* was found outdoors under a stone. In April 2023 an additional locality for *P. asthenestatus* was discovered on the Isle of Man by Sue Harvey (record details submitted to iRecord).

These are the first recorded occurrences of *Polydesmus taranus* Verhoeff, 1936 in the British Isles. These records (Table 1) also include the second, third and fourth British localities for *P. asthenestatus*.

Table 1: Known locations of *Polydesmus taranus* and *P. asthenestatus* in the British Isles

Locality	'County'	Date	<i>P. taranus</i>	<i>P. asthenestatus</i>	Source
Kitley Cave	Devon	21.xi.2020		1♂	Knight, 2021
Lamorran House Gardens	Cornwall	28.xi.2021	3♂♂	2♂♂	pers. obsv.
Le Foulon Cemetery	Guernsey	06.xi.2022	1♂		Marquis, A.
Ventnor Botanic Gardens	Isle of Wight	08.i.2023	1♂	3♂♂	Telfer, M.G.
Laxey	Isle of Man	23.iv.2023		1♂	Harvey, S.

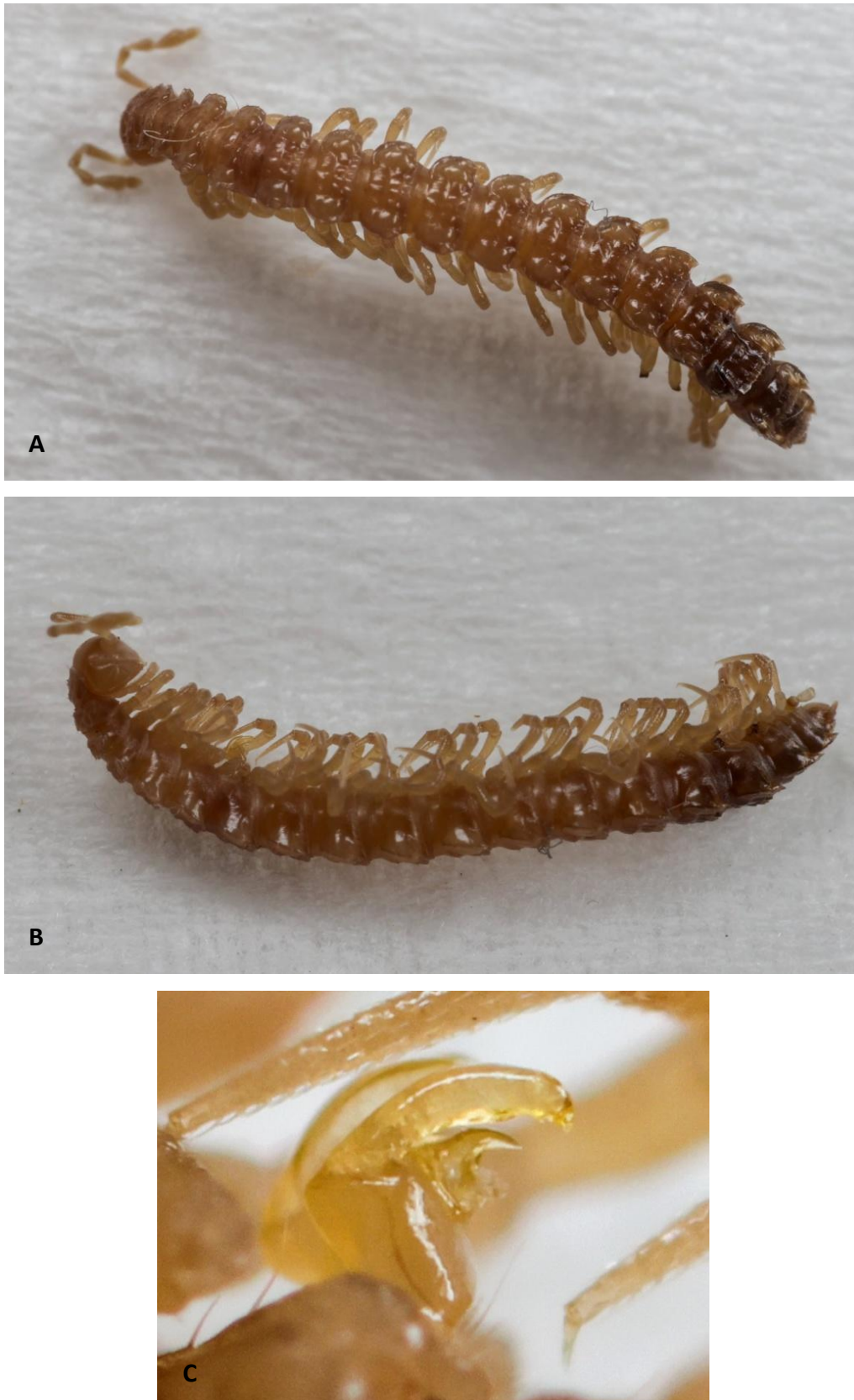


Figure 2: *Polydesmus taranus* male, specimen from Le Foulon Cemetery, Guernsey
A) Dorsal view; B) Lateral view; C) Male gonopods in situ. Images © Andy Marquis.

Identification

Adults of *Polydesmus taranus* have 20 body rings (including collum). Colour is a reddish brown with distinct dorsal sculpturing similar to that seen in other more widespread British *Polydesmus* species. This is a relatively small species with the three male specimens collected from Lamorran House Gardens ranging in body length (head to telson) from 10 to 10.5 mm. In his original description Verhoeff (1936) gives $10\frac{1}{3}$ to $10\frac{2}{3}$ mm, while Attems (1940) gives 10 to 11 mm. It is, however, consistently larger than *P. asthenestatus* (as noted by Mauries, 1969). Specimens of *P. asthenestatus* collected from Lamorran House Gardens ranged between 8 to 9 mm in length, while Pocock's (1895) original description gives body length as 8 mm and Verhoeff (1936) gives $8\frac{1}{2}$ to $9\frac{1}{2}$ mm for *P. asthenestatus* ssp. *borgotarensis* (a synonym of *P. asthenestatus*, Sierwald & Spelda, 2022). Probable females of both species collected from Lamorran House Gardens are slightly larger than their respective males.

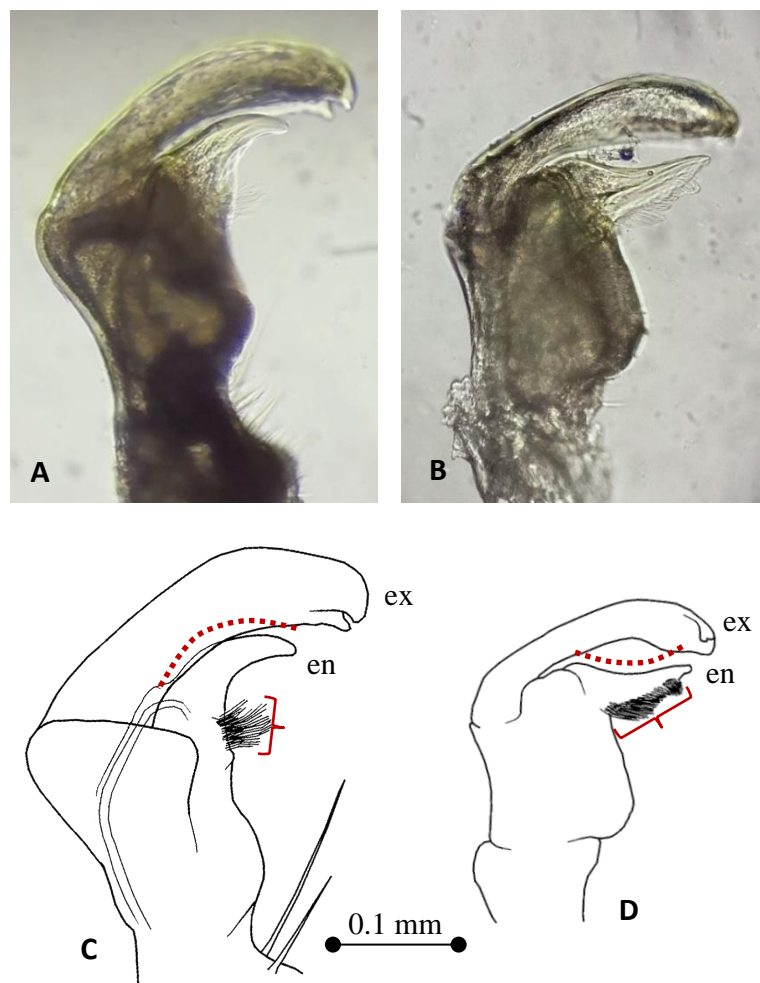


Figure 3: *Polydesmus* male telopodites, external view, from Lamorran House Gardens.

A, C) *Polydesmus taranus*; B, D) *Polydesmus asthenestatus*. Note curvature of endomere (en) relative to exomere (ex) (red dotted line) and extent of hairs on hairs of the pulvillus (bracketed).

In mature males the telopodite of the gonopods of *P. taranus* are very similar to those of *P. asthenestatus* (Fig. 3A-D), but otherwise quite distinct from other British *Polydesmus* species. In both species the exomere of each telopodite is broadened apically with a bluntly rounded tip, but that of *P. taranus* is relatively broader compared to its length. The most reliable character to separate the two

species is the shape of the endomere (en) (the solenomere of Anderson, 2015). In *P. taranus* this is curved with a convex upper surface that lies parallel to the curvature of the exomere (ex) (Fig. 3A, 3C). In contrast the endomere of *P. asthenestatus* has a concave upper surface opposing the curvature of the exomere giving a ‘pincer-like’ appearance to the gonopod structure (Fig. 3B, 3D). In addition the hairs of the pulvillus (of the endomere) are restricted to distinct clump at the base in *P. taranus*, but extend further distally on *P. asthenestatus*. Male gonopods of both species figured in Verhoeff (1936, figs. 75 & 76), Mauriès (1969, figs 27 & 28) and in Demange (1981, figs. 174 & 175).

Distribution and habitats

Polydesmus taranus is only known from a handful of localities and where it is native to a restricted area of north-west Italy (Liguria) and the adjacent (French) island of Corsica (Kime & Enghoff, 2011). Here, it has been recorded from among humus in *Quercus/Castanea* woodland on sandstone (in Liguria) and gullies in granite formations (on Corsica) and by old walls and heaps of stones. The few records suggest this is an upland species favouring shady mountains above 500 m a.s.l. (Kime & Enghoff, 2011).

In contrast, in the British Isles *Polydesmus taranus* is currently known from three lowland localities either on the south coast of England or the Channel Islands; Lamorran House Gardens, Cornwall; Ventnor Botanic Gardens, Isle of Wight; and Le Foulon Cemetery, Guernsey (Table 1). All three areas are known for their relatively warm climate where a good number of exotic plants from various parts of the World can be grown out-of-doors, suggesting that *P. taranus* may be a warmth-loving species. It is known that its congener *P. asthenestatus*, which is also native to north-western Italy, is tolerant of low winter temperatures that can occur in Northern Ireland (Anderson, 2015). Although within its native range *P. taranus* is an upland species (Kime & Enghoff, 2011), and possibly tolerant of winter cold, its current known ‘southern’ distribution suggests that this may not be the case. So far mature males have been found in November and January suggesting that this is another winter active species (as is its congener *P. asthenestatus*).

At Lamorran House Gardens specimens of *Polydesmus taranus* were collected along with specimens of *P. asthenestatus* from two sample sites. The first towards the top of the gardens, beyond the Koi Carp pond, where a considerable depth of damp leaf litter has accumulated beneath shrubs in an un-managed corner (Fig. 4A). Other millipedes collected here include *Chordeuma proximum* Ribaut, *Blaniulus guttulatus* (Fabricius), *Cylindroiulus britannicus* (Verhoeff) and *C. punctatus* (Leach). The second sample was from an area where deep leaf litter had collected beneath shrubs, including closely spaced tree ferns (Fig. 4B). Of particular note here is the discovery of a population of a previous unknown polyzoniidan millipede *Siphonethus dudleycookeorum* Moritz *et al.*, 2022 (which is named in honour of the gardens’ owners). Other associated millipedes found here include *Haplopodoiulus spathifer* (Brölemann) (which was abundant), *C. britannicus*, *C. punctatus* and a single female *Brachyiulus* sp. The introduced Australian landhopper *Arcitalitrus dorrieni* (Hunt) was numerous at both locations.

At Le Foulon Cemetery the single male specimen of *P. taranus* was found in association with the millipedes *Anamastigona pulchella* (Silvestri) (another millipede native to northern Italy), *B. guttulatus* and *Leptoiulus belgicus* (Latzel) and the Landhopper *A. dorrieni*.

At Ventnor Botanic Gardens a single male *Polydesmus taranus* (and two male *P. asthenestatus*) was collected from inside an unheated glasshouse (Mark Telfer, pers. comm.).

An over-looked species?

It is of note that at both Lamorran House Gardens and Ventnor Botanic Gardens *Polydesmus taranus* was found associated with *P. asthenestatus*. In both cases the specimens collected that subsequently proved to be *P. taranus* were initially thought to be natural species variation of *P. asthenestatus* until closer examination revealed that they were indeed two distinct species. Historically it seems that *P.*

taranus has been repeatedly confused with *P. asthenestatus* (both were initially included under the name *P. dispar* Silvestri, 1895) (Kime & Enghoff, 2011). This was highlighted by Mauriès (1969) who found that material collected in 1902 and attributed to *P. dispar* (now considered a synonym of *P. asthenestatus* by Millibase, Sierwald & Spelda, 2022) actually contained male specimens of both *P. taranus* and *P. asthenestatus*. In Demange (1981) both species key out together under the name *P. asthenestatus*/*P. taranus* (?), but gonopods of both species are illustrated (i.e. figs. 175 and 174, respectively).



Figure 4: Deep accumulations of leaf-litter under shrubs at Lamorran House Gardens where both *Polydesmus taranus* and *P. asthenestatus* were recorded.

A) Unmanaged corner above the Koi Carp pond; B) Area with tree ferns (where the polyzoniidan *Siphonethus dudleycookeorum* sp. nov. was also found).

Polydesmus taranus (and indeed also *P. asthenestatus*) must surely be awaiting discovery at additional sites in Britain. Currently *P. taranus* is only known from synanthropic sites, two ornamental gardens and a graveyard (near a garden centre), but it may be found in other ‘disturbed’ habitats. It is stressed that all recorders who find ‘small’ *Polydesmus* species should be aware that both *P. asthenestatus* and/or *P. taranus* may be present in the samples.

Acknowledgements

I am indebted to Robert and Maria-Antoinette Dudley-Cooke, owners of Lamorran House Gardens, for allowing unrestricted access to survey for invertebrates in 2020 and 2021.

I thank Per Djursvoll, University Museum of Bergen, for examining a male specimen from Lamorran House Gardens and confirming the identification as *Polydesmus taranus*. Both Per Djursvoll and Hans Reip, Senckenberg Research Institute, kindly provided relevant literature.

I also thank Andy Marquis, Mark Telfer and Sue Harvey for allowing the inclusion in this paper of their subsequent discoveries of *P. taranus* and/or *P. asthenestatus*. Andy Marquis kindly permitted the use of his images of a male *P. taranus*.

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