THE HABITAT PREFERENCES OF *POLYXENUS LAGURUS* (LINNÉ)

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The literature on millipedes tends to associate *Polyxenus lagurus* mostly with trees. Indeed, Hopkin & Read (1992) state that *Polyxenus* is a bark-dweller, while Blower (1985) is less categorical. A key feature of these three authors is that they were all based well inland at the time and were therefore most likely to encounter the bristly millipede on trees. Were they based on the coast, particularly in the south-west, their emphasis would potentially have been quite different. Blower (loc cit) refers to several records in coastal regions at the roots of halophile plants such as sea pink and beneath lichens and moss cushions growing on boulders. He also mentions it as an inhabitant of old stone or brick walls.

Hopkins and Read (loc. cit.) provide the following biological and ecological information about *Polyxenus* which help to inform our understanding of their habitat associations:

- Their small size and flattened profile enable them to live in small crevices including the spaces under peeling bark – this feature is referred to by the authors as their ecomorphological type.
- Their Malpighian tubules are closely attached to the hindgut and ensheathed by an envelope of flattened cells; this maximises water retention;
- They graze algae from the bark of trees;
- They live in dry habitats.

In a recent review of my personal records of this enigmatic species I have been able to draw out some suggestions about its field ecology. Of 51 records made between 1981 and 1992[1]:

- 18 counties represented across England & Wales;
- records from every month of the year, with peak in April-August period – most in May and June, although this perhaps reflects my own field activity patterns rather than that of the millipede;
- situations where found come under the following headings:
  - o three from dry rocky south-facing hillsides – Piddledown Common (Dartmoor), Ballard Down (Purbeck), and Lindisfarne (Northumberland);
  - o 9 from maritime therophyte zone on rocky seacliffs, from SW coasts;
  - o 33 from tree bark or within dry decay:
    - § 11 tree species;
    - § oak (10 occasions), field maple (5), beech (4), elm (3), willow (3), hawthorn (2), ash (2), Eucalyptus, pine, spruce, sycamore;
    - § open-grown trees – exposed situations;
    - § inland sites across S & E of England, incl. Cornwall, Devon & Dorset;
- Two uncategorised records, from heather (a dwarf shrub) and from a dead grass blade.

What becomes very obvious is that it is primarily a species of exposed solid surfaces, open to more or less direct sunlight, the exposure being sufficiently persistent for extensive development of encrusting algae and lichens to take place. This is presumably what Hopkin and Read (*loc. cit*.) mean by the rather ambiguous term ‘dry’. Two very different situations meet these requirements: i) the wood and bark of trees and shrubs growing in open situations, but also ii) exposed rocks in situations where succession to denser vegetation cover is unable to proceed due to the impacts of exposure, as on rocky coasts but also inland on rocky crags. Churchyards are also the source of many records held by the Millipede Recording Scheme (P. Lee, pers. comm.)

It also appears to require shelter close by, retreating into crevices, etc, presumably when the air humidity drops below a critical level, such that its anatomical and physiological adaptations to inhabiting ‘dry’ situations can no longer cope adequately.

[1] My more recent records are less accessible at present.

It is basically part of the epiphyte and saxicole invertebrate assemblage, alongside molluscs such as tree snail *Balea perversa* and lapidary snail *Helicigona lapicida*, bugs such as *Myrmedobia* spp, and many Psocoptera. This is a restricted but distinctive assemblage of invertebrates which are all too often overlooked by ecologists and conservationists, and only feature in nature conservation incidentally, courtesy of lichenologists.

The tree associations raise an additional question as to preference for different bark structures. Data on the relative frequency of different tree species in the places visited in the ten or so year recording years covered is not available. While the range of tree species represented suggests that most tree species can provide suitable conditions, the one tree species which stands out as having greater representation than might have been expected is field maple. The bark of this tree is particularly laminated in structure and thereby provides an especially good situation for crevice fauna. Although my impression had been that hawthorn was also well-represented, the actual data for the study period do not show this. It may be that my more recent experience of the species is somewhat different.

Another aspect of the tree associations is that older trees tend to have greater cover of epiphytes as well as greater variety of bark structures, and so *Polyxenus* is more likely to be found on older trees than young ones. Habitat continuity is undoubtedly important on rocky sites as well as trees and shrubs. The mobility of *Polyxenus* is little known. Hopkin and Read (loc. cit.) comment that millipedes have rather limited powers of dispersal, and that dispersal takes place primarily by walking. The exploitation of trees brings with it the need to move from tree to tree on occasion, and the association with more open-grown trees involves greater distances than might otherwise be imagined.

Blower (1985) also mentions that the millipede can be abundant in coastal sand dunes. It seems that the dry litter of marram tussocks can also meet its special requirements. It also is known from leaf litter in hotter drier climates such as in the Mediterranean region, eg David (1996) reports the species at densities exceeding 100 per square metre in holm oak forest *Quercus ilex* in southern France. It would be interesting to know how much these habitat associations vary across its global range.

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