

NORTHERLY EXTENSIONS OF THE KNOWN U.K. RANGES OF THE PILL-WOODLICE *ARMADILLIDIUM VULGARE* (LATREILLE, 1804) AND *ARMADILLIDIUM PULCHELLUM* (ZENCKER, 1798)

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INTRODUCTION

It would be fair to say that, for many invertebrate taxa, Scotland is fairly poorly recorded and this is also true for woodlice. The pill-woodlice (*Armadillidium* spp.) are certainly not thought of as being typically Scottish species, given their need for calcium and the acid nature of much of the geology. *Armadillidium vulgare* (Latreille, 1804) has a decidedly S.E. distribution in the British Isles, becoming most commonly coastal in the north of its range. Harding and Sutton (1985) show the northern-most limit for this species as being the coast of Fife, in Scotland. Collis (2006) updated the Scottish distribution with additional records from West Scotland and this appeared to reconfirm the northern limits of this species' distribution as the Clyde Estuary in the west and the Tay in the East.

Many animals are limited by the availability of calcium, including birds which require it for their egg shell and nestling development. An interesting study by Bures & Weidinger (2003) linked the breeding success of collared and pied flycatchers in Central Europe to the availability of isopods and millipedes. They showed, by experiment, that these invertebrates provided up to 3 times more calcium than the snail shells which were also found in their natural diet. The breeding performance of captive birds increased 2-3 times when woodlice were added to their diet and this confirmed their importance in the diets of wild birds.

It is generally assumed that the distribution of at least the isopod species with the heavier exoskeletons is largely governed by the availability of calcium in their environment (Sutton, 1972). This is either obtained via their food from the soil or recovered by ingestion of their own cast skins. The greater restriction of these species to the coast in northern regions probably relates both to the availability of calcium from marine derived sediments and spray, and also to the milder climate.

ARMADILLIDIUM VULGARE

It was surprising then, while on a visit to the coastal village of Johnshaven in N.E. Scotland (NO800671; V.C. 91, Kincardineshire) on 6th September 2005, to find a population of *A. vulgare*. They were living amongst builder's rubble, deposited between the top of the shingle beach and the access road on top of the raised beach. This site is approximately 50-60km further north than previous records (Figure 1). Other woodlice found along with *A. vulgare* at this site were: *Oniscus asellus* Linnaeus, 1758, *Philoscia muscorum* (Scopoli, 1763), *Porcellio scaber* (Latreille, 1804) and *Trichoniscus provisorius* Racovitza, 1908.

Its occurrence in builder's rubble, as well as probably providing a suitable source of lime, perhaps indicates that the species has been imported to this site. Sutton (1972) highlights the association of isopods with the artificial environment provided by lime-rich building materials. Another possible linked explanation for this northern range extension, is the location's use as a Travelling Peoples' stance and their traditional involvement in road building and other construction work, as well as the transport of waste materials as they travel the countryside. Various other species are suggested as having been translocated intentionally by Travelling People, e.g. freshwater pearl mussels and varieties of willow (for basketry; Wilkinson & Vedmore, 2001) and no doubt other species of plant and animal have been similarly moved accidentally over the centuries. A perhaps less romantic dispersal mechanism involves the construction or operation of the nearby disused railway line (Gregory 2009).

It subsequently turned out that this was not the first record of *A. vulgare* from this location – having first been recorded here by S.J. McWilliam on 8th August 1998, also at NO800671 (S. Gregory, pers. comm.).

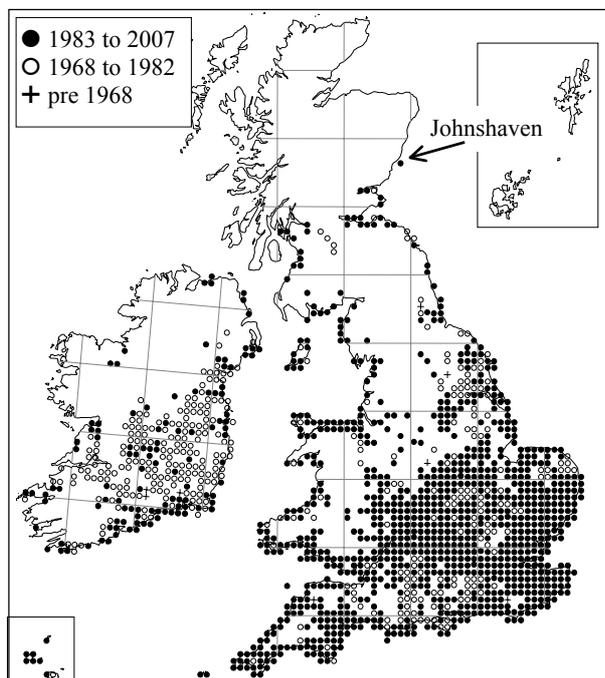


FIGURE 1: *Armadillidium vulgare*. Distribution in Britain and Ireland, highlighting the Johnshaven record (after Gregory, 2009).

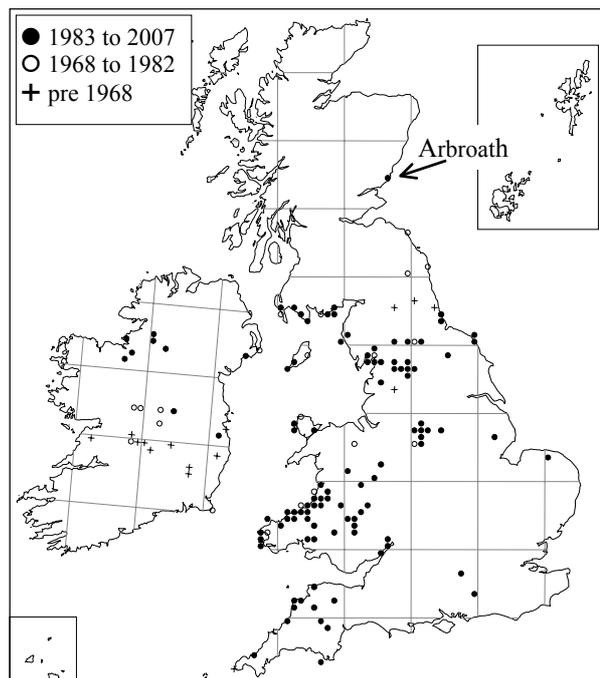


FIGURE 2: *Armadillidium pulchellum*. Distribution in Britain and Ireland, highlighting the Arbroath record (after Gregory, 2009).

ARMADILLIDIUM PULCHELLUM

A much more significant record, however, was the discovery of a large population of *Armadillidium pulchellum* (Zencker, 1798) at Seaton Cliffs (Scottish Wildlife Trust Reserve) near Arbroath (NO662412; V.C. 90, Angus) on 17th May 2006. This is approximately 100km north of the pre-1980 record near Berwick (Harding & Sutton, 1985). These small pill-woodlice were found in the dry soil on a warm grass slope on the sandstone cliffs. Other woodlice recorded at this site were *P. muscorum* and *Trichoniscus pusillus sensu lato*.

Gregory and Richards (2008) provide useful supplementary information for the reliable separation of *A. pulchellum*, *Armadillidium pictum* Brandt, 1833 and *A. vulgare*; correcting various errors in Oliver and Meehan (1993). They describe *A. pulchellum* as being characteristically associated with rural semi-natural habitats; tolerant of acid substrates, but favouring calcareous soils; *A. pulchellum* also seems tolerant of higher levels of insolation; all of which seem consistent with the conditions at this site. The sandstones and conglomerate rocks of the Seaton Cliffs are from the Devonian Old Red Sandstone series. The derived red soil is sufficiently lime rich in places to support plant species such as clustered bellflower (*Campanula glomerata* L.) and carline thistle (*Carlina vulgaris* L.).

It seems likely that the geology and climate at this site are consistent with this being part of the natural distribution of *A. pulchellum* and that, as it is a small and inconspicuous species, it has been overlooked in the past. Searches along the coast, where the geology and aspect are suitable (at least as far north as the Highland Boundary Fault at Stonehaven) may well produce further populations.

Curiously, a recent casual conversation with a local mollusc expert at a biological recorders' forum led to the discovery of a further record of *A. pulchellum* for the same area of Seaton Cliffs at Arbroath. This was found

by R. Marriott when looking for a rare moss at NO66974182 on 2 March 2009 while walking on moss just below the cliff top. The isopod was on a tuft of moss (Richard Marriott, pers. comm.).

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