ARMADILLIDIUM ALBUM DOLLFUS (ISOPODA) ON THE SEFTON COAST—IMPLICATIONS FOR CONSERVATION

ALISON HAUGHTON

Harper Adams Agricultural College, Newport, Shropshire TF10 8NB.

JAMES BELL

Department of Environmental and Geographical Sciences, Manchester Metropolitan University, Manchester M1 5GD.

Armadillidium album is a coastal woodlouse and occurs on the upper strandline of sandy beaches that receive a continuous supply of driftwood (Vader & de Wolf 1988). The nocturnal *A. album* is known to burrow to depths of 10–20 cm (Harding & Sutton 1985; Atkinson & Felton 1993) feeding on bacteria and fungi (Vader & de Wolf 1988) associated with the decomposing driftwood.

A. album was thought to be rare (Harding & Sutton 1985), although now it is considered more widespread (Bratton 1991) and is probably 'local' in its distribution. Its worldwide distribution spans from the Mediterranean coasts of Italy to its northern-most point in Wigtownshire in Scotland (Oliver & Meechan 1993). Disturbance by man on existing and potential sites is increasing: sand extraction, beach cleaning and pollution have serious conservation implications for the survival of *A. album* (Harding & Sutton 1985; Vader & de Wolf 1988).

In this study, we investigated the effects of beach cleaning on the distribution of this woodlouse along the seaward edge of a stretch of sand dunes. Sand dunes are dynamic systems where sand is eroded or accreted by the action of wind. Constant deposition of sand on accreting dunes creates embryo dunes with a distinct flora that flourishes in a constant supply of wind-blown sand (NCC 1986). Eroding dunes cannot support an embryo-dune habitat due to a lack of sand supply. Embryo dune vegetation is characterized by an *Elytrigia juncea* foredune community, often with a *Elymus arenarius* sub-community (national vegetation classification SD5/SD7a) (Rodwell 1992).

METHODS & RESULTS

Armadillidium album was encountered in a pitfall-trap study of Raven Meols Local Nature Reserve (SD283055) on the Sefton Coast, during the period 19 July to 1 September 1993. Eight pitfall traps were placed at each of five sites along an area of embryo dunes: two sites directly behind the strandline, and the remaining three further away at an increased elevation. Identification was confirmed using Hopkin (1991) and Oliver & Meechan (1993). The strandline was rich in jetsam, mainly driftwood, rope and plastic containers. In this initial survey, *A. album* was recorded only from the two traps nearest to the strandline, suggesting that individuals are relatively sedentary, moving only 1 or 2 m up the beach at night and returning to the cover of the driftwood during the diurnal period. No attempt was made to determine the relative activity under a differing supply of driftwood, although it is thought that because food would be limited, search activity for this resource would increase as a result.

In 1995, we undertook a further, more extensive survey of strandline along the Sefton Coast from Hightown to Southport, a distance of 14 km, turning every piece of driftwood and manmade material in search of the woodlouse. We found that *A. album* occurred under almost every piece of driftwood, and to a lesser extent under other materials, on accreting dunes usually in association with *Orchestia* spp

(Amphipoda) and *Porcellio scaber* Latreille 1804 (Isopoda). However, the woodlouse was absent on all eroding dunes where embryo dunes were not able to form, even if drift material was present.

Where mechanical beach cleansing was found to be in operation at potential *A. album* sites on accreting embryo dunes, *A. album* was absent apparently due to lack of driftwood. However, where chestnut paling was used to define a beach area on accreting dunes, this fence restricted access by the beach cleaner, thus jetsam and litter were allowed to accumulate. In these areas *A. album* was found to inhabit all available sites.

Discussion

It seems clear that *A. album* moves only small distances away from its driftwood habitat during the night, despite a more favourable level of humidity during this period. Thus, populations of *A. album* can be described as isolated because of their sedentary nature, which results in considerable differences in population structure (Vader & de Wolf 1988). Although *A. album* can colonize new areas by passive dispersal, often just clinging onto drifting material during storms (Vader & de Wolf 1988), much is left to chance. The removal of habitat by beach cleaning increases the likelihood that a colonizing population will not survive due to an absence of food and habitat. Llewellyn & Shackley (1996) observed reductions in the populations of Coleoptera, Diptera and Amphipoda where cleaning had occurred, and concluded that beach cleaning had a deleterious effect on the strandline species diversity and population abundance. In this instance of *A. album*, driftwood is essential for its survival and distribution around the coasts of Britain (Harding & Sutton 1985) and our results concur with Llewellyn & Shackley (1996) that cleaning is damaging.

When advising on management of the characteristic and often specialized strandline faunal communities, Kirby (1992) recommends a non-interference strategy. Llewellyn & Shackley (1996) believe this is where conflict arises: local authorities are under increasing pressure, inspired by the incentive to obtain the Blue Flag Seaside Award, to improve conditions on their beaches. The determination to clean up beaches to such high standards as those set out in the Seaside Award Criteria Guidance Notes usually antagonizes conservation interests.

Proposals that involve a compromise by both parties, are something that we advocate in the light of our results. The need for cleaning the popular stretch of beach between Ainsdale and Southport is no doubt necessary for tourism during summer months. However, in line with Llewellyn & Shackley's (1996) recommendations, we also suggest seasonal, selective hand removal of smaller, more unsightly manmade materials leaving just large pieces of driftwood to retain some habitat for *A. album*. Alternatively, railway sleepers could be secured permanently at the strandline, whilst also remaining attractive and in keeping with the resort.

Acknowledgement

We would like to express our thanks to Chris Felton (Entomology Section, Liverpool Museum) for sharing his thoughts on the status and ecology of this woodlouse.

References

Atkinson, D. & Felton, C. 1993. Other invertebrates. In: Atkinson, D. & Houston, J. (Eds). *The sand dunes of the Sefton Coast*. Proceedings of the Sefton Coast Research seminar, 31 May 1991, Liverpool. National Museums and Galleries on Merseyside, Liverpool. p 106.

Bratton, J. H. (Ed) 1991. *British red data books: 3. Invertebrates other than insects*. JNCC, Peterborough.

Harding, P. T. & Sutton, S. L. 1985. *Woodlice in Britain and Ireland: distribution and habitat.* Institute of Terrestrial Ecology, Huntingdon.
Hopkin, S. P. 1991. A key to the woodlice of Britain and Ireland. *Field Studies* **7**: 599–650.
Kirby, P. 1992. *Habitat management for invertebrates: a practical handbook.* RSPB, Sandy, Bedfordshire.
Llewellyn, P. J. & Shackley, S. 1996. The effects of mechanical beach-cleaning on invertebrate populations. *British Wildlife* **7**: 147–155.
NCC 1986. *Ainsdale sand dunes.* NCC, Peterborough.
Oliver, P. G. & Meechan, C. J. 1993. Woodlice. *Synopses of the British fauna (new ser.)* **49**: 1–136.
Rodwell, J. S. 1992. (ed). *British plant communities, Vol. 3.* Cambridge, Cambridge University Press.
Vader, W. & de Wolf, L 1988. Biotope and biology of *Armadillidium album* Dollfus, a terrestrial isopod of sandy beaches, in the SW Netherlands. *Netherlands Journal of Sea Research* **22**: 175–183.

SHORT COMMUNICATION

A Recent Record of *Oedemera virescens* (L.) (Coleoptera: Oedemeridae) in Gloucestershire.—This extremely scarce beetle is listed in the *Review of the Scarce and Threatened Coleoptera of Britain* (Hyman & Parsons, 1992) as RDB2, vulnerable, and it would appear that most recent records come from north-east Yorkshire. It has, however, been recently collected from three sites in south-west Scotland (Morris, 1997). I collected this species in the Forest of Dean, where it had previously been recorded, near Staunton (SO563121) on 26.v.90. I recently re-examined the specimen, which is deposited in my personal collection, comparing it with specimens in the collections of the National Museum of Wales, Cardiff, and by referring to the underside characters figured by Vázquez (1993). Although certain that it was indeed a female *Oedemera virescens*, I asked Dr Brian Levey for a second opinion, and he kindly confirmed my identification. The ecology of the species is given as "broad-leaved woodland, pasture woodland and wood edges. Larval biology unknown but probably associated with dead wood" (Hyman & Parsons, 1992). Vázquez however, gives the following as possible larval foodplants: *Senecio jacobaea*, *Aconitum napellus*, *Typha*, *Helianthus tuberosus* and *Eupatorium*, the larvae being found in the stems. My specimen was caught by sweeping along a ride in mixed woodland, where certainly the dominant plant was *Senecio* sp, with *Eupatorium* and *Hypericum* to a lesser extent. This perhaps lends some weight to the assertion of Vázquez that larvae are found in plant stems and not in dead wood. It would appear that this species has a long history in the Forest of Dean and no doubt has occurred there in low numbers since it was first recorded by E. W. Morse in 1905 and again in 1913 (records in Atty, 1983). I have revisited the site on a number of occasions since 1990, but have not yet found it again.—P. M. PAVETT. Dept. of Biodiversity and Systematic Biology, National Museums and Galleries of Wales, Cathays Park, Cardiff CF1 3NP.

REFERENCES

Atty, D. B. 1983. *Coleoptera of Gloucestershire.* 136 pp. Cheltenham, Glos.
Hyman, P. S. & Parsons, M. 1992. *A Review of the Scarce and Threatened Coleoptera of Great Britain.* Part 1. 484 pp. J.N.C.C. Peterborough.
Morris, R. 1997. *Coleopterist* **5(3)**: 90.
Vázquez, X. A. 1993. Coleoptera Oedemeridae, Pyrochroidae, Pythidae, Mycteridae. *Fauna Iberica* Vol. 5, Madrid.