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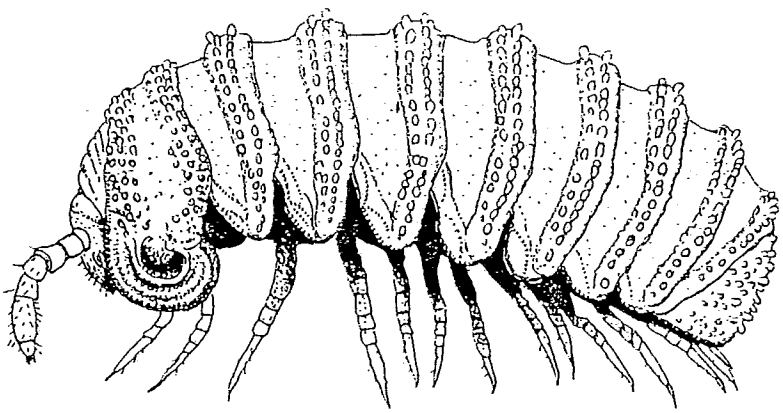
BRITISH MYRIAPOD GROUP

Edited for the Group by

A.D. Barber & J.G. Blower



Volume 3

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BULLETIN OF THE BRITISH MYRIAPOD GROUP

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Bulletin of the British Myriapod Group 3 (1986)

EDITORIAL

In this third volume of the Bulletin there is much evidence of interesting activity during the past year. The news that the Provisional Atlas of Centipedes is in an advanced state of preparation will please the faithful and industrious contributors to the Survey. Yet centipede recording is clearly still going on a pace; the frontiers have been extended to the Shetland Isles in the North and several Irish vice-counties in the South. A centipede new to Britain, two new to Ireland and 40 new vice-county records are reported here. If these are to be included in the Atlas, the organisation at the Biological Records Centre and the patience of those validating and checking data input will be severely taxed. But this is not the only activity on the centipede front. A second communication on a little-known species of centipede (Chaetechelyne vesuviana in Vol. 2, Henia vesuviana here) goes a long way towards making it one of the best-known, in the truly biological sense. This paper includes some fascinating observations; it is a paper very much in the spirit of the plea from John Lewis in the 1983 Newsletter.

The new Linnean Society Synopsis of the British Fauna - Millipedes has just been published and joins the key prepared for members by Adrian Rundle for the Bangor meeting last spring as a means of smoothing the way forwards for the millipede survey. As a measure of the accelerating pace of research it is noteworthy that, of the eight species of millipede additional to the 1958 Synopsis in the new edition, four have been added since the survey started in 1970; a fifth was found in 1985 just in time for inclusion. However, two more species new to Britain have been reported after the Synopsis went to press. One of these is recorded here in this volume, the other appears in the Spring Newsletter which just preceeded us into print.

This volume of the Bulletin appears on the eve of the fourth joint spring meeting of the British Myriapod Group and the British Isopod Study Group at Manchester Polytechnic. At this meeting we shall be paying homage to a much loved and respected founder member of BMG, Charles Brookes; two

of his friends and distinguished colleagues from the continent will be joining us to help remember Charles and his contribution to our science. The Manchester meeting is the second to have been held in the north where such studies as ours were inaugurated some three-quarters of a century ago by A. Randall Jackson, Richard S. Bagnall and S. Graham Brade-Birks and Hilda Brade-Birks. The family Brachychaeteumatidae featured in this volume was very much the product of these early pioneers.

It is perhaps worth remembering that these distinguished northerners who placed our subject on a firm base, were all amateurs; Jackson was a busy general practitioner, Bagnall was an industrial executive, S.G. Brade-Birks was a minister of the church and also a lecturer in Agriculture, and Hilda Brade-Birks was a Medical Officer of Health. We were reminded at the Bangor meeting that we could expect declining support in our Universities and Colleges for the type of pure research which BMG and BISG were pursuing. Such work now depends again on interested scientists who receive their remuneration from some other source. The study of animals in the field in the first half of this century was poorly represented in our seats of learning where the post-Darwinian pursuit of anatomy and physiology in the laboratory were the main occupations. The reduction in support for taxonomy and ecology we are now witnessing perhaps reflects a rather materialistic National outlook, which we hope is only a temporary phase. At all events, this Bulletin and all it represents, is manifest assurance that our part of science is in the safe hands of committed amateurs.

A. D. Barber

J. G. Blower

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CENTIPEDE RECORDS OBTAINED ON THE CONCHOLOGICAL SOCIETY EXPEDITION TO IRELAND, SEPTEMBER/OCTOBER 1984

Adrian J. Rundle, 29, Burlington Avenue, Kew, Richmond, Surrey, TW9 4DF.

Very little work has been done on the centipede fauna of Ireland since about 1920. Barber (1985) summarises our knowledge to date of the Irish fauna and states that only four people have made collections in the last ten years and that the records obtained only come from 91 10 km. squares. The areas which are most neglected are stated as being the north, north-west and south of Ireland. From the species point of view only 20 species are recorded and Barber comments on unrecorded species which are likely to occur. Here then, is an area particularly deserving of our attentions.

In contrast, the non-marine mollusc fauna of Ireland is quite well known with much of the country having been comprehensively surveyed. This level of coverage has been obtained to a fair extent by expeditions of small parties of experienced Conchological Society field recorders. On two of the most recent expeditions in September 1977 and April 1982 Mrs. E.B. Rands and Mrs. M. Fogan also made collections of certain invertebrate groups (including centipedes) and it is these that account for 74 of the 10 km. squares with recent records noted by Barber (the collections were not made by the present author as stated therein - he only requested their collection and identified them). A small party of three comprising the author and the two above-mentioned conchologists, made an expedition to Waterford and Cork in the south of Ireland between 19th September and 2nd October, 1984 in order to obtain further mollusc records from the area in squares either lacking records or from those which were obviously under-recorded. Whilst studying the molluscs many other groups of cryptic invertebrates occurring in similar habitats to the molluscs were also recorded. This paper is the first in a series to place the results of this expedition on record.

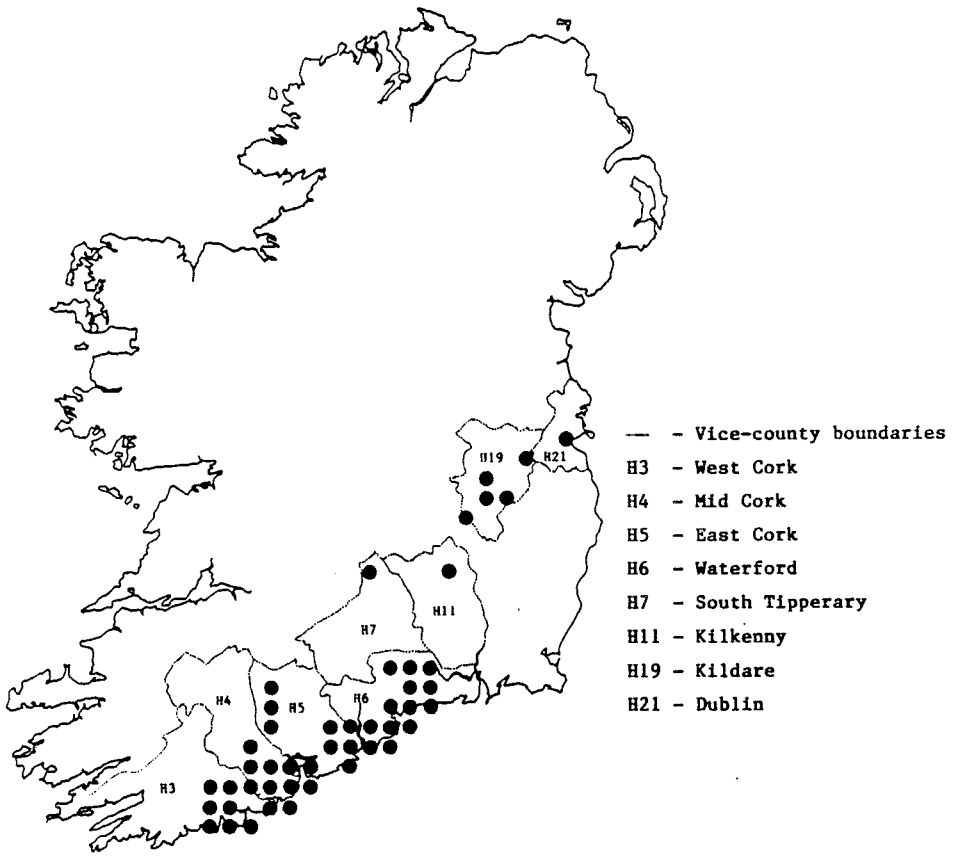

Figure 1. MAP SHOWING THE 10 KM. SQUARES SURVEYED, SEPTEMBER/OCTOBER 1984.

The main recording area comprised most of Waterford (vice-county H6), the southern half of Mid and East Cork (H4 and H5) and the south-east corner of West Cork (H3). Records were also obtained on the journeys between the main recording area and Dublin (see fig. 1). In all, 47 10 km. squares were studied and sixteen species of centipede found, two of which were new Irish records. A total of 179 10 km. records was obtained; details are given in table 1. These records also include 40 new vice-county records.

Each species will now be dealt with separately below:

Haplophilus subterraneus According to Barber (1985) there is only one recent record (from Dublin) although it has since been recorded from Sligo (vice-county H28) by Mr. D. Cotton (Barber, pers. comm. 1985). During the present survey it was found at 14 sites, all but two of which were from under rocks, etc. on roadsides. It was also found once under stones near the top of a rocky beach and once under rocks at the base of a churchyard wall. In all 10 males

Table 1. SUMMARY OF 10 KM. RECORDS OF CENTIPEDES OBTAINED IN IRELAND, SEPTEMBER/OCTOBER 1984.

SPECIES \ VICE-COUNTIES	WEST CORK (H3)								MID CORK (H4)								EAST CORK (H5)								WATERFORD (H6)																H7	H 11	KILDARE (H19)				H21	
10 KM. SQUARES	W 33	W 34	W 35	W 43	W 44	W 45	W 53	W 55	W 56	W 57	W 64	W 65	W 66	W 74	W 75	W 76	R 60	W 68	W 69	W 85	W 86	W 97	W 98	X 06	X 07	S 21	S 30	S 31	S 40	S 41	X 08	X 17	X 18	X 27	X 28	X 29	X 38	X 39	X 49	S 16	S 56	N 70	N 71	N 80	S 69	O 13	N 92
Haplophilus subterraneus		●			●		●	●	●	●	●	●			●	●	●		●									●	●																		
Schendyla nemorensis			●	●									●	●		●			●		●	●			●								●			●	●								
Strigamia crassipes																																●		●												
Strigamia maritima	●	●		●	●		●	●				●				●					●			●							●		●				●								
Geophilus electricus									●						●					●						●																			●		
Geophilus osquidatum																●																														
Geophilus insculptus																												●												●		●				
Necrophloeophagus longicornis																							●	●	●	●	●			●	●	●	●		●								●	●		
Brachygeophilus truncorum								●																					●	●																
Cryptops hortensis	●	●			●	●		●	●				●																										●								
Cryptops parisi													●			●			●																												
Lithobius variegatus		●					●	●	●		●	●	●	●	●	●		●	●	●	●	●	●	●	●	●		●	●	●	●	●	●				●	●			●						
Lithobius forficatus			●	●	●		●	●	●		●	●	●	●			●	●			●	●	●	●	●	●		●		●	●	●	●			●	●	●		●		●	●	●	●	●	●
Lithobius melanops			●				●		●			●				●		●			●		●		●								●	●	●			●			●					
Lithobius microps								●					●		●	●	●	●		●	●	●		●	●		●		●	●	●	●	●	●			●	●	●			●				●	●
Lamyctes fulvicornis	●									●		●	●								●																					●					

H7 = South Tipperary; H11 = Kilkenny; H21 = Dublin.

were found with 79 pairs of legs; two males with 81 pairs; 4 females with 79 pairs; 5 females with 81 pairs; 3 females with 83 pairs and one female with 89 pairs. The female with 89 pairs of legs is well outside the range of 79-83 for British material given by Eason (1964) but is just within that for French material given by Brolemann (1930).

New vice-county records: H3, H5 and H6.

Schendyla nemorensis This common species was widely recorded in the past but there seem to be very few recent records. It was found at 14 sites during the present survey, mostly from under rocks and in soil on roadside verges, but also once from under rocks next to an estuarine stream and twice in soil on top of vegetated roadside walls.

New vice-county records: H3, H4, H5 and H6.

Strigamia crassipes This rather uncommon centipede was recorded from widely scattered localities in Ireland in the past but there appears to be no recent records. It was found at two sites as follows:

X249923. Under rocks on disturbed waste ground next to garage, about 1 mile S.W. of Dungarvan, Co. Waterford (23-9-1984). 1 female with 51 pairs of legs.

X125817. In leaf/twig litter under roadside blackthorn hedge, 1½ miles S. of Clashmore, Co. Waterford (25-9-1984). 1 female with 51 pairs of legs.

New vice-county record: H6.

Strigamia maritima This is a common littoral centipede which occurs at about H.W.M. under rocks mostly on a sandy/clayey substrate or in cracks on rocky outcrops or cliffs. It was found at 14 sites and collected specimens were found to have the following leg counts: 19 males with 47 pairs; 8 males with 49 pairs; 28 females with 49 pairs; 12 females with 51 pairs and 1 female with 53 pairs. The female with 53 pairs is just outside the range given by Eason (1964) but within that of Brolemann (1930). The collected specimens show a marked preponderance of females over males.

New vice-county records: H4, H5 and H6.

Geophilus electricus This is a rather rare species which had been recorded from scattered localities although there is only one recent record. Five specimens were found as follows:

S682937. Under granite rock next to roadside shrine, Athy, Co. Kildare (19-9-1984 - E.B.R.). 1 female with 71 pairs of legs.

S244164. Under rock at base of roadside dry stone wall, just E.N.E. of Glendalough, Co. Waterford (22-9-1984). 1 female with 71 pairs of legs.

W888579. Under rock near old field wall, 3/4 mile E.S.E. of Gyleen, C. Cork (24-9-1985 - M.F.). 1 male with 67 pairs of legs.

W746566. Under rock under beech trees at base of churchyard wall, Minane Bridge, Co. Cork (26-9-1984). 1 juvenile with 71 pairs of legs.

W546687. Under piece of concrete beneath beech tree on roadside waste ground, Killumney, 3/4 mile S. of Ovens, Co. Cork (28-9-1984 - M.F.). 1 male with 65 pairs of legs.

New vice-county records: H4, H5, H6 and H19.

Geophilus osquidatum One specimen of this rare centipede was found:

W730625. Under large rock at edge of car park, Carrigaline, Co. Cork (26-9-1984). 1 female with 59 pairs of legs.

The specimen was instantly obvious in the field because the posterior 2/3 of the body had a bright phosphorescent greenish-yellow colour. This is the first time Geophilus osquidatum has been recorded from Ireland.

New vice-county record: H4.

Geophilus insculptus This widely recorded and not uncommon species was only found on three occasions:

S385142. In soil at base of wall surrounding a small area of waste ground, Clonea, Co. Waterford (22-9-1984). 1 male with 47 pairs and 1 female with 51 pairs of legs.

S112671. In soil under grass on roadside dry stone wall, Loughmore, Co. Tipperary (2-10-1984). 1 female with 51 pairs of legs and 1 juvenile.

N727125. Under rock on top of roadside grassy bank, Kildare, Co. Kildare (2-10-1984). 1 female with 51 pairs of legs.

It is worth noting that only one of these sites was in the main survey area and that the species is obviously rare there.
New vice-county records: H6, H16 and H19.

Necrophloeophagus longicornis This is the most recorded geophilomorph in Ireland and was found at 14 sites during the present survey. The main habitat was either in soil or under rocks on roadside verges, but it was twice found associated with the littoral woodlouse Ligia oceanica under rocks at the top of beaches. Only 12 specimens were retained and these comprised: 2 males with 51 pairs; 8 females with 53 pairs and 2 females with 55 pairs of legs. It would seem that females far outnumber males.
New vice-county records: H5, H6 and H19.

Brachygeophilus truncorum This is generally a common and widely distributed species but it was only found at three sites and would thus appear to be uncommon in the area studied. The habitats were under bark of a roadside elm log; in roadside beech leaf litter and under a rock at the top of saltmarsh mud associated with the littoral centipede Strigamia maritima.
New vice-county record: H6.

Cryptops hortensis This common species has only been recorded previously from six vice-counties in Ireland, three of these being numbers H1-3 in the S.W. corner. This S.W. pattern was evident during the present survey where 9 of the 10 sites come from West and Mid Cork. All specimens came from under rocks on roadside verges.
New vice-county records: H4 and H6.

Cryptops parisi This is a rare species in England occurring in scattered synanthropic sites, although more common in parts of S.W. England. It is here recorded from Ireland for the first time and was found at three sites:

W744603. Under rock near roadside stream, 1½ miles S.E. of Carrigaline, Co. Cork (26-9-1984). 1 specimen.

W634622. Under rock on roadside (L68) verge, Ballinhassig, Co. Cork (27-9-1984 - E.B.R.). 1 specimen.

W647997. Under concrete slab by roadside near bridge over River Blackwater, Killavullen, Co. Cork (29-9-1984 - E.B.R.). 1 specimen.

New vice-county records: H4 and H5.

Lithobius variegatus This common species was found at 37 sites during the present survey. Most of these were from beneath rocks, pieces of wood, etc. on roadside verges, but it was also found on five occasions in leaf litter and three times under the bark of elm or spruce logs. As many males as females were found - 33 of each. It is worth noting that all specimens seemed to be typical with no over-large animals being found (i.e. none as large as the continental form of the species, L. rubriceps).

New vice-county records: H5 and H6.

Lithobius forficatus This proved to be the most common centipede and was found in two-thirds of the squares surveyed. Of the 41 site records, 25 were from under rocks, pieces of wood, etc. on roadside verges. In addition, farmyard records totalled 5 and it was found under rocks at about H.W.M. at the top of beaches on 4 occasions. It was associated with the preceeding species at 13 sites.

New vice-county records: H4 and H5.

Lithobius melanops This is a widespread medium-sized Lithobius and was found at 14 sites. Three of these were from amongst moss on roadside walls, three from under bark of roadside elm logs and two from under rocks at the top of beaches. Collected material comprised 9 males and 8 females.

New vice-county records: H4, H5 and H6.

Lithobius microps This very common and distinctive little species was found at 24 sites, most of which were from under rocks, etc. or in soil on roadside verges.

New vice-county records: H4, H5 and H6.

Lamyctes fulvicornis This is an uncommon, although widely distributed species, and was only found at six sites as follows:

W869658. Under rock on roadside waste ground near top of beach, Rostellan, Co. Cork (24-9-1984). One female.

W634622. Under rock on roadside (L68) verge, Ballinhassig, Co. Cork (27-9-1984). One female.

W658583. Under rock on roadside (L42) bank, 1 mile E. of Ballymartle, Co. Cork (27-9-1984). One female.

W694515. In damp grass cuttings at base of roadside wall, Ballinclashet, 1 3/4 miles W.S.W. of Nohaval, Co. Cork (27-9-1984). Three females.

W549702. Under stone on roadside verge, Ovens, Co. Cork (28-9-1984). One female.

W393394. Under rock on landward side of roadside sea wall of estuary, 1 1/4 miles S.S.E. of Clonakilty, Co. Cork (1-10-1984). One female.

New vice-county records: H3, H4 and H5.

ACKNOWLEDGEMENTS

The author would like to thank the other two members of the survey party for all their help, both in the field and back at our lodgings each evening where the day's notes and collections required a lot of attention. Thanks must also go to Mr. and Mrs. J. Long of Cherrymount Farm, Youghal, Co. Cork for their friendly hospitality and tolerance of our unusual activities.

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PORATIA DIGITATA, A NEW BRITISH HOTHOUSE MILLIPEDE

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This paper places on record a small hothouse millipede new to Britain. The first specimens of it were collected from amongst peat in the Tropical Fern House of the Royal Botanic Gardens, Kew, Surrey (grid reference TQ(51)188777) on 21st April 1985, whilst one of the authors (A.J.R.) was showing Mr. E.G. Philp some of the local specialities on our return from the B.I.S.G./B.M.G. Meeting in Bangor. They were identified as Prosopodesmus panporus even though they were slightly larger than that species and had a pale colour. Further specimens were obtained by the same author from under bark and in soil in the Orchid House of the Leicester Museum Botanic Garden (grid reference SK(43)593072) on 14th September, 1985 and were again named in the field as Prosopodesmus panporus. It was only when checking these specimens later at home that it was realised that a different species was involved and specimens were sent to the other author (J.G.B.). The species Prosopodesmus panporus was only recently described from Kew (Blower & Rundle, 1980) and the authors at first thought that they had examples of Poratia digitata as figured and described by Schubart (1934). This time, one of us (J.G.B.) is certain that the animals are Poratia digitata, in the sense of Schubart (1934) and Attems (1940), but there is some doubt about the validity of the name.

CLASSIFICATION

Attems (1940) placed Poratia in the family Cryptodesmidae, sub-family Pyrgodesmidae. Schubart (1934) used the family name Stylodesmidae which is a synonym of Pyrgodesminae. Hoffman (1980) places Poratia in the Pyrgodesminae elevated to family status. (Attems (1940) placed Prosopodesmus in the same subfamily as Poratia but Hoffman (1980) has moved it into the family Haplodesmidae within the superfamily Polydesmoidea.)

Order POLYDESMIDA
Sub-order POLYDESMIDEA
Superfamily STYLODESMOIDEA
Family PYRGODESMIDAE

Poratia O.F. & A.C. Cook, 1894
Scytonotus Porat, 1889
Tidopterus Chamberlin, 1923 a
Dominicodesmus Chamberlin, 1923 b
Muyudesmus Kraus, 1960

Poratia digitata (Porat, 1889)
Scytonotus digitatus Porat, 1889 Ent. Tidskr. **10** : 59
Poratia heterotuberculata Carl, 1902
Dominicodesmus panamicus Chamberlin, 1940
(?) Muyudesmus obliteratus Kraus, 1960

DESCRIPTION OF THE LEICESTER EXAMPLES (somatic characters of the trunk)

Colour: pale pinkish brown.

Dimensions:

5 females with 19 segments: 3.9 - 4.1 mm. long, 0.56 - 0.64 mm. broad (between paranota of segment X)

1 female with 18 segments: 3.2 mm. long, 0.47 mm. broad.

One of the females with 19 segments is shown in fig. 1.

Collum does not quite completely cover the head in dorsal view, its anterior edge forming an up-turned rim incised into ten lobes. All the incisions are deep, except those separating the most lateral pair of lobes; there are six distinct tongue-like lobes flanked by two broader bifid ones. Surface of collum tuberculate, ten of the tubercles are larger and a little more prominent. Second segment with paranota extending a little beyond the lateral edges of the collum, third and fourth segments a little narrower, the succeeding segments widening somewhat and then narrowing towards the tail, especially segments 18 and 19.

Metazona strongly arched with principally three transverse rows of tubercles, interspersed by more irregularly placed smaller tubercles, especially on the anterior segments. In the posterior half of the trunk,

some of the tubercles are longer and more prominent and form four longitudinal rows; from segment sixteen, the hindmost tubercles in these four rows project over the posterior edges of the metazona. On all metazona, the posterior transverse row ends laterally in a slightly posterior directed more prominent lobe (the 'rhomboidal projection' of Kraus, 1960). The metazona extend laterally into three-lobed paranota, jutting out horizontally at just below mid-lateral level. Segments 5, 7, 9, 10, 12, 13 and 15 bear ozopores on the middle lobes of the paranota and, on these segments, the posterior lobe is very much reduced; the remaining segments without ozopores have paranota with the three lobes equally developed. In dorsal view, the prominent outer tubercles of the last transverse row on each of the metazona may be easily misinterpreted as a fourth lobe of the paranotal edge.

The foregoing description of the principal somatic characters of the trunk agrees in most respects with the text and figures in Silvestri (1923), Attems (1940) and Schubart (1934) for Poratia digitata and in Kraus (1960) for Muyudesmus. Like Kraus (1960) we have not been able to locate ozopores on segments posterior to fifteen and note, with Kraus, that the paranota on these posterior segments have the form of non-pore bearing segments.

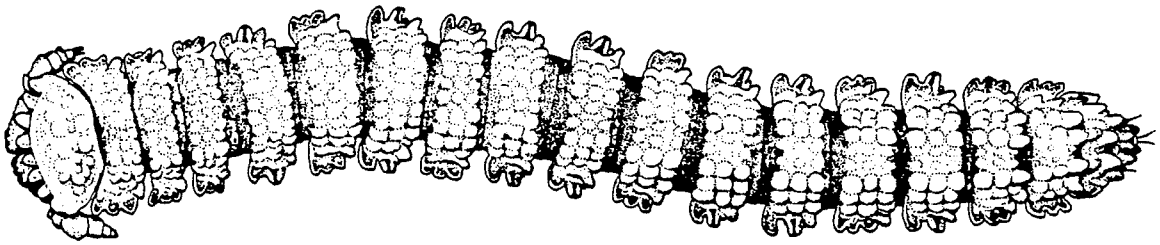

Figure 1. Poratia digitata. Dorsal view of female with 19 segments, from Leicester (J.G. Blower Collection).

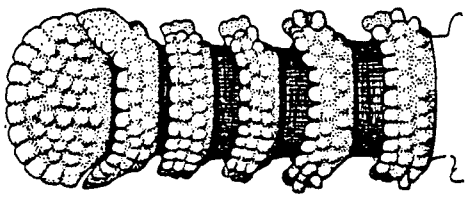

Figure 2. Prosopodesmus panporus. Dorsal view of anterior end of male paratype from Kew (previously illustrated in lateral view in Blower & Rundle (1980, fig. 1).

DISTRIBUTION

Poratia digitata was described from a greenhouse in Gothenburg, Sweden in 1874 and was subsequently observed also by Lohmander (1925). Elsewhere in Europe it is recorded from: Denmark, Copenhagen, Botanic Gardens, in hothouses, beds and in refuse heaps; Switzerland, Berne, Botanic Gardens (Carl, 1902); Germany, Hamburg, tannery (Latzel, 1895) and Berlin, Botanic Garden, orchid house (Schubart, 1929). We can now add its occurrence in botanic gardens at Kew, Surrey and Leicester.

Attems (1940) records it from Java and in tropical South America and Carribean countries: Brazil, Argentina, Paraguay and Costa Rica. Loomis (1968) records it from various localities in the Canal Zone of Panama in the same areas where he also records two other species of Poratia. Kraus (1960) describes two species of his genus Muyudesmus from Peru.

DISCUSSION

Of the two species of Muyudesmus described from Peru, the gonopods of Muyudesmus obliteratus resemble those figured by Silvestri (1923) for Poratia digitata. Kraus notes appreciable and possibly specific differences between M. obliteratus and Poratia digitata sensu Silvestri, but believes these two animals to be congeneric. Kraus wonders whether the gonopods figured by Silvestri belonged to the same species originally described by Porat; he observes that none of the authors (including Porat) who handled European examples, had seen males of the animal they called P. digitata. The doubt clearly arose in Kraus's mind since his two species of Muyudesmus resemble each other closely in their somatic characters but have very different gonopods. Hoffman (1980), referring to the doubt raised by Kraus, suggests that Porat's material should be re-examined in the hope that it contains males. If European colonists from the tropics have established themselves in temperate zones by parthenogenesis, validation of the genus Poratia will be difficult. In fact, males appear to be rare even in the tropical zones; as far as we are aware, the only males of Poratia digitata occurred in the material Silvestri (1923) re-examined from Brazil.

COMPARISON OF PORATIA DIGITATA AND PROSOPODESMUS PANPORUS

Both P. digitata and P. panporus (see fig. 2) have three transverse rows of tubercles on their arched metazona, a second segment wider than the collum which overlaps a large part of the head and three lobes on the paranotal lateral edges. The most obvious difference between these two animals is the deeply incised front rim of the collum of Poratia with forwardly and upwardly projecting tongue-like lobes. Less obvious, but more fundamental, is the arrangement of the ozopores in the two animals; in Poratia digitata they are found on the middle paranotal lobe of segments 5, 7, 9, 10, 12, 13 and 15 (the 'normal' formula for a Polydesmidan); in Prosopodesmus panporus, the ozopores pierce tubercles (porosteles) lying above the paranotal edges, obscuring one of the lobes in dorsal view. Furthermore, as the trivial name panporus suggests, ozopores occur on all diplopodous segments.

MATERIAL

Three females from Leicester have been deposited in the British Museum (Natural History); Six females from Leicester are in the J.G. Blower Collection and the remaining material (all females) from Leicester and Kew is in the A.J. Rundle Collection.

ACKNOWLEDGEMENTS

We wish to thank the Director of the Royal Botanic Gardens, Kew and the Leicester Museums Service for the permission afforded to one of us (A.J.R.) to study their hothouse faunas.

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TRACHYSPHAERA LOBATA (RIBAUT), A MILLIPEDE NEW TO BRITAIN, FROM THE ISLE OF WIGHT

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Introduction

On 27 June 1984, whilst sieving soil at East Cliff, Bembridge, Isle of Wight, (40/648888) we discovered a small white pill millipede which occurred in considerable numbers in the samples. These were subsequently identified as Trachysphaera lobata (Ribaut, 1954). This is the first record of this species in Britain.

Description

In the field, small individuals appear brilliant white. Mature individuals are a dirty brownish white. Closer inspection shows that they are largely colourless (though there is some pigmentation on the head and antennae), with rows of a white chalky deposit along the transverse ridges which make up the rear third of each tergite. Eleven apparent tergites are present in the adult, including the collum, shield and telson. On all tergites except the collum the transverse ridges bear double rows of excrescences or tubercules which may be prominent in preserved specimens, but which are partly or almost embedded in the chalky deposit in live animals. Tergite two, the shield, has additional rows of tubercules at the front as well as the back. This tergite is characterised by large ear-shaped lateral depressions. The area of tergite in front of each ridge is covered with white chalky reticulations. The collum is smooth with four minute transverse ridges.

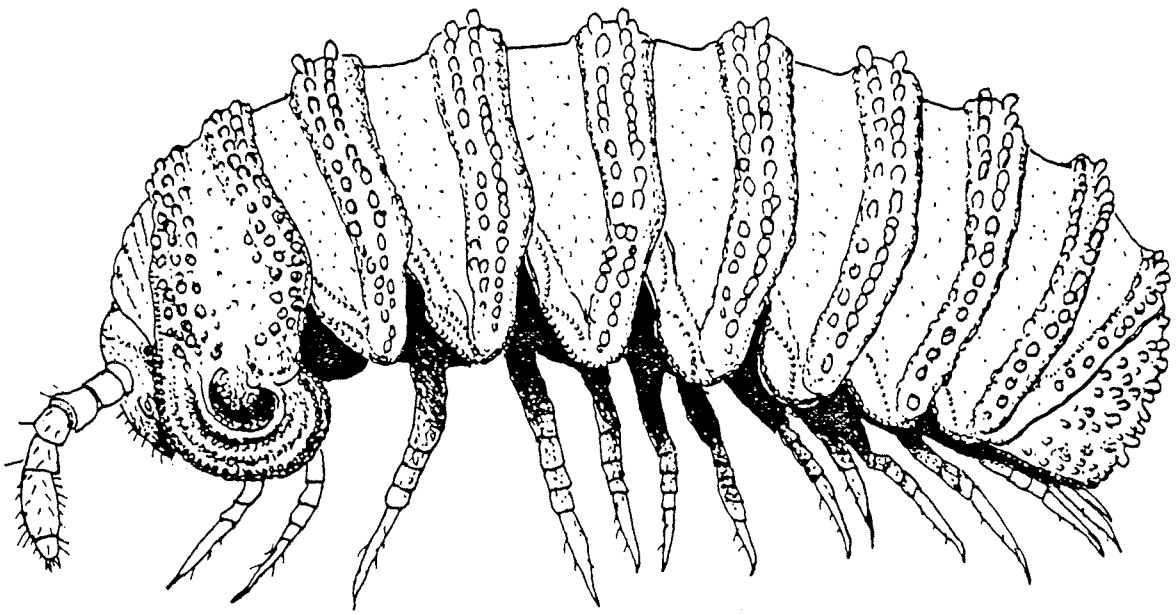

Fig. 1 Trachysphaera lobata (Ribaut) from Brading, Isle of Wight, 1984 (length 4 mm)

Tergite eleven, the telson, is rounded with a shallow sub-terminal groove. It is covered with tubercules distributed more or less randomly except along the hind edge where they are in rows. It bears no prominent medial projections.

Ocelli are present in all stages examined, usually five in number in a vertical row down each side of the head and with the uppermost pair often side by side.

There are seventeen pairs of legs in the female. To date no males have been found. The largest individual recorded measured 4.1mm long x 1.9mm broad.

The only other species recorded from Britain likely to cause confusion are Stygioglomeris crinita Brölemann and Adenomeris gibbosa Mauriès. S. crinita can be eliminated by its smooth tergites and lack of ocelli. A. gibbosa is more similar but has twelve tergites, also lacks ocelli, and has two prominent medial projections on the telson. It has only been recorded from Ireland (D. Doogue, unpub.).

Observations

T. lobata appears firmly established at Bembridge. The specimens were obtained from the soil of a small coastal woodland within a few metres of the high tide mark. The woodland is predominantly deciduous and is dominated by mature sycamore (Acer pseudoplatanus). The ground flora consists of blankets of ivy (Hedera helix) with nettle (Urtica dioica) and small patches of dog's mercury (Mercuralis perennis). The soil consists of sand with shingle and is acid (pH 5.5 - 6.0). At a depth of about 30 cm the sand gives way to clay. The woodland is bordered to the east by the sea and the west by a cliff of Bembridge Marl which attains a height of about 7m.

T. lobata has been found throughout the woodland, mainly in the soil, but one specimen was found in dead wood lying on the ground surface and another was sieved from litter. In the soil, densities of 28 per 0.005 cu. m. have been found. Specimens appear to be most common at a depth of about 15 cm. Ophiodesmus albonanus and the isopod Haplophthalmus danicus have also been obtained from the same soil by funnel extraction.

Since the initial discovery, one of us (A.N.K.) found a single specimen of T. lobata at the Duver, on the far side of Brading Harbour and the other side of the River Yar (40/637892), in September 1984. It was sieved from below leaf litter on sand in an area of scrub.

Discussion

T. lobata is known from as close as central France (Demange 1981). At Bembridge it gives every appearance of being native and the further record from the Duver indicates that if it is introduced it may have been established for a considerable period. There are no indications so far of a synanthropic association. Being so small it could easily have been overlooked and with diligent searching it may well be discovered in the south of England or Ireland.

So far no males have been found at either site and we conclude that in Britain reproduction is parthenogenetic although males are present in France. Ribaut's (1954) original description relies heavily on the structure of the male gonopods to separate T. lobata from T. pyrenaica (Ribaut). No males being available we had to rely for identification on features like the difference in shape of the ridges on the tergites, the number of rows of tubercules on tergites 7 - 10, and the form of the lateral depressions on the shield. Our specimens compare very favourably with figure given by Ribaut (1954). They key out in Demange (1981) as T. lobata but the colour plate attributed to that species cannot be relied upon.

Acknowledgements

We thank J-P. Mauriès for examining material for us and providing much information on this and similiar species. A.J. Rundle provided further information.

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PREDATION & PREY IN HENIA (CHAETECHELYNE) VESUVIANA (NEWPORT) (CHILOPODA, GEOPHILOMORPHA)

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There have been few field observations of predation and feeding by the chilopod, Henia vesuviana (Newport), principally for two reasons;

a) the relative rarity of this species in Britain
b) its nocturnal habits.

During September 1984, observations were made on this species both in the field and in the laboratory in an attempt to establish (a) the prey taken by this species and (b) the method(s) of predation.

The field observations were made at a site at Newport, Isle of Wight, grid ref. 40/498894, where H. vesuviana is known to be abundant. The site is situated in a suburban area and consists of a small area of waste ground bordered to the North by a disused railway viaduct, to the South by a stream, to the East by a wall and to the West by a car park.

To assist in these observations and to encourage the specimens of H. vesuviana to remain on the ground surface a number of boards were placed on the ground surface during the spring of 1984 and left "in situ" until these observations commenced. The boards consisted of "chip-board" which is capable of retaining a high percentage of moisture, thus providing an ideal micro-site for ground-living species requiring a high relative humidity. This method of observing H. vesuviana in the field proved to be satisfactory and consequently a small number of field observations were made.

Eight specimens of H. vesuviana were collected from other sites in the Isle of Wight and were kept separately in petri dishes in leaf litter over a base of damp plaster of Paris. Various organisms were introduced to the petri dishes in an attempt to see which would be taken by H. vesuviana as prey.

FIELD OBSERVATIONS

Generally, observations were made at the Newport site during the first hour after sunset on alternate days over a period of 18 days during September 1984. Areas of open ground were searched but there was no evidence of *H. vesuviana* attacking or eating prey in such areas. The underside of each board was examined resulting in six observations of *H. vesuviana* eating prey. There were no observations of *H. vesuviana* attacking prey in such sites.

The following observations of prey type were made:

Earthworm, sp. unknown on three occasions
Fly larva, sp. unknown on one occasion
Fly larva, Tipulidae sp. on one occasion
Isopoda, *Porcellio scaber* on one occasion.

LABORATORY OBSERVATIONS

The eight specimens of *H. vesuviana* kept under laboratory conditions were given organisms at infrequent but regular periods, dependent on the size of the organism offered as prey and whether such organisms were accepted as prey, or rejected. In the case where an organism was rejected as prey by one specimen of *H. vesuviana* it was introduced to a second specimen to test whether the rejection was valid or otherwise. In any case, organisms offered as prospective prey were left 'in situ' for a period of 48 hours before being removed and a different organism introduced.

Organisms introduced and attacked or eaten

Enchytraeid worms (species unknown)
Isopoda (*Porcellio scaber*, *Armadillidium vulgare*, *Philoscia muscorum*, *Trichoniscus pusillus*)
Tipulidae larva (species unknown)
Whitefly (Aleyrodidae sp.)
Greenfly (Aphidoidea sp.)
Arachnida (*Dysdera* sp. - small, 4mm)
Bristle tails (Thysanura sp. and Diplura sp.)
Mollusca (*Cepaea* sp., *Arion* sp., *Deroceras* sp.)
Earthworms (sp. unknown)

Organisms introduced but rejected as prey

Arachnida (Dysdera sp. - 7mm long)
Dermaptera (Forficula auricularia, Forficula lesnei)
Diplopoda (Brachydesmus superus, Cylindroiulus punctatus, Ommatoiulus sabulosus, Polydesmus angustus, Polymicrodon polydesmoides, Tachypodoiulus niger, Chordeuma sp.)
Ants (sp. unknown)
Opilione (Nemastoma bimaculatum, Platybunus triangularis)
Beetle larvae (sp. unknown)

Observations on the method of predation

In most cases it was possible to observe the specimens of H. vesuviana attack and eat the prey offered. Generally the prey was examined by the specimens of H. vesuviana by tapping it with the distal article of the antennae. Occasionally the H. vesuviana would draw its antennae through its forcipules after having tapped the prey, either to 'taste' the prey or to cleanse the antennal articles. H. vesuviana is known to have a small depression on the distal antennal article which contains a number of 'thin walled' basiconic sensilla, which are probably the organs of 'taste' or 'smell'. Having identified the organism as prey, the H. vesuviana moves forward and bites into the organism with its forcipules. In the case of small organisms i.e. enchytraeid worms, whitefly, greenfly and bristletails they are immediately transferred to the oral field where feeding commences immediately. The enchytraeid worms and the greenfly were devoured almost entirely, with only small sections of the exoskeleton being discarded. The whitefly and the bristle-tails were only partially devoured, leaving the greater part of the exoskeleton.

No observations were made of the method of attack employed by H. vesuviana against the Isopoda. However, feeding on Isopoda was observed, and took place through the ventral surface of the Isopod just anterior to the pleon. The exoskeleton of the Isopoda was discarded entirely, the body contents appearing to be devoured by pre-oral digestion.

The small arachnid (Dysdera sp.) was attacked from beneath as it passed over the litter in which the H. vesuviana was concealed. It was bitten on the ventral surface of the thorax and was obviously injected with venom from the poison claws. The Dysdera was immediately incapable of escape

and thrashed about for some 27 seconds until it was overcome by paralysis or death. During this time the centipede had withdrawn into the leaf litter and only emerged when movement of the prey had ceased, moving forward to examine the prey with the distal articles of the antennae. After a short examination of the prey during whcih the antennae were drawn through the oral field, the centipede moved forward on to the now exposed ventral surface of the spider and commenced feeding through a slit in the thorax. The centipede made no attempt to force its head into the wound but was observed to be feeding on the body fluids leaking from the wound. The period of feeding lasted for about 9 minutes. The Tipulid larva was approached by the centipede and a short examination was made of the prey with the antennae The larva was then bitten with the poison claws, causing it to thrash about and to expand the contract its body. The centipede again withdrew from the prey whilst it was thrashing about, but remained in close proximity until the larva was subdued. The centipede then moved forward and appeared to search for the site where it had first bitten the larva, consequently finding the wound and then enlarging it. The centipede then forced its head capsule inside the wound in the larva, having first folded the antennae back over the head, thus keeping the distal articles of the antennae away from the feeding site. Feeding commenced and continued for 23 minutes, followed by a period of cleaning of the antennae and the oral area.

When earthworms are introduced as prey, H. vesuviana examines them with the distal articles of the antennae and then bites into the mid-trunk section of the worms causing the worm to thrash about. In all but one case the H. vesuviana remained attached to the worms until they were subdued. Small species of earthworm (about 25mm) are subdued quite rapidly whilst large specimens (about 100mm) do not fully succumb to the centipede's venom but seem incapable of escape. Feeding often commences before the prey is totally incapacitated. The centipede's head capsule is again forced inside of the trunk, with the antennae being held back over the head capsule.

The mollusca were attacked and eaten by the same method employed as in the case of the earthworms. Surprisingly the H. vesuviana were not deterred by mucus secretions of the mollusca.

When the diplopoda were introduced to H. vesuviana they were examined with the distal articles of the antennae after which the centipede withdrew

under the leaf litter and showed no further interest. Diplopoda would not be expected to be prey for H. vesuviana because of their heavy exoskeleton which could not be pierced by the centipede's forcipules.

The large arachnid (Dysdera sp.) was introduced to a H. vesuviana and immediately attacked the centipede by grasping it in the mid-trunk region. The H. vesuviana squirmed about until after some 20 seconds the spider dropped it and withdrew, apparently cleaning its chelicerae. It is probable that the spider's chelicerae had become coated with a secretion from the sternal pore areas on the centipede's trunk. The animal withdrew under the leaf litter and adopted a 'defensive' posture i.e. curled, with the sternites displayed outwards.

The two species of earwig (Forficula auricularia and Forficula lesnei) were "tasted" with the centipede's antennal tips, followed by the centipede withdrawing under the leaf litter.

Ant species caused centipedes to adopt the defensive pose described above when they walked over it. There were no attempts made by the centipedes to attack the ants. On several occasions, ants which came into contact with a H. vesuviana withdrew and spent time cleaning their legs and antennae.

In the cases of the opilione spiders and the beetle larva the centipedes involved had no contact but immediately withdrew into the leaf litter and remained concealed. No attempt was made to attack any of these relatively large predaceous animals.

Summary

Henia vesuviana specimens were given various organisms which it was thought would be present in the same microsites as the centipedes. Notes were then made of the reaction of H. vesuviana to this prospective prey and, where possible, on the method of predation used by H. vesuviana. The method of predation on various organisms is described as is the defensive posture adopted by H. vesuviana when threatened or attacked.

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SOME MYRIAPODS FROM BRITTANY

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The Breton fauna is of particular interest to students of British myriapods being likely to have similarities to that of south and south-west England and southern Ireland and it seems useful to place on record some recent information.

1. Collected S. Peters, det. A.N. Keay
(reported by A.N. Keay in B.M.G. Newsletter, November 1983)

Hedgerow litter, by a camp site about 6.5 km (4 miles) from Brest (22.iv.83):
Lithobius variegatus Leach, one female
Lithobius microps Meinert, two females

2. Collected P.T. Harding

a. Pine-oak wood above La Mataile (9.vi.83):
Schendyla nemorensis C.L. Koch
Geophilus carpophagus Leach

b. Dune heath with scrub, Carnac Plage (12.vi.83):
Líthobius forficatus L.

3. Collected R.E. Jones

Rock crevices, partly filled with shell fragments, Pelvetia zone, La Trinité sur Mare, Carnac (10.vi.83):
Hydroschendyla submarina (Grube), numerous specimens.

3. Collected A.D. Barber, K.R. Barber:

a. South of Toulhoat, south side of Montagnes Noir, on D769 (Department of Finistere) roadside (18.viii,85)

i) stones on old road surface,

Brachygeophilus truncorum (Bergsoë & Meinert)
Lithobius piceus L. Koch ♀
Lithobius muticus C. Koch ♀
Glomeris marginata (Villers)

ii) stones on soil

Lithobius forficatus immature
Lithobius calcaratus C. Koch ♂♀
Lithobius crassipes L. Koch ♀
Lamyctes fulvicornis Meinert 8♀♀

iii) mixed woodland, S.E. facing, dead wood

Geophilus carpophagus ♀♀ and juveniles
Cryptops hortensis Leach
Lithobius melanops Newport ♀♀
Glomeris marginata

b. Roscoff, under stone on path in town (18.viii.85):

Lithobius forficatus

Of the twelve species of chilopod and one diplopod recorded, most are widespread in both France and the British Isles but some are of particular interest. H. submarina is relatively poorly recorded in Britain but this is possibly due to difficulty in sampling habitats such as the one described.

Of the Lithobiomorpha, both L.piceus and L. muticus have a restricted distribution in Britain, being apparently confined to the South East whereas in France they are widespread, the former as "France Septentrionale, Alpes" and the latter as "Commun partout" (Demange, 1981). Interestingly, L. fulvicornis which is widespread in Northern Europe is described by both Brolemann (1930) and Demange (op.cit.) as "Pyrenees au-dessus de 1000 m, Allier". It has, however recently been recorded from Dordogne (Barber, in litt.).

Thanks are due to those who collected the specimens described, to Dr. E.H. Eason for his examination of certain lithobiids and to A.N. Keay for permission to quote his record of L. variegatus.

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GEOPHILUS PROXIMUS C.L. KOCH (CHILOPODA, GEOPHILOMORPHA) AND OTHER CHILOPODA FROM THE SHETLAND ISLANDS

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No published records of myriapoda exist for the Shetland Islands although Hammer and Henriksen (1930) reported four species from the Faeroes. Two species of diplopod, Cylindroiulus latestriatus (Curtis) and Proteroiulus fuscus (Am Stein) are known from Shetland (C.P. Fairhurst, Myriapod Survey Scheme, unpub.) and nine chilopods are here recorded including one, Geophilus proximus C.L. Koch apparently new to the British Isles.

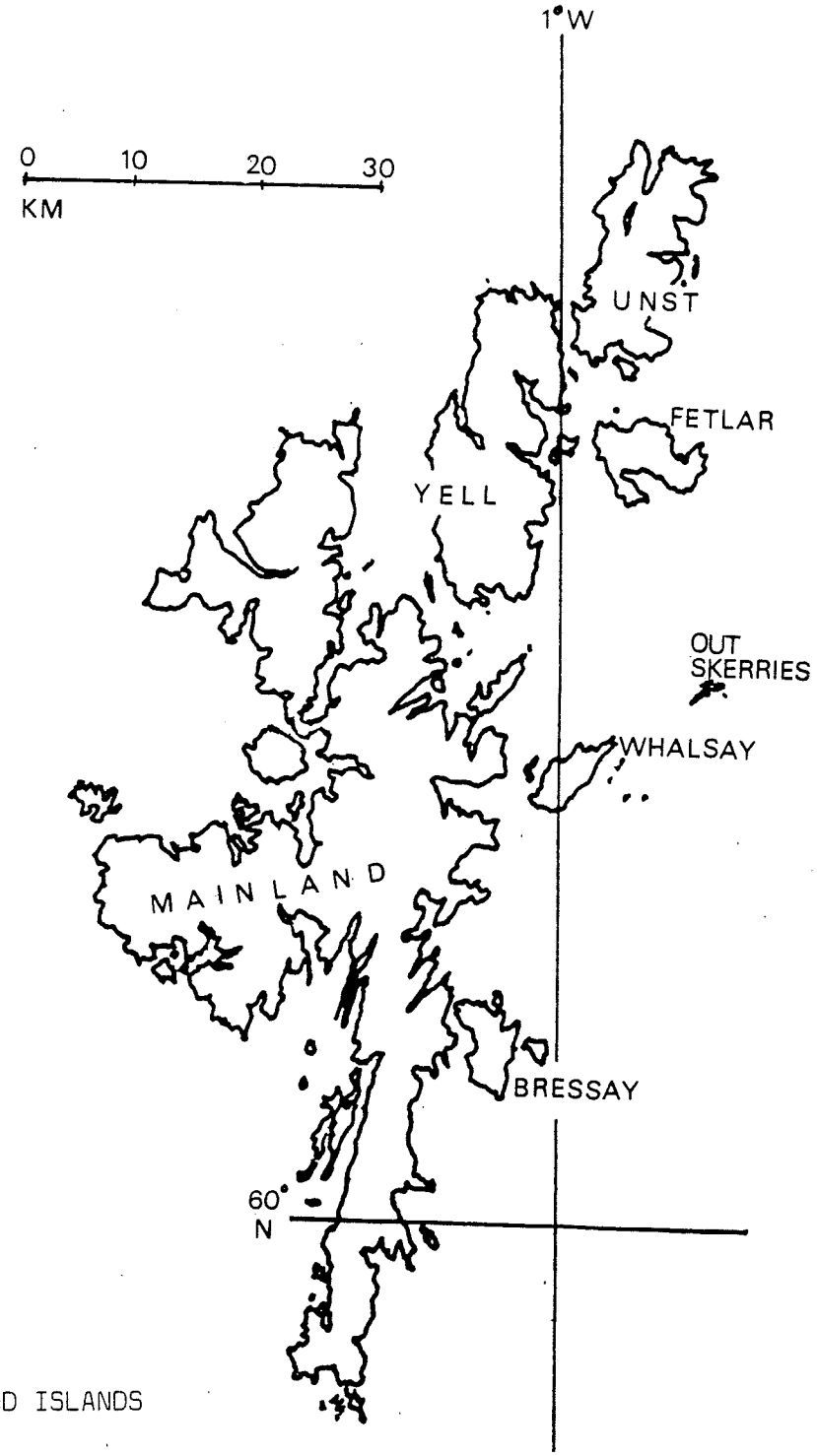
The Shetlands are an archipeligo of islets and islands, over 100 in number lying between 50°50' and 60°52'N and 0°55' and 2°14'W. The principal island is Mainland; Yell, Unst and Fetlar lie to the North, Whalsay and Bressay to the East and Muckle Roe and Foula to the West (Map 1). The coast of the islands is extensively dissected and no part of the area is more than about 5 km from the sea. The surface cover is largely moorland and peat rising to 450 m at the highest point.

Collections were made in 1974 by two groups. A team from Merlewood Research Station, Grange over Sands, collected animals as part of a broad ecological survey of the islands (indicated M) and Dr. N.P. Ashmole of Edinburgh University (indicated A) obtained further specimens. Approximately 90 animals in total were collected but some were unidentifiable due to damage or to an immature state. Collections were made on Mainland (M, A), Yell (M), Unst (M, A), Bressay (M) and Fetlar (A) and from the Out Skerries (Housay, Grunay and Bruray Islands, M). There is also a single record of Strigamia maritima (Leach) from Mainland made in 1977 by M. Jones.

Seven species are recorded from Mainland and from Unst, one from Bressay, three from Fetlar and two from Out Skerries. The only specimen from Yell was an immature, probably Lithobius borealis Meinert (det. E.H. Eason). The distribution by islands is given in Table 1. 10 km National grid squares are given for each species.

SPECIES	Mainland	Unst	Bressay	Fetlar	Yell	Out Skerries		
						Grunay	Bruray	Housay
Schendyla nemorensis	X	X				X	X	
Strigamia maritima	X							
Geophilus proximus		X						
Geophilus insculptus		X						
Brachygeophilus truncorum	X			X				
Lithobius forficatus	X	X				X	X	X
Lithobius melanops	X	X		X		?		
Lithobius borealis	X	X	X	X	?			
Lamyetes fulvicornis	X	X						

TABLE 1. SPECIES RECORDED FROM VARIOUS ISLANDS



MAP 1: THE SHETLAND ISLANDS

SPECIES RECORDED

Order GEOPHILOMORPHA

Schendyla nemorensis C.L. Koch

Specimens of this small geophilomorph are recorded from Usta Ness, under stones on limestone grassland (24.7.74, M), Bruray, maritime grassland (11.9.74, M), Grunay, under stones in short grass turf (8.9.74, coll. G. Durrant, M), Haroldswick, recently disused serpentine quarry, 3 specimens (19.8.74, M).

10 km records: HP61, HU48, 67

Strigamia maritima (Leach)

Records of this common littoral centipede are from North Voe of Clousta, large numbers along shore of brackish lagoon (3.7.74, M), Whiteness Voe, high on shore in Xanthoria zone (9.8.74, M) and from the same general area (M. Jones, 8.77).

10 km records: HU34, 35

Geophilus proximus C.L. Koch

A single female with 49 pairs of legs is recorded from near Queyhouse, Unst (HP 602113) under boulders in bottom of nettle-grown hollow in a limestone hillock covered in closely grazed turf, close to the shore of the freshwater Loch of Cliff; sheep bones were piled in amongst the turf (20.8.74, M).

10 km record: HP 61

Geophilus insculptus Attems

A species widespread in Britain, this is represented by specimens from Halligarth near Baltasound, Unst in a small sycamore (Acer pseudoplatanus L.) wood, one of the few woods on Shetland. It is a small walled enclosure with trees over 100 years old, a closed canopy 5-8 m up and with bare, crumbly, loose soil beneath (11.7.74, A; 26.8.74, M).

10 km record: HP 60

Brachygeophilus truncorum (Bergsø & Meinert)

A small species collected from two sites; soil from sheep grazed grassland near Brindister (19.7.74, M) and rocky moor, Rooin Hill, Fetlar (25.6.74, A).

10 km records: HU 25, 69

Order LITHOBIOMORPHA

Lithobius forficatus (L.)

One of the commonest centipedes over most of Britain, some 14 specimens are recorded in total; Calluna hillside, storm beach, near derelict croft, old woodpile, quarry, roadside, etc.

10 km records: HP 44, 46, 50, 61, 67
HU 25, 35

Lithobius melanops Newport

A species usually separated from the next by the presence of broad posterior projections on tergite 9 and the absence of the additional prefemoral spine of the 15th legs, it is nevertheless separated from it with great difficulty in some Shetland specimens. Thanks to the work of Dr. E.H. Eason it has been possible to assign names to most specimens of these two species.

Definite records are from North Voe of Clousta (two males, 3.7.74, M) - a steep hillside facing south covered with a close turf composed almost entirely of Calluna and a very dry, thin soil; Sandwick, Unst (7 specimens in all, males and females, 19.8.74, M) - under stones and old wood behind a sandy foreshore; Halligarth (one male, 11.7.74, A) - sycamore wood; Quendale (one female, 2.7.74, A) - calcareous sand dunes with marram grass; Fetlar (one male), rocky moor.

A male, only 8.5 mm long, almost adult with 9 setae on each side of the first genital sternite, well developed tergite 9 and no supplementary spine on the last legs was collected on the surface of ground near occupied buildings at Brindister (3.4.74, M) and is presumably this species, another male from Grunay, under rocks embedded in short turf, (8.9.74, M) is possibly this species and an immature female from Sandness Hill (30.6.74, A) is rather large for L. borealis and could be this species.

10 km records: HP 60 HU 31, 35, 69

Lithobius borealis Meinert

Shetland specimens of this species tend to show distinct broad projections on tergite 9 although these are not necessarily as large as those on the preceding species. A similar phenomenon has been observed in animals from Sutherland (E.H. Eason, pers. comm.). This leaves the accessory spine on the 15th legs as the distinguishing character; damaged or immature animals may be impossible to diagnose with certainty.

The species seems to be widespread in Shetland with records from Keen of Hamar, Unst (11-13.7.74, A), Nikka Vord, Unst (12.7.74, A), Noup of Noss (24.6.74, A), North Roe (17.7.74, A), Fetlar (22.7.74, A), Rooin Hill, Fetlar (24.7.74, A), Bressay (28.6.74, M), near Brindister (2.7.74, M), near Stockhoul, Unst (18.8.74, M), Haroldswick, Unst (25.8.74, M). Most of the records are associated with peat moorland.

A possible specimen of this species is from Yell (14.8.74, M), a second instar larva.

10 km records: HP 51, 60, 61
HU 38, 53, 69

Lamyctes fulvicornis Meinert

11 specimens of this species are recorded, all from Mainland or Unst; Lochend (in public hall, 11.7.74, A), Hill of Colvadale (heath, 12.7.74, A), Brindister (loose stones in dry seepage area, 30.6.74, M), near Gonfirth (Calluna heath, peat, 13.8.74, M), near Stockhoull, Unst (peat gully, 18.8.74, M), near Queyhouse, Unst (almost bare serpentine area, 20.8.74, M), Haroldswick, Unst (wet hillside, sparse grass, 25.8.74, M), near Lunna (roadside, Calluna heathland, 2.8.74, M), Lock of Cliff (damp ground, beach, 22.8.74, M).

10 km records: HP 51, 60, 61
HU 25, 36, 38, 46

DISCUSSION

1. GEOPHILUS PROXIMUS

A number of older British workers refer to this species (e.g. Evans, 1907, Johnson, 1912) and Schubart (1963) quotes Scotland for it but Eason (1964) considers that all old British records should in fact be referred to G. insculptus. The animal from Unst would therefore seem to represent the first British record of this species.

The animal has certain similarities with other geophilids, notably G. insculptus and G. fucorum Brolemann but is distinguished from the latter by the smooth poison claw, the smaller number of trunk segments and the larger terminal claws on the last legs. In addition G. fucorum would appear to be entirely littoral in Britain.

The similarities with G. insculptus are more marked, in particular the general appearance, the number of trunk segments and the large carpophagous fossa and the two have been much confused (Meidell, 1969). The differences are however fairly clear, notably the presence of a normal claw rather than a peg on the second maxillae and the absence of a single isolated coxal pore on the terminal legs. Diagrams of these two features are given by Enghoff (1971). In addition, the pore area on the sternites is described as diamond shaped and the mid-piece of the labrum as having a single tooth (Brolemann, 1930). On the Shetland specimen, the pore areas vary somewhat on different sternites; some might be described as spindle shaped rather than diamond but they are ill-defined. The labral mid-piece is difficult to distinguish; there are three teeth centrally but is not easy to determine whether the lateral ones arise from the side pieces; one of them bears a definite fimbria. The fimbriae on the side pieces resemble Brolemann's description clearly, broad at the base and contracted sharply mid way (op.cit. fig. 240).

Brolemann quotes the species as "France septentrionale (trouve en Seine-Inferieure par M.H. Gadeau de Kerville). Europe septentrionale." but his drawings are after Chalande of a specimen from Brandenburg. Demange (1981) seems to repeat the information "France septentrionale; Seine-Maritime".

There are numerous records from Nothern Europe; Denmark (Enghoff, 1971, 1983), Norway (Meidell, 1969), Sweden (Lohmander, quoted in Meidell), Easter Fennoscandia (Palmen, 1948), Eastern Baltic (Trauberg, quoted in Palmen), North Germany (Verhoeff, quoted in Meidell). It is also reported from Hungary and Romania? (Schubart, 1963) and from two areas in the Netherlands (Jeekel, 1977). Its occurrence in Shetland fits in with a northerly distribution.

Both Enghoff and Meidell refer to the synanthropic tendencies of G. insculptus compared to G. proximus. G. insculptus is certainly not restricted to synanthropic sites in most of Britain where it is widespread but is interesting that the known Shetland site is an enclosed woodland near a settlement. Possibly the two species compete with G. insculptus being the southern, G. proximus the northern forms; the occurrence of southern species in synanthropic sites has been remarked elsewhere (Barber, 1985) and Meidell (1979) comments on the fact that the great area convered by G. proximus might possibly be explained as a combination of great vagility and parthenogenetic reproduction.

2. OTHER SPECIES

Clearly the limited amount of material available means that almost certainly some species may have been missed accidentally but the absences from the list are themselves of interest. Apart from generally southern species such as Haplophilus subterraneus (Shaw), Cryptops spp. and Lithobius microps Meinert the most obvious absences are of the widespread British species Lithobius crassipes L. Koch and Lithobius variegatus Leach, both of which are common animals in open country in much of mainland Britain (other than the eastern areas in the case of the latter species).

Meidell (1979) lists the Norwegian chilopods according to their distribution and it is interesting to compare his data with ou Shetland records (Table 2). Of the species he considers as indigenous to Norway, Pachymerium ferrugineum C.L. Koch has been once recorded from southern Britain, possibly a chance introduction and not from western Norway. Lithobius erythrocephalus C.L. Koch and L. tenebrosus fennoscandius Lohmander are not reliably known from Britain and are very rare in western Norway. L. curtipes C.L. Koch is known from scattered English

SPECIES	W. Norway	Rest of Norway	Indigenous/ Anthropochorous	Shetland Islands	Mainland Scotland
Haplophilus subterraneus					+
Schendyla nemorensis	X	X	I	+	+
Strigamia crassipes		(x)	A?		+
S. maritima	X	(x)	I	+	+
Pachymerium ferrugineum		X	I		
Geophilus carpophagus		(x)	A		+
G. electricus	(x)	x	(A)		+
G. proximus	X	X	I	+	
G. insculptus	(x)		(A)	+	+
Necrophloeophagus longicornis	X	X	A		+
Brachygeophilus truncorum	X	(x)	I	+	+
Cryptops hortensis		(x)	A		+
Lithobius variegatus					+
L. forficatus	X	X	I	+	+
L. melanops	X	X	I	+	+
L. erythrocephalus	(x)	x	I		
L. borealis	(x)	x	I	+	+
L. macilentus	(x)	(x)	AI		+
L. tenebrosus	(x)	(x)	I		
L. calcaratus					+
L. crassipes		(x)	(A)		+
L. curtipes	(x)	X	I		
L. microps	(x)	(x)	A		+
Lamyctes fulvicornis	X	X	I	+	+

TABLE 2. SHETLAND AND NORWEGIAN SPECIES
(Modified after Meidell, 1979)

X = common x = rare (x) = very rare + = recorded I = indigenous
A = anthropochorous (in Norway)

records but not from Scotland, it is very rare in western Norway and appears to be largely eastern in Denmark (Enghoff, 1983). L. macilentus C.L. Koch (very rare in Norway) is known from scattered sites over much of Britain.

Nerophloeophagus longicornis (Leach) is a widespread and frequent animal in Britain and might be expected to occur in Shetland but, excluding Strigamia maritima a total of only ten identifiable geophilomorphs were collected so its absence from our records may be due to chance.

CONCLUSIONS

Overall the Shetlands fauna would appear to consist of Lithobius forficatus as the large lithobiid, frequently associated with human activity, L. melanops apparently also at least in part synanthropic, L. borealis as the common open country species (rather than L. crassipes) together with Lamyctes fulvicornis a species widespread in Northern Europe. Geophilomorphs, because of the small number collected, cannot be quite so easily fitted into a general pattern but Geophilus proximus would seem a distinctly northern element in the fauna.

Clearly further collecting could yield other species, possibly some of those referred to above and it would be most useful to have further collections made in Shetland, Orkney and North-East Scotland.

ACKNOWLEDGEMENTS

Thanks are due to Dr. J. Darlington (I.T.E., Merlewood Research Station) and to Dr. N.P. Ashmole for the collections made, also to Dr. E.H. Eason for much patience in his examination of Lithobius melanops/borealis specimens, his comments and his confirmation of Geophilus proximus and to Dr. H. Enghoff of Copenhagen for the loan of a specimen of that species.

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Bulletin of the British Myriapod Group 3 (1986)

CENTIPEDES - PROGRESS TOWARDS THE PROVISIONAL ATLAS, AND BEYOND

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The Centipede recording scheme was set up in 1970 as one of a trio of schemes organised in conjunction with the Biological Records Centre (BRC). The three schemes (Centipedes, Millipedes and Non-marine Isopoda) used specifically designed recording cards, which incorporated a habitat recording system, aimed to provide basic information on habitat preferences as well as the customary information on geographical distribution for the British Isles.

Three publications have already used results from the Centipede Recording Scheme; Fairhurst, Barber and Armitage (1978) described the scheme and examined the influence of altitude first order habitats and soil on the occurrence of centipedes; Barber (1984) reviewed records of centipedes from Ireland and Barber (1985) gave a preliminary account of the distribution of 34 non-maritime species in the British Isles with special attention to factors influencing the occurrence of Lithobius variegatus.

All records received by the recording scheme, up to the end of 1984, have now been deposited with BRC and entered on computer file. The complete data set consists of nearly 16,000 records of 47 species derived from over 10,000 record cards. The taxonomic validation of records was by Tony Barber, assisted in recent years by Andy Keay. Checking of data input was by Andy Keay and I was assisted by Mary-Clare Sevatman and James Brooks with the checking and standardisation of locality/grid reference information. All computer editing and analysis done at BRC, using the DEC PDP 11/34 mini-computer was done by Dorothy Greene, assisted by Christine Bennett. Programs for the analysis of habitat data were written by Jeff Moller of NERC Computing Services.

During January 1986 the complete data set was sorted and analysed to produce draft 10 km square distribution maps of Britain and Ireland, listing of all records for each species and analyses of the habitat data. These maps, listings and analyses were available for a two-day meeting at the beginning of February 1986 between the authors of future Provisional Atlas (Barber & Keay) and BRC (Harding). Each draft map was reviewed and compared against the listings of records; a small number of anomalous records was traced and will be corrected on the computer files. The habitat analyses were also examined and prospects for their use discussed.

As a result of this recent meeting it has been agreed that BRC will arrange for the Institute of Terrestrial Ecology to publish a Provisional Atlas of Centipedes in the British Isles (by Barber & Keay) later in 1986. A draft synopsis of the atlas and the format and content of the species accounts to accompany each distribution map have been agreed. The authors plan to make use of the habitat data for each species as simple percentage occurrences in the species accounts, but it is also intended that more detailed analyses of the habitat data will be made for a future publication. It is hoped that the complete data set can be copied in machine-readable form to Salford University, to enable Colin Fairhurst to continue the analysis of habitat and related data.

Now that the data from the first phase of the Centipede Recording Scheme are on file at BRC, it is possible to provide contributors and users with lists of records from the computer. Lists are available in two basic forms:
1. as lists of all records for each species, sorted by 10 km squares;
2. as lists of all records (arranged by species) for a geographic area (e.g. a vice-county, 100 km square or 10 km square). Most records include locality names, many of which add considerably to the usefulness of the records by naming, for example, nature reserves, National Trust properties and landscape features such as woods, heaths and moors.

The Centipede Recording Scheme continues as before, but using the RA58 record card. Supplies of cards are available, free of charge for use with the scheme, from BRC (address above). Completed cards and specimens for identification should be sent to Tony Barber.

Acknowledgements

I am very grateful to Tony Barber and Andy Keay for their patient co-operation throughout the processing of the Centipede data and special thanks to Andy for relieving me of all the input checking. The success of the recording scheme has, of course, been largely dependent on the industry and enthusiasm of the recorders.

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Distribution and variation of the species of Brachychaeteuma occurring in Britain and Ireland

by

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Early this century the family Brachychaeteumatidae, with the single genus Brachychaeteuma, was a wholly British (and initially northern English) group. All of the three species now standing as British had been described by 1918. Now there are no more than twenty vice-county records of all three species of which ten have been made during the last ten years; there are also very few records of the genus on the continent and each of the authors reporting its occurrence have commented on the paucity of material.

Like all chordeumatidans, Brachychaeteuma exhibits much intraspecific variation in the form of the gonopods, principally in the anterior processes of the modified limbs of the eighth pair of limbs, the gonopods proper. Most of this variability has been described in material from continental Europe. The discovery of a variant during the spring meeting at Lancaster in 1983 provides the occasion for a review of the present situation.

The British and Irish species and their known distribution

The first two of the three species listed below have a mainly northern range; they are externally indistinguishable; each has three ill-defined ocelli on either side and in one variant they are lacking. The third species is strictly southern in its range; it has six more obvious ocelli.

Brachychaeteuma bagnalli

This was the first species of the genus to be described.

1. Durham (vc 66), Gibside, Bagnall (1911), described by Verhoeff (1911) Three further Durham localities in 1918 (Bagnall, 1919)
2. Yorkshire, North Riding (vc 62) Easingwold, garden 1956 and again 1961 by Blower.
3. Dublin (H21), Ballygall, Declan Doogue 1978 in a cornfield on the site of an old deserted garden at St. Clare's Hospital.

4. Lancashire, mid (vc 60), Gait Barrows, near Silverdale, by Adrian Rundle, 1983
5. Westmorland, (vc 69), Meathop Wood, 1983. Tony Barber had two males; one of them was a normal bagnalli the other was the variant discussed below.

These five vice-county records represent all we know of the distribution of B. bagnalli. For 27 years the species was not known outside Britain and even now we know of only two records, from caves in Belgium and north west Germany (Schubart, 1938)

Brachychaeteuma bradeae

This was the second species to be found in Britain.

1. Lancashire, south (vc 59), Darwen, Whitehall Park and in other gardens in the town (Brade-Birks, 1917).
2. Lancashire, north (vc 69), Barrow in Furness, Brade-Birks (1918 A)
3. Norfolk, west (vc 28), Heacham, Chiver's nurseries, Brade-Birks (1920)
   Norfolk, west (vc 28), Barroway, Drove, collected by Adrian Baker, 1970
4. Somerset, south (vc 5), survey record
5. Sussex, east (vc 14), survey record
6. Lancashire, mid (vc 60), in the grounds of St. Martin's College, Adrian Rundle, 1983

George Fussey also had the species from Meathop (vc 69) at the Lancaster meeting in 1983.

B. bradeae was originally described as Iacksoneuma bradeae by Brolemann and Brade-Birks in honour of A. Randall Jackson. It differed in several respects from the genus Verhoeff had described to house bagnalli, principally in the presence of three ocelli and paranotal lobes; Verhoeff's description of bagnalli as being blind and without paranotal lobes was found to be at fault by Brade-Birks (1918 A). Brade-Birks re-examined the types and found them to have ocelli and lobes; bradeae was thus transferred to the genus Brachychaeteuma with characters amended.

Outside Britain variants of B. bradeae have been described from Sweden and Germany. The Swedish examples were described from Lund, Visby and Kalmar, in graveyards and gardens, by Lohmander (1925) as varieties B. bradeae: var. truncata (Fig 2) and elongata (Fig 4). The German animals include examples from Pasing in Bavaria, found and described by Verhoeff (1925) as B. bluncki (Fig 3) and from Berlin in the Botanic Garden and a cemetery

as B. verhoeffi by Schubart (1930). Lohmander, (pers. com. to Schubart, 1934) later found there was no significant difference between his varieties truncata and elongata and the Berlin examples of B. bluncki and B. verhoeffi respectively. Lohmander said that all these forms could be found in the same place and were probably just forms of one highly variable species. Yet another form, B. bradeae hussoni (Fig 6) was described by Schubart and Husson (1936) from caves in north east France. Schubart gave the form sub-specific status in the absence of knowledge of whether it was geographically isolated from the other forms.

Brachychaeteuma melanops

This was the third of the species to be discovered, by Bagnall;

1. Dorset, (vc 9), Swanage, 1918; described by Brade-Birks (1918 B)
2. Devon, south (vc 4), Torquay and Babbacombe, Bagnall (1919)
3. Cornwall, east,(vc 2) Polbathic, Turk (1943)
   Tintagel, Rocky Valley, Blower, in 1963
4. Kent, west (vc 16), garden, J.L.Harding, 1967
5. Surrey (vc 17), in three separate km squares, Kime (1978)
6. Sussex, west (vc 13), one square, Kime (1978)
7. Monmouth (vc 35), OtterHole Cave, near Chepstow (Chapman, 1979)

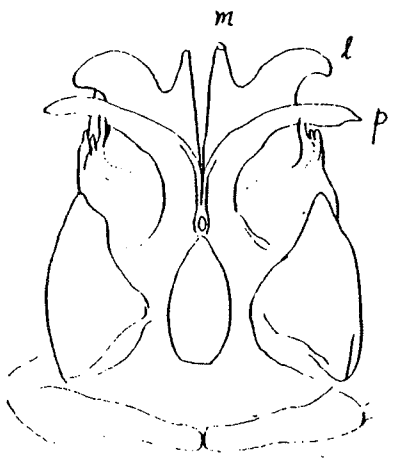
Outside Britain the species has only be found in France: near Pau by Brolemann (1935) as B. melanops horticola and from six departments, mostly in caves (Demange, 1981). Turk (1943) said that his male example resembled Brolemann's sub-species.

The new variant, BMG 1983 (Fig 5)

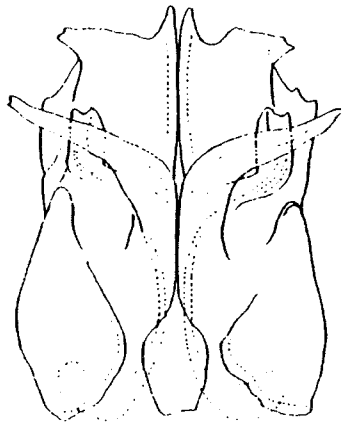
In addition to adding two more vice-county records to the existing three for B. bagnalli and one more for B. bradeae, the Lancaster meeting turned up a new form. One of the two specimens collected by Tony Barber at Meathop was a typical B. bagnalli (Fig 8), the other was the BMG variant, but it is not immediately evident to which species it should be attached. I have arranged the known forms in Figs 1 to 8 to help decide the issue; I am not suggesting that the arrangement is in any way definitive.

In the upper row of figures are the forms with very little mesial division between the anterior processes of the gonopods. Forms along the row differ in the extent and manner of separation between the median and lateral processes of each side.

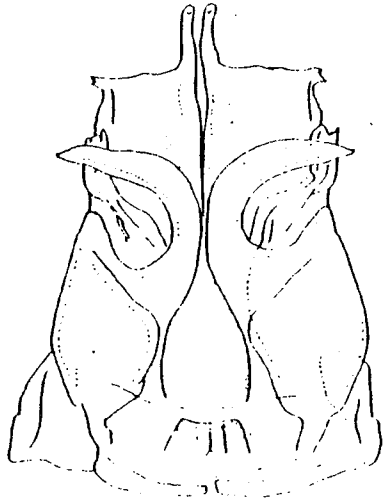
1 ***B. bradeae***
(U.K.)



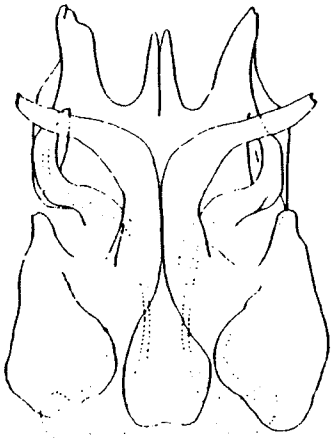
2 ***var. truncata***



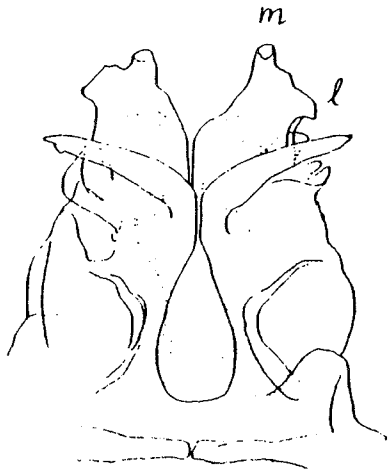
3 ***var. bluncki***



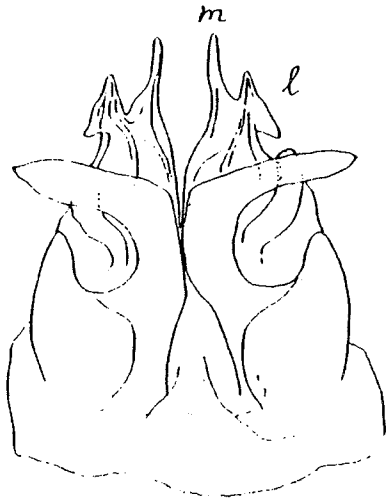
4 ***var. elongata***
(=verhoeffi)



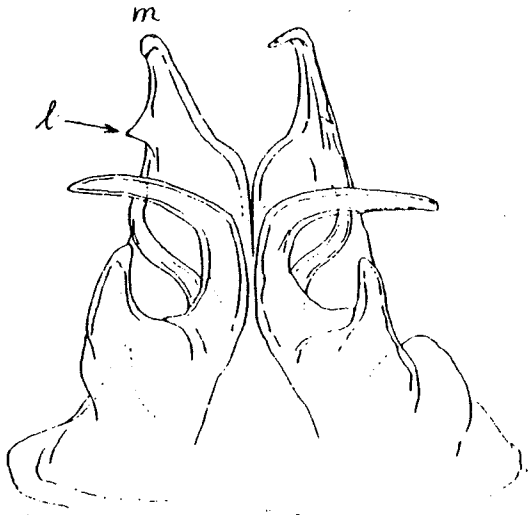
5 ***var. B.M.G. 1983***



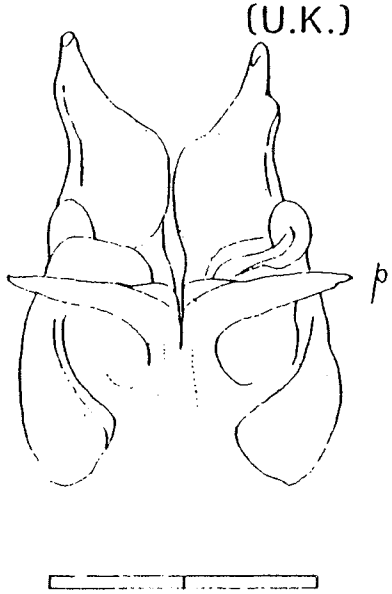
6 ***bradeae hussoni***



7 ***B. bagnalli***
(N.W. Germany)



8 ***B. bagnalli***
(U.K.)



In the lower row, all the forms show a more marked separation between the left hand process or processes, and those of the right hand. Along the row, from left to right, the figures show a gradual reduction of the lateral processes and their eventual elimination (in bagnalli U.K.). It is of course possible to read the sequence from right to left and see the gradual appearance and development of lateral lobes as branches of the median lobes of bagnalli, from the lateral tooth in bagnalli from north west Germany, through B. bradeae hussoni to BMG variant. The beginning of (or end of) a lateral lobe can just be imagined in bagnalli U.K. Other examples of bagnalli from Britain and Ireland do not show this lateral shoulder. The more obvious triangular tooth-like processes of north west German examples (Fig 7) are, according to Schubart (1938) completely missing in English and Belgian examples.

The typical bradeae form as in Fig 1 is also the form of the example from Darwen figured in Blower (1958) and of the male from Drove in Norfolk. The typical bagnalli form is very similar to figure 8 (without the shoulders) and is also the form of Brade-Birk's original male and those from Yorkshire, North Riding and from Dublin.
B. herrioti Demange, 1962 is similar to B. bradeae hussoni and comes from caves in Meurthe-et-Moselle. Five other species of Brachychaeteuma are figured by Demange (1981) from French caves.

Conclusion

A logical argument is developed which suggests affinity of the new variant with B. bagnalli. The same argument suggests that hussoni should be attached to B. bagnalli rather than to B. bradeae. However, intuition leads one to the view that the new form is a variety of B. bradeae. Examination of further examples may add to the idea of a very variable bradeae-bagnalli species, or may suggest the new variant is merely an aberration of the normal bradeae pattern. For the moment, nothing is to be gained by associating the variant with either bradeae or bagnalli.

Figures 1 - 8

Posterior views of the gonopods (limbs 8) of typical, varietal and subspecific forms of Brachychaeteuma bagnalli and B. bradeae.

1. Collected G. Fussey, Meathop, vc 69, April 1983
2, 3 & 4. Figures 368, 369 & 370 respectively, from Brolemann (1935) redrawn to the same scale.
5 & 8. The two males collected A.D.Barber, Meathop Wood, vc 69, April 1983.
6. Figure 2 of Schubart & Husson (1937) redrawn to same scale.
7. Figure 1 of Schubart (1938) redrawn to same scale.

m, l, anterior median and lateral lobes; p, posterior lobes

The scale is 0.2mm long.

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