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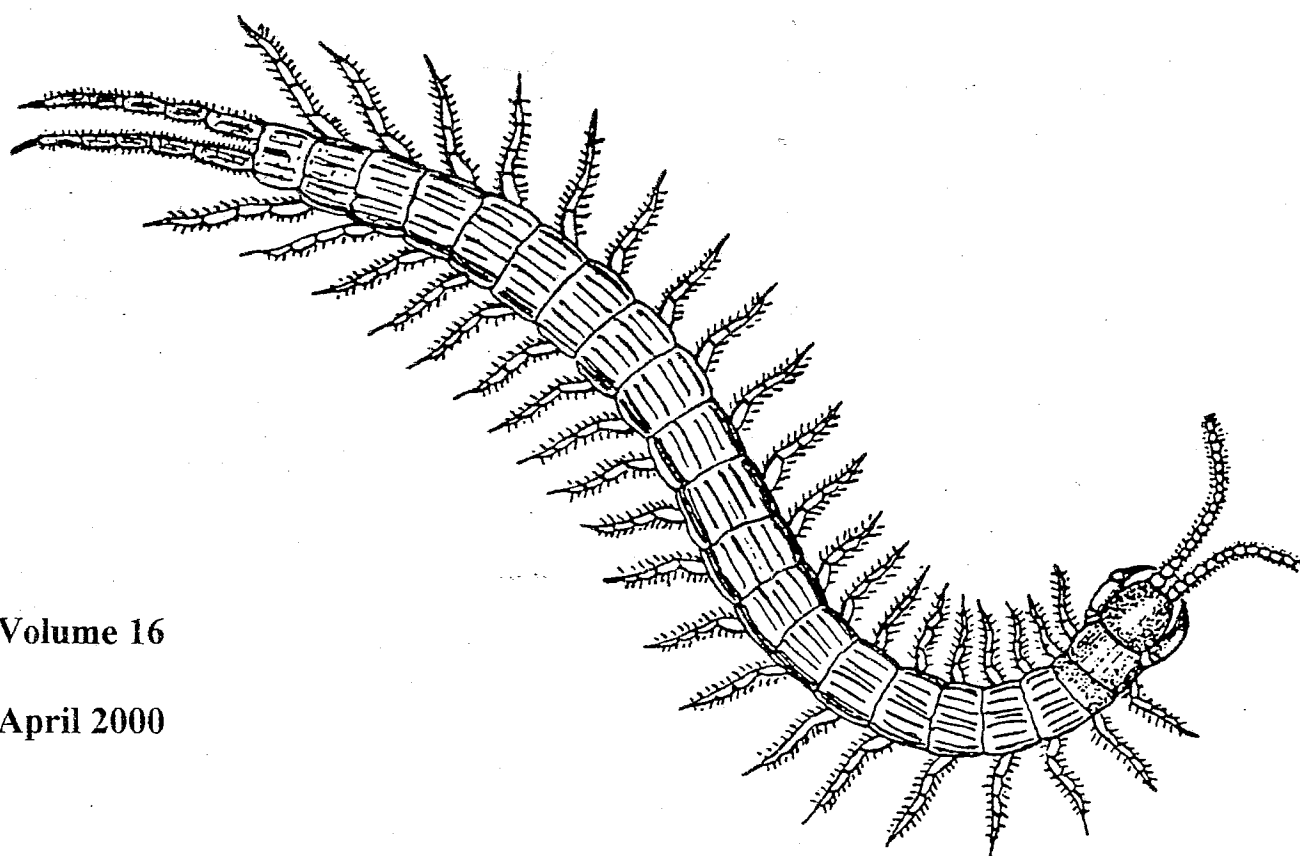
# **BULLETIN** **of the** **BRITISH** **MYRIAPOD** **GROUP**

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Edited for the Group by  
A.D.Barber  
and  
H.J.Read

Volume 16

April 2000



# BULLETIN OF THE BRITISH MYRIAPOD GROUP

Volume 16  
2000

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## EDITORIAL

The present time represents a watershed in myriapodological studies and in the history of the group with the death, just before Christmas 1999, of Ted Eason. In addition we have a planned formalising of the group together with the British Isopod Study Group as the British Myriapod and Isopod Group.

Ted Eason, whose obituary and list of papers appears elsewhere in this volume was not only a naturalist with an enormous number of meticulous and ground-breaking studies of myriapods, especially centipedes, to his name but a most knowledgeable and helpful supporter of others working in the field. All who had contact with him spoke of his rapid and careful response to letters and requests and his answers are full of valuable detail. One of the present authors first had contact with him in the later 1960s where both his book, *Centipedes of the British Isles*, and his considered and helpful responses spurred an interest.

The Myriapod Group (There was discussion of the name at the beginning with various titles being suggested) first met together at Brendon in North Devon in April 1970 with a dozen people present including Gordon Blower, Ted Eason, John Lewis, Colin and Joan Fairhurst and Desmond Kime. One of the present editors shows his age but admits being present as well. The group went on to meet several times more but then there was a lapse in formal meetings until 1982 when, with the enthusiasm of Ron Daniel, a meeting took place in what is now Plymouth University. From then on, joint meetings with the Isopod Group have taken place each year in a different venue.

The Bulletin was first published for the Manchester Congress in 1972 but, despite a planned second volume, lapsed until 1985, appearing more or less annually ever since.

Despite this period of apparent inactivity, the two recording schemes went on collecting data, which emerged in various publications.

In recent years there has been much talk, some initiated by Paul Harding of a single organisation, more formally constituted covering myriapods, isopods and possibly other "minor" groups and a working party has been looking at this and possible benefits. One of the points always made by the myriapod people has been that they do not exist solely to serve a recording scheme, important though that is and that myriapodological studies have a clear international dimension through CIM (Centre Internationale de Myriapodologie). However, 2000 sees the planned formal first meeting of the group at Saffron Walden. The hope is that being a more formally constituted "society" will give us added strength to make representations, attract funding, etc. However one of the strengths of the "old" group has been its very informality so we seek to chart a mid course between a highly rigid and formal organisation and apparent anarchy.

Our sister publication, *Isopoda*, ran for several years but has not appeared recently and there has therefore been no forum for isopod papers comparable to the Bulletin. This is Volume 16 of the Bulletin of The British Myriapod Group. We are not sure what

the title of Volume 17 will be! It is planned to carry isopod (and terrestrial amphipod) papers but none were forthcoming for the present volume.

In fact, readers may note the relative thinness of this issue; this is, unfortunately, due to a lack of appropriate material coming forward and, if we are to continue until 2015 would possible authors please take note! Another feature of this volume is the inclusion of a meeting report, in this case, on west Cornish centipedes. At the last meeting it was agreed that such reports should be transferred from the Newsletter to the Bulletin to ensure more formal publication. In fact, Volume 1 carried reports on the two field meetings that had taken place by that date.

Other papers are some useful reports on species from Ireland by Martin Cawley, a still under-recorded country, especially for centipedes, and some ideas on microscopical preparation of geophilomorphs from our Argentinean colleague, L.A.Pereira together with notes on our *Cryptops* species to complement earlier keys on Lithobiomorpha and Geophilomorpha. To complete, many of us have wondered why Americans have "millipeds" whilst we have "millipedes"; Richard Hoffman tries to shed some light on this.

As the Group, in whatever morph, moves into the new millenium, I offer from Roland Brown's entry on Myriapod in his book on the composition of scientific words (thanks to Richard Hoffman) :

"Teacher : what is a millenium ?"

"Student : it is something like a centennial, but has more legs"

## OBITUARY

**EDWARD HOLT EASON M.A., M.B.(Cantab.), F.L.S.**  
**1915-1999**

Dr Edward Eason was born at Holmes Chapel in Cheshire in 1915, the son of a Manchester cotton broker. From an early age he was keen on natural history and country pursuits. He attended Malvern College where he came under the influence of Theodore Savory, the biology master, already a well-known naturalist and a student of the Arachnida. Edward was riding with the Cheshire hounds at 18. He went up to Cambridge, Pembroke College and joined the OTC Cavalry squadron. He read Medicine at Cambridge and completed his medical training at University College, London.

Dr. Eason served in the RAMC in India and Burma during the war and trained in field ambulances; he was in charge of horses and mules; he trained the animals, and the men to swim and has alarming tales of crossing the Irrawaddy, Chindwin and other rivers both in advancing and again in retreat. Dr. Eason had a critical mastoid operation as a youth. His deafness suffered during the harsh conditions of the campaign and he was invalided out to the Field Laboratory of Tropic Diseases at Maymya. Not with standing his disability and arduous active service he found time to make observations on hunting wasps, dung beetles and tree ants. These were subsequently published in the Proceedings of the Cotteswold Naturalist's Field Club (1975). After the war Dr. Eason served as a civilian pathologist for a few years but this was not to his taste and his deafness precluded General Practice.

After his marriage to Vivian Haynes in 1948 he took up farming and occupied Bourton Far Hill in the Cotswolds. I first met Edward in Manchester after we had begun corresponding, shortly after his paper on *Lithibius aulacopus* as new to Britain from near Windermere in the Lakes. Soon after I had the pleasure of visiting Ted and Vivian on their farm. He showed me his laboratory and also we had a tour of the farm. They specialised in beef cattle and horses. My visit came shortly after one of their horses, Airs and Graces, ridden by Sheila Wilcox, won the Badminton horse trials in 1959. Both Ted and Vivian rode with the hounds. Ted was an advocate and practitioner of natural farming, using as few inorganic fertilisers as possible and retaining horse power for the ploughing.

The first of three landmarks in Dr. Eason's rise to pre-eminence in the study of Chilopoda was the publication of his monograph Centipedes of the British Isles Frederick Warne, 1964, pp294, 490 Figs, 5 Plates, which still remains the standard work; originally priced at £3.3.0 and now on the rare occasion that a copy comes on the market, will be priced at around £80. The book is notable for the great care and precision of the authors own figures and text. It is dedicated to Theodore Savory, for inspiring him with an interest in Arthropoda.

The second landmark was the award in 1980 of the Stamford Raffles Prize for amateur research, by the Zoological Society of London for "distinguished work on the taxonomy of centipedes". At this time, Eason had published 27 papers including

species from Siberia, Hawaii, Seychelles, Sardinia and Majorca. In a paper presented to the second International Congress of Myriapoda in Manchester in 1972 on Certain Aspects of Generic Classification of the Lithobiidae with Special Reference to Geographical Distribution Eason writes "A revised classification of the Lithobiidae is obviously required but will be a vast undertaking....a compromise between the lumping of Attems and the splitting of Chamberlain....should enable the Lithobiidae to make their due contribution to zoogeographical knowledge".

The third landmark, or rather phase, consisted of a further 28 publications based on collections from Papua, Macaronesian Islands, Afghanistan, Thailand, Nepal, Sri Lanka, Falkland Isles, Kurile Islands and European countries. These papers go a large part of the way to completing the 'vast undertaking' he referred to in 1974. The last paper, on Kirghizia and Kazakhstan, he says "is my swan song....shall not be writing more as my eye sight and manual dexterity are both failing" – this note in his 82<sup>nd</sup> year!

Dr Eason attended many of the International Congresses in Myriapodology; to many of these we travelled together and I valued his amiable companionship. The last I remember was our trip to Innsbruck in 1990. This included a lightening dash between Paddington and Victoria (Ted was 75) just catching the last train to Moreton-in-Marsh; I stayed the night at Bourton Far Hill; the next day he took me on a tour of the trees he had planted, partly as a means of earning a little semi-retirement from farming.

Many students of the Chilopoda, from many parts of the world visited Bourton Far Hill. Both Ted and his visitors enjoyed the newly sylvan aspect of much of his land. It is with deep respect and admiration that many of his friends will bid their farewells to our elder Statesman of Myriapodology. Dr Eason leaves a daughter, Marian and a grandson.

J. Gordon Blower

**E.H. EASON**

**LIST OF PUBLICATIONS**

1. 1951. Notes on the Chilopoda (Centipedes of Warwickshire & Worcestershire). *Ann. Mag. nat. Hist.* (12) 4: 257-268.
2. 1953. Centipedes (Chilopoda). *Proc. Cotteswold Naturalists' Field Club.* 31: 61-62.
3. 1953. On *Lithibius aulacopus* Latzel, a centipede new to Britain. *Ann. Mag. nat. Hist.* (12) 6: 850-854.
4. 1957. The centipedes (Chilopoda) of East Sussex. *Hastings & East Sussex Naturalist.* 8: 204-210.
5. 1957. Chilopoda and Diplopoda from Caernarvonshire. *Proc. Zool. Soc. Lond.* 129: 273-291.
6. 1958. Millipedes (Diplopoda) and Centipedes (Chilopoda). *Proc. Cotteswold Naturalists' Field Club*, 3pp.
7. 1958. Notes on the Diplopoda of Warwickshire and Worcestershire. *Ann. Mag. nat. Hist.* (13) 1: 90-96.
8. 1961. On the synonymy of some British centipedes. *Ann. Mag. nat. Hist.* (13) 4: 385-391.
9. 1962. The chilopod genus *Nesoporogaster* Verhoeff. *Proc. Zool. Soc. Lond.* 138: 123-132.
10. 1964. *Centipedes of the British Isles*. London: Warne. Pp I-x, 1-294, 495 figs.
11. 1965. On *Lithobius tricuspis* Meinert (Chilopoda, Lithobiomorpha) in Britain. *Ann. Mag. nat. Hist.* (13) 8: 285-295.
12. 1970. The Chilopoda and Diplopoda of Iceland. *Entomol. scand.* 1: 47-54.
13. 1970. A redescription of the species of *Eupolybothrus* Verhoeff, s.s. preserved in the British Museum (Natural History) and the Hope Department of Entomology, Oxford (Chilopoda, Lithobiomorpha). *Bull. Br. Mus. nat. Hist. (Zool)* 19: 287-310.
14. 1970. On certain characters used to separate species and subspecies in the Lithobiidae. *Bull. Mus. natn. Hist. nat.* 41 Suppl. No. 2: 58-60.

15. 1970. Eason, E.H. On *Brachyschendyla dentata* Brol. Et Rib., a centipede new to Britain. *J. nat. Hist.* **4**: 79-84. With A.D. Barber.
16. 1972. The type specimens and identity of the species described in the genus *Lithobius* by George Newport in 1844, 1845 and 1849 (Chilopoda, Lithobiomorpha). *Bull. Br. Mus. nat. Hist. (Zool)*. **21**: 297-311.
17. 1972. The type specimens and identity of the species described in the genus *Lithobius* by C.L. Koch and L. Koch 1841-1878. *Bull. Br. Mus. nat. Hist. (Zool)*. **22**: 105-150.
18. 1973. The type specimens and identity of the species described in the genus *Lithobius* by R.I. Pocock 1890-1901 (Chilopoda, Lithobiomorpha). *Bull. Br. Mus. nat. Hist. (Zool)*. **25**: 41-83.
19. 1974. On certain aspects of the generic classification of the Lithobiidae, with special reference to geographic distribution. *Symp. zool. Soc. Lond.* No. **32**: 65-73.
20. 1974. The type specimens and identity of the species described in the genus *Lithobius* by F. Meinert and now preserved in the Zoological Museum, Copenhagen University (Chilopoda, Lithobiomorpha). *J. Linn. Soc. (Zool)*. **55**: 1-52.
21. 1975. On Lithobiidae from Majorca with a description of a new species of *Lithobius* (Chilopoda: Lithobiomorpha). *J. nat. Hist.* **2**: 445-456.
22. 1976. The type specimens and identity of the Siberian species described in the genus *Lithobius* by Anton Stuxberg in 1876 (Chilopoda, Lithobiomorpha). *J. Linn. Soc. (Zool)*. **58**: 91-127.
23. 1976. Eason, E.H. The identity of the species described by F. Fanzago and G. Fedrizzi from 1876 to 1881 (Chilopoda: Lithobiomorpha). *Fragm. entom.* **12**: 183-205. With A. Minelli.
24. 1977. On *Lithobius melanops* in North America. *Ent. mon. Mag.* (1976) **112**: 65-66.
25. 1977. A redescription of the type specimens of *Lithobius hawaiiensis* Silvestri, 1904 with a note on the Hawaiian Lithobiidae. *J. nat. Hist.* **11**: 485-492.
26. 1978. On Lithobiidae from the Seychelles with description of two new species of the subgenus *Australobius*, genus *Lithobius* (Chilopoda, Lithobiomorpha). *J. Zool. Lond.* **184**: 21-34.
27. 1978. The effect of the environment on the numbers of trunk segments in the Geophilomorpha with special reference to *Geophilus carpophagus* Leach., In Camatini, M. (Ed). *Myriapod Biology*. London: Academic. Pp. 233-240.



28. 1980. On Lithobiidae from Sardinia (Chilopoda: Lithobiomorpha). *Bull. Zool. Mus. Univ. Amsterdam* 7:125-131.
29. 1980. Zoological results of the British Speleological Expedition to Papua New Guinea: 1975. A new species of the sub genus *Australobius*, genus *Lithobius*, from Papua New Guinea. *Myriapodologica* 1: 41-46.
30. 1981. On some new and little known Southern Asiatic species of Lithobiidae. *Entomol. scand.* 12: 327-338.
31. 1982. A review of the northwest European species of Lithobiomorpha with a revised key to their identification. *J. Linn. Soc.* 74: 9-33.
32. 1983. The identity of the European and Mediterranean species of Lithobiidae described by K. W. Verhoeff and now represented by material preserved in the British Museum (Natural History). *Zool. J. Linn. Soc.* 77: 111-144.
33. 1984. The Lithobiomorpha of the Macaronesian islands. *Entomol. scand.* 15(3): 387-400.
34. 1985. On the status of *Lithobius carinipes* Daday, *L. californicus* Dady and *L. filicium* Attems; three little known Nearctic species of Lithobiidae. *Myriapodologica* 2: 1-6.
35. 1986. On the synonymy of *Lithobius giganteus* Sseliwanoff, 1881 and the taxonomical status of *Porabius* Attems, 1926. *Ann. Naturhist. Mus. Wien* 87(B): 181-192.
36. 1986. On the Lithobiidae from Afghanistan with descriptions of three new species of the subgenus *Ezembius*, genus *Lithobius*. *Steenstrupia* 12(2): 49-60.
37. 1986. The Lithobiidae of Thailand with descriptions of six new species of *Lithobius* and a new subspecies of *Australobius feae* (Pocock, 1891). *Steenstrupia* 12: 129-151.
38. 1986. On the distribution of *Lithobius variegatus* Leach and the identity of *Lithobius rubripes* Newport. *J. Nat. Hist.* 20(1): 23-30.
39. 1987. A secondary sexual character in *Lithobius crassipes* L. Koch in Miscellanea. *Bull. Brit. Myr. Grp.* 4: 52.
40. 1989. Lithobiidae from the Nepal Himalayas with descriptions of ten new species of *Lithobius* and *Australobius*. *Zool. Jb. Syst.* 116: 353-372.
41. 1990. On *Lithobius sitianus* Chamberlin. A cavernicolous centipede from Crete. *Frag. Entomol. Roma* 22(2): 257-264.
42. 1990. On the true identity of *Geophilus insculptus* Attems, 1895. *Bull. Br. Myr. Grp.* 7: 3-4.

43. 1991. Distribution of the centipedes *Lithobius obscurus* Meinert and *L. peregrinus* Latzel. *Ent. mon. Mag.* **127**:23.
44. 1991. A new species of centipede, *Lithobius (Monotarsobius) blascoi* n.sp. from Spain. *Misc. Zool.* **15**: 179-183.
45. 1992. On the identity of *Lithobius cateivagus* Verhoeff and *Hessebius matsakisi* Matic & Stavropoulos. *Biologia Gallo-Hellenica* **19(1)**: 75-76.
46. 1992. On the taxonomy and geographical distribution of the Lithobiomorpha. *Ber. nat. med. Verein Innsbruuck Suppl.* **10**:1-9.
47. 1992. The Lithobiomorpha of the Canary Islands. *Entomol. Scand.* **23**:1-9. With H. Enghoff.
48. 1992. Indigenous centipedes from Azorean caves and larva flows. *Zoological Journal of the Linnean Soc.* **105**:407-429. With N.P. Ashmole.
49. 1993. Description of four new species of *Lithobius* from the oriental region and a re-description of *Astrolobius palnis* (Eason, 1973) from Sri Lanka. *Boll. Mus. civ. St. nat. Verona* **17**: 181-200.
50. 1993. A new species of *Anopsobius* from the Falkland Islands with commentary on the geographical distribution of the genus. *Myriapodologica* **2**: No. 12: 83-89.
51. 1993. Displacement of the male secondary sexual characters in *Lithobius calcaratus* C.L. Koch and other species of *Lithobius*. *Bull. Br. Myr. Grp.* **9**: 21-23.
52. 1994. *Lithobius quadridentatus* Menge, 1851, the senior synonym of *L. piceus* L. Koch, 1862. *Bull. Br. Myr. Grp.* **10**: 49-50.
53. 1995. Opinion 1516. *Lithobius piceus* L. Koch: Specific name conserved. *Bulletin of Zoological Nomenclature* **52(3)**: 278.
54. 1996. The rediscovery of *Australobius scabrior* Chamberlin. *Australian Entomologist* **23**: 91-92.
55. 1996. Lithobiomorpha from Sakhalin Island, the Kamchatka peninsula, and the Kurile Islands. *Arthropoda Selecta* **5**: 117-123.
56. 1997. On some Lithobiomorpha from the mountains of Kirghizia and Kazakhstan. *Arthropoda Selecta* **6**: 117-121.

## MYRIAPOD (CHILOPODA AND DIPLOPODA) NOTES FROM SOME IRISH OFFSHORE ISLANDS

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### INTRODUCTION

The primary purpose of this article is to give details of myriapod collections which I made on 4 Irish offshore islands, Cape Clear, Inishmore, Tory and Ireland's Eye, in recent years. The opportunity has also been taken to collate and briefly review all other available Irish island myriapod records. I have been able to trace records from a total of 15 islands, a surprisingly large number, given that these groups have received very little attention from Irish naturalists. Many of these records were made during the late 19th and early 20th centuries, by G. H. Carpenter, W. F. Johnson and S. M. Selbie. In most cases information consists of incidental observations of the larger species. An exception however concerns Clare Island, Co Mayo which was surveyed intensively during the Clare Island Survey 1909-1911. The myriapods of the island were dealt with by Johnson (1912). I have summarised all available offshore records in Table 1.

### RESULTS

#### CAPE CLEAR ISLAND, WEST CORK

I visited Cape Clear Island for 2 days in August 1996. Unfortunately the visit coincided with a period of almost incessant rain and so my myriapod recording was not as thorough as had been hoped. This is one of the best known Irish islands from a natural history point of view. It has been the site of a bird observatory since 1959, and many of the visiting ornithologists have been involved in recording the flora and invertebrate fauna. These records were collated by Sharrock (1973), and there are also scattered non-ornithological notes in the *Cape Clear Bird Observatory Reports*, but it appears that no information has been gathered on the myriapods. The plants include a number of Irish rarities, notably the hairy bird's-foot trefoil, *Lotus subbiflorus* Lag. The flora of the islands of Roaringwater Bay, including Cape Clear, has been reviewed by Akeroyd *et.al.* (1996). Cape Clear is quite a hilly island, and the soils are generally acid. The underlying bedrock is Old Red Sandstone. There are no woodlands on the island, the most interesting habitat being south facing coastal heaths. Most of the island lies in the 10km square V92, however a small portion just extends into V91. This portion represents, with the exception of nearby Fastnet Rock, the southernmost part of Ireland. The following myriapods were encountered on the island.

**Chilopoda:** *Schendyla nemorensis* (Koch) (3 records), *Strigamia maritima* (Lea record) *Geophilus carpophagus* Leach (1), *Necrophloeophagus flavus* (De Gee) *Cryptops hortensis* Leach (1), *Lithobius variegatus* Leach (3), *L. forficatus* (L) (1), *L. melanops* Newport (3), *L. microps* Meinert (3) and *Lamcytes fulvicornis* Meinert (1).

**Diplopoda:** *Glomeris marginata* (Villers) (3 records), *Cylindroiulus latestriatus* (C) (3) and *Polydesmus* sp. (1).

One interesting observation made was of numerous *G. marginata* apparently grazing the painted walls of a house at Cummer, V9521, having climbed about 2 metres from ground.

### INISHMORE, CO GALWAY

Inishmore is one of the three Aran Islands which lie across the entrance to Galway Bay. The other two islands are Inishmann and Inisheer. The islands are composed of carboniferous limestone, much of it present as bare fissured limestone pavement, represent a geological and botanical extension of the famed Burren region of north Co. Clare. They are included with that county (under vice-county H09) for the purposes of biological recording. The islands are home to a remarkable flora, which has been reviewed by Webb and Scannell (1983). Among the many noteworthy plants *Adiantum capillus-veneris* L, *Geranium sanguineum* L, *Helianthemum canum* Baumg., and *Gentiana verna* L, all of which are common on the islands. *Astragalus danicus* Retz. occurs nowhere else in Ireland. It seems clear that much work remains to be carried out on the invertebrates of the islands, however some interesting animals have been recorded including the endangered snail *Catinella arenaria* (Bouchard) Chantreaux and an distinctive subspecies, *alleneus* of the bumblebee *Bombus muscorum* (L). I visited the island between 19 and 21 July 1996. Rather surprisingly this visit coincided with a heat wave. While this made the fieldwork very pleasant, it proved quite difficult to turn up many heat sensitive invertebrates, including myriapods. There was however some rain on the night of 20th, and myriapods were found to be much more in evidence during a brief search on the morning of the 21st, prior to departure. I have been unable to trace any previous myriapod records from the Aran Islands. The following were the species which I collected.

**Chilopoda:** *Haplophilus subterraneus* (Shaw) (1 record), *S. maritima* (2), *C. hortensis* (1), *L. variegatus* (2), *L. forficatus* (4), *L. melanops* (2), and *L. microps* (2).

**Diplopoda:** *Nanogona polydesmoides* (Leach) (1 record), *C. latestriatus* (3), *Ophiulus pilosus* (Newport) (1), *Macrosterodesmus palicola* Brolemann (1) and *Ophiodesmus albonanus* (Latzel) (1).

At French Strand, L8809, I turned up a *Cryptops hortensis* dining on a *Lithobius forficatus*. The *Lithobius* was still alive although the base of its head was half severed by *Cryptops*. The apparent absence of small geophilomorphs from Inishmore is presumably a reflection of the unusual weather conditions. Available information would suggest that

*O. albonanus* and especially *M. palicola* are quite widespread on lime rich soils in Ireland Cawley (1997).

#### **TORY ISLAND, WEST DONEGAL**

Tory lies 14 kilometres off the north-west Donegal coast, and is the most remote of the inhabited Irish offshore islands. The island is covered with blanket bog and poor pasture, and there are a few small lakes. The blanket bog has been largely destroyed by peat extraction for fuel. The island is exposed to the full force of Atlantic gales and has a rather impoverished flora and fauna. Trees and brambles *Rubus* were among the plants which I noted as being entirely absent, as apparently, were many usually common landbirds and invertebrates. I visited the island between 31 August and 2 September 1996, and as the weather was quite pleasant for about half my stay I was able to carry out a reasonably thorough survey of the myriapods. The only species previously recorded from the island was *L. forficatus* (Selbie 1913). The following are the myriapods which I collected.

**Chilopoda:** *S. nemorensis* (4 records), *N. flavus* (2), *Brachygeophilus truncorum* (Bergsoë & Meinert) (4), *L. forficatus* (6), *L. melanops* (2), *L. borealis* Meinert (2), *L. crassipes* Koch (4) and *L. fulvicornis* (2).

**Diplopoda:** *C. latestriatus* (4 records), *O. pilosus* (1) and *Polydesmus inconstans* Latzel (1).

The *L. crassipes* record was the first for vice-county West Donegal (H35) and was listed as such by Cawley (1998). *P. inconstans* was found in association with a small refuse tip, and could be an introduction. A notable absentee was *L. variegatus*, although it is present on the Donegal mainland. I also failed to turn up any *Strigamia maritima*.

#### **IRELAND'S EYE, CO DUBLIN**

At about 25 hectares in area, Ireland's Eye was the smallest island visited, and also the closest to shore, being only 1km offshore from the Dublin city suburb of Howth. I visited the island, under ideal weather conditions, for 3 hours on 9 March 1999, primarily with the intention of generating myriapod records for this article. Most of this now uninhabited island is composed of rabbit grazed grassland, invaded by bracken and bramble. There is also some rock exposure, composed of Cambrian quartzites, and sheltered sandy ground around Carrigeen Bay. The island is managed by An Taisce, which is the Irish equivalent of the National Trust. Being so close to Dublin, Ireland's Eye has been visited by many leading Irish naturalists over the years, but so far as I can ascertain the only myriapod previously noted on the island is *L. variegatus*, based on an early 20th century record, which is plotted by Barber & Keay (1988). I encountered the following myriapods during my visit.

**Chilopoda:** *S. nemorensis* (2 records), *S. maritima* (1), *G. carpophagus* (1), *G. electricus* (L) (1), *N. flavus* (3), *C. hortensis* (3), *L. variegatus* (3), *L. forficatus* (4), *L. melanops* (2), *L. borealis* (2) and *L. microps* (2).

**Diplopoda:** *Blaniulus guttulatus* (Fabricius) (1 record), *C. latestriatus* (4), *B. superus* (2) and *M. palicola* (1). In addition specimens of a blaniulid millipede were collected from a rock fissure in the orange lichen zone at Rowan Rocks, O2941. It appears very likely that these refer to *Choneiulus palmatus* (Nemec), however as both of the specimens collected were adult female, this record must remain unconfirmed.

One specimen of *N. flavus* collected was dining on a small beetle larva. The *G. electricus*, *B. guttulatus* and *M. palicola* records came from under stones embedded in dark, enriched soil inside the ruins of an ancient church, which strongly suggests that these species were introduced by man to the island.

## DISCUSSION

The most important point to be remembered when considering the distribution of myriapods on Irish offshore islands is that while records are available from quite a number of islands, very few islands have been surveyed in anything approaching reasonable detail. In fact it is likely that only the Clare Island, Tory and Ireland's Eye lists are approximately complete. Notwithstanding this some patterns are beginning to emerge. It is clear that centipede faunas are relatively far more diverse on offshore islands than millipede faunas: approximately 60% of the Irish centipede fauna have been recorded on offshore islands, compared with about 30% of the millipede fauna. Presumably this is largely a reflection of the absence of woodlands from the islands, but it also suggests that centipedes are more adept at colonising islands than millipedes, and/or do better under the prevailing exposed conditions.

The most widespread centipede on Irish offshore islands is *L. forficatus* (recorded from 9 of the 15 islands from which details are available), followed by *L. variegatus* (8 islands), *L. melanops* (7), *S. maritima* (6), *S. nemorensis* (5), *G. carpophagus* (5), *N. flavus* (5), *C. hortensis* (5), *L. fulvicornis* (4), *L. microps* (3), *B. truncorum* (2), *L. borealis* (2), *H. subterraneus* (2), with the remaining species, *H. submarina*, *G. electricus*, and *L. crassipes* recorded from 1 island each. Comparing these results with the distribution table given by Cawley (1998) would suggest that *G. carpophagus* and *C. hortensis* are rather more frequent on the offshore islands than on the Irish mainland where they are both quite local. In fact *C. hortensis* appears to be a predictable member of the centipede faunas on the more southern offshore islands. It is clear also that *B. truncorum* and *L. microps* are distinctly less frequent on the islands than on the mainland. Also there are no island records for *Geophilus oligopus* (Attems) although it is widespread centipede on the mainland.

As far as the millipedes are concerned the only common island species appears to be *C. latestriatus* (5 islands). *B. superus* is also recorded from 5 islands, although it is generally less in evidence on islands than *C. latestriatus*. *G. marginata*, *O. pilosus* and *M. palicola* are each recorded from 2 islands, with the remaining species, *P. lagurus*, *N. polydesmoides*, *B. guttulatus*, *C. punctatus*, *P. angustus*, *P. inconstans*, and *O. albonanus* so far noted from only single islands. Clearly the island millipedes are quite a

hodgepodge of species, some of which are likely to have been introduced by man. Notable absentees are *Tachypodiulus niger* (Leach) and *Polydesmus gallicus* Latzel.

## ACKNOWLEDGEMENT

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## REFERENCES

- Akeroyd, J., Wright, L., Shockley, J., Clarke, K., Rowe, N., Hatch, P., Robinson, M., & Milner, B. (1996) *The wild plants of Sherkin, Cape Clear and adjacent islands of West Cork*. Sherkin Island Marine Station, Cork.
- Barber, A. D. & Keay, A. N. (1988) *Provisional atlas of the centipedes of the British Isles*. BRC, Huntingdon.
- British Myriapod Group (1988) *Preliminary atlas of the millipedes of the British Isles*. BRC, Huntingdon.
- Carpenter, G. H. (1895) Irish Field Club Union. Report of the conference and excursion held at Galway, July 11th to 17th, 1895. *Myriapoda. Ir. Nat.* **4**: 256.
- Carpenter, G. H. (1907) Contributions to the natural history of Lambay. Myriapods. *Ir. Nat.* **16**: 57.
- Cawley, M. (1997) Distribution records for uncommon millipedes (Diplopoda) including *Thalassisosobates littoralis* (Silvestri) new to Ireland. *Ir. Nat. J.* **25**: 380-382.
- Cawley, M. (1998) New Irish vice-county records for centipedes (Chilopoda). *Bull. Br. Myriapod Gp.* **14**: 10-17.
- Johnson, W. F. (1912) Chilopoda and Diplopoda. Clare Island Survey. *Proc. R. Ir. Acad.* **31** (33): 1-6.
- Jones, R. E. (1992) A collection of Irish myriapods. *Bull. Br. Myriapod Gp.* **8**: 9-12.
- Pocock, R. I. (1893) Notes upon some Irish myriapoda. *Ir. Nat.* **2**: 309-312.
- Selbie, C. M. (1912) Some new Irish myriapods. *Ir. Nat.* **21**: 113-115.
- Selbie, C. M. (1913) New records of Irish myriapods. *Ir. Nat.* **22**: 131-135.
- Sharrock, J. T. R. (1973) *The natural history of Cape Clear Island*. Poyser, Berkhamsted.

Webb, D. A. & Scannell, M. J. P. (1983) *Flora of Connemara and the Burren*. Royal Dublin Society and Cambridge University Press, Cambridge.

**TABLE 1**  
**SUMMARY OF MYRIAPOD (CHILOPODA AND DIPLOPODA) RECORDS**  
**FROM IRISH OFFSHORE ISLANDS\***

ISLAND	CCR	TEA	GBL	IMO	ITU	CLA	IMU	RUT	TOR	LM	EYE	X
<i>H. subterraneus</i>				*						*		
<i>H. submarina</i>						*						
<i>S. nemorensis</i>	*					*			*	*	*	
<i>S. maritima</i>	*	*		*		*				*	*	
<i>G. carpophagus</i>	*	*				*		*			*	
<i>G. electricus</i>											*	
<i>N. flavus</i>	*	*							*	*	*	
<i>B. truncorum</i>		*							*			
<i>C. hortensis</i>	*	*	*	*							*	
<i>L. variegatus</i>	*		*	*		*		*			*	**
<i>L. forficatus</i>	*	*		*		*			*	*	*	**
<i>L. melanops</i>	*			*		*		*	*	*	*	
<i>L. borealis</i>									*			
<i>L. crassipes</i>									*			
<i>L. microps</i>	*			*							*	
<i>L. fulvicornis</i>	*				*	*			*			
<i>P. lagurus</i>										*		
<i>G. marginata</i>	*					*						
<i>N. polydesmoides</i>				*							*	
<i>B. guttulatus</i>										*		
<i>C. punctatus</i>									*		*	
<i>C. latestriatus</i>	*			*			*		*			
<i>O. pilosus</i>				*					*	*		
<i>P. angustus</i>									*			
<i>P. inconstans</i>									*			
<i>B. superus</i>					*	*	*			*	*	
<i>M. palicola</i>				*							*	
<i>O. albonanus</i>				*								



\*Table 1 can be interpreted using the following key:

CCR = Cape Clear Island, West Cork. Source = M. Cawley (this study).

TEA = Tearaght Island, South Kerry. Source = Barber & Keay (1988).

GBL = Great Blasket Island, South Kerry. Source = Selbie (1913).

IMO = Inishmore, Aran Islands, vc Clare. Source = M. Cawley (this study).

ITU = Inishturk, West Mayo. Source = Johnson (1912).

CLA = Clare Island, West Mayo. Source = Johnson (1912).

IMU = Inishmurray, Co Sligo. Source = British Myriapod Group (1988).

RUT = Rutland Island, West Donegal, also known as Inishmacadura. Source = Barber & Keay 1988, based on late 19th century specimens in National Museum of Ireland.

TOR = Tory Island, West Donegal. Source = Selbie (1913) and M. Cawley (this study).

LM = Lambay Island, Co Dublin. Source = Carpenter (1907), Selbie (1912) and Barber & Keay (1988).

EYE = Ireland's Eye, Co Dublin. Source = M. Cawley (this study).

X = in order to save space I have grouped the following miscellaneous records into this column: *Lithobius variegatus* from Inishbofin, West Galway (Johnson 1912), and from Dalkey Island, Co Dublin (Pocock 1893), as well as *L. forficatus* from Bear Island, West Cork (Pocock 1893), and from Bills Rocks, 13km NW of Clare Island (Johnson 1912).

Excluded from this table are records for *Iulus luscus* Meinert from McDara's Island, West Galway (Carpenter 1895), Clare Island and Inishbofin (Johnson 1912), and Tory (Selbie 1913), as well as *Iulus teutonicus* Pocock from Great Blasket Island (Selbie 1913). These probably refer to *C. latestriatus*. A record for *C. britannicus* from Lambay Island is likely also to refer to *C. latestriatus* (Carpenter 1907). Also excluded are records from Achill Island, West Mayo, and from Valentia Island, South Kerry (Jones 1992) as both of these are now joined by road to the mainland.

**A NOTE ON THE MYRIAPODS (CHILOPODA AND DIPLOPODA) OF  
REENADINNA YEW WOOD, CO KERRY, IRELAND**

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**INTRODUCTION**

Killarney National Park comprises a diverse 10200 hectare area of woodland, mountain and lakes in Co Kerry, south west Ireland. It protects a wide variety of habitats the most notable of which are the largest remaining oak woodlands in Ireland. Yew *Taxus baccata* L. occurs as scattered trees throughout these woodlands, however at Reenadinna, on a peninsula between Lough Leane and Muckcross Lake, it forms an approximately 28 hectare relatively pure yew wood, the only one of its kind in Ireland. Such woodlands are apparently very rare in Europe, for example they are only recorded from 13 10km squares in Great Britain (Rodwell 1991). Reenadinna represents the only native coniferous woodland of any size in Ireland, although individual yew occurs fairly widely, and in a few places forms groves. At Reenadinna the yew grows on limestone rock, which in places is highly fissured, and through an abundance of limestone boulders. A dense carpet of the moss *Thamnobryum alopecurum* (Hedw.) covers both the limestone rock and boulders, and between the moss and rock surface there is a thin humus rich soil layer. The flora of the woodland has been documented by Kelly (1981), and is distinctly poor, both in terms of higher and lower plants, especially when compared to that of the Killarney oakwoods. There are scattered deciduous trees and shrubs, especially hazel *Corylus avellana* L. and holly *Ilex aquifolium* L. in the yew wood, and these become dominant where the bare limestone is replaced by soil, and where the ground is marshy. Other notable hardwoods present around the edge of the wood are the whitebeam *Sorbus anglica* Hedl., which is otherwise unknown in Ireland and the Kerry speciality *Arbutus unedo* L.. Some aspects of the ecology of the site have been studied by Carruthers & Gosler (1995) and Smal & Fairley (1982).

I visited the site on two occasions with the intention of assessing the centipede and millipede faunas. On each occasion I spent 3-4 hours searching for these groups in a variety of microsites as listed below. During the first visit, on 10 November 1999, I sampled an area on the northern side of Muckcross peninsula, centred on V959865. On the second visit, 2 December 1999, I searched a nearby area on the southern side of the peninsula at Kilbeg Bay, V955858. On each occasion I restricted my fieldwork to areas where the yew woodland was at its purest, and I took care to ensure that the only dead wood I examined were pieces of dead yew. Field observations were backed up by the collection of small bags of yew leaf litter, moss/soil from boulders, and moss from yew trunks, which were later examined at home. In fact owing to the proliferation of moss

there was very little available leaf litter, although some was collected from areas disturbed by deer, especially at the base of some of the larger trees. Much of the woodland showed signs of damage by deer, for example the stripping of bark from tree trunks. Apparently the introduced Japanese sika *Cervus nippon* Temminck are more responsible for this than the natives red deer *Cervus elaphus* L., which tend to stick to more open ground. It was quite noticeable that a fairly dense ground flora, especially of brambles *Rubus* sp. had developed in one place where deer were fenced out.

## **LIST OF MICROSITES AT REENADINNA YEW WOOD, WHICH WERE CHECKED FOR CENTIPEDES AND MILLIPEDES**

### **Microsite A: Under stones**

**Centipedes:** *Geophilus electricus* (L) (1 specimen), *Necrophloeophagus flavus* (De Geer), *Lithobius variegatus* Leach, *Lithobius forficatus* (L), *Lithobius microps* Meinert (1).

**Millipedes:** *Nanogona polydesmoides* (Leach), *Melogona scutellare* (Ribaut) (frequent), *Blaniulus guttulatus* (Fab), *Ophiulus pilosus* (Newport), *Brachydesmus superus* Latzel.

### **Microsite B: In yew leaf litter**

**Millipedes:** *N. polydesmoides*, *Cylindroiulus punctatus* (Leach), *B. superus*.

### **Microsite C: In association with dead yew wood**

**Centipedes:** *Brachygeophilus truncorum* (Bergsoë & Meinert).

**Millipedes:** *N. polydesmoides*, *Proteroiulus fuscus* (Am Stein) (1), *B. superus*.

### **Microsite D: Under moss on well-rotted dead yews**

**Centipedes:** *N. flavus*, *B. truncorum*, *L. variegatus* (1), *Litobius borealis* Meinert (1).

**Millipedes:** *Glomeris marginata* (Villers) (1), *M. scutellare*, *C. punctatus*, *Polydesmus* sp. (1), *B. superus*.

### **Microsite E: In moss on living yew trees**

**Centipedes:** *L. borealis*.

**Millipedes:** *C. punctatus*, *B. superus*.

### **Microsite F: Under rubbish (= a well rotted newspaper)**

**Centipedes:** *L. forficatus*.

**Millipedes:** *C. punctatus*.

### **Microsite G: Under moss, and associated soil on boulders**

**Centipedes:** *B. truncorum*, *L. variegatus*, *L. borealis* (1).

**Millipedes:** *N. polydesmoides*, *M. scutellare*, *O. pilosus*, *B. superus*.

### **Microsite H: Under small pieces of bark on living yew trees**

No centipedes or millipedes collected.

TABLE 1

SUMMARY OF MICROSITES IN WHICH MYRIAPODS (CHILOPODA AND DIPLOPODA) WERE RECORDED AT REENADINNA YEW WOOD.

MICROSITE	A	B	C	D	E	F	G
<i>G. electricus</i>	*						
<i>N. flavus</i>	*			*			
<i>B. truncorum</i>			*	*			*
<i>L. variegatus</i>	*			*			*
<i>L. forficatus</i>	*					*	
<i>L. borealis</i>				*	*		*
<i>L. microps</i>	*						
<i>G. marginata</i>				*			
<i>N. polydesmoides</i>	*	*	*				*
<i>M. scutellare</i>	*			*			*
<i>P. fuscus</i>			*				
<i>B. guttulatus</i>	*						
<i>C. punctatus</i>		*		*	*	*	
<i>O. pilosus</i>	*						*
<i>Polydesmus</i> sp.				*			
<i>B. superus</i>	*	*	*	*	*		*

## DISCUSSION

The most notable finding during this brief survey was that both centipedes and millipedes were very scarce in the yew wood at the time of collection. The only species which occurred as more than occasional individuals were *B. truncorum*, *M. scutellare* and *B. superus*. Of these *M. scutellare* was probably the commonest millipede in the woodland. All of the lithobiomorph centipedes were markedly scarce, as were the geophilomorphs with the exception of *B. truncorum*. Numerous, mostly small pieces of dead yew wood were examined, with very little result. The shallow yew leaf litter was virtually devoid of myriapods. The thin layer of dark soil, which had accumulated beneath moss on boulders in the woodland, also supported very few myriapods. Normally common species, including *P. fuscus*, *O. pilosus* and *C. punctatus* were distinctly scarce, and usually met with as single individuals.

It should be borne in mind that my field work was confined to two short visits during the winter months. In all likelihood visits at different times of the year, or the use of techniques other than hand sorting would reveal the presence of additional species.

## REFERENCES

Carruthers, T. D. & Gosler, A. G. (1995) The breeding bird community of Muckcross yew wood, Killarney. *Ir. Birds* 5: 308-318.

Kelly, D. L. (1981) The native forest vegetation of Killarney, south-west Ireland: An ecological account. *J. Ecol.* 69: 437-472.

Rodwell, J. S. (ed.) (1991) *British plant communities*. Volume 1. *Woodlands and scrub*. Cambridge University Press, Cambridge.

Smal, C. M. & Fairley, J. S. (1982) The dynamics and regulation of small rodent populations in the woodland ecosystems of Killarney, Ireland. *J. Zool. Lond.* 196: 1-30.

## **THE PREPARATION OF CENTIPEDES FOR MICROSCOPICAL EXAMINATION WITH PARTICULAR REFERENCE TO THE GEOPHILOMORPHA**

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### **INTRODUCTION**

Traditional methods of clearing and mounting geophilomorph centipedes have proved to be unsatisfactory. Both 60 per cent lactic acid and lactophenol, which are often used for temporary mounts, do not clear specimens adequately and cause slight swelling of the appendages, altering their shape. In addition, lactophenol contains glycerol which is hygroscopic and therefore takes up some water from the air, which is an additional disadvantage. Many workers, for example Attems and Verhoeff, made permanent mounts, macerating specimens by heating them in 10 per cent potassium hydroxide, washing, then dehydrating in a series of alcohols. They were cleared in xylene and mounted in Canada balsam. Potassium hydroxide, however, damages poorly sclerotized structures as well as the internal organs which are important for classification (for example the structure of the coxal organs) and also for assessing the maturity of the specimen (presence of spermatozoa in the seminiferous tubules of males and spermathecae of females). In addition specimens treated with potassium hydroxide become deformed under the pressure of the cover glass when mounted.

Other mountants which also act as clearing agents have been used such as polyvinyl lactophenol, which shrinks after some time, and Hoyer's mountant which may cause the specimen to swell and split, may crystallise and does not always ring satisfactorily.

Until recently (Pereira and Hoffman, 1993) I have used vegetable creosote (refined from beech tar) for temporary mounts. This is very satisfactory as it clears and dehydrates the specimens very well and does not alter the shape of the body and appendages (they are neither collapsed, nor inflated) and they remain pliable. Nevertheless, the smell presents a problem and if the specimens are kept in the creosote for a long time they are irreversibly darkened. Currently, however, I use ethylene glycol (ethylene glycol monophenyl ether = phenoxetol). Propylenephenoxetol (=3-phenoxypropanol) is similar and also functions well. Ethylene glycol has previously been used as a preservative for arthropods in pitfall traps by Szekelyhidly & Loksa, (1979) and Geoffroy & Celerier (1996). The great advantage of the ethylene glycol as opposed to creosote is that it has not have a strong unpleasant smell and in addition the specimens can remain in it without undergoing any alteration.

## **RECOMMENDED PROCEDURES**

### **Dissection**

As the anatomy of the mouth-parts, including the mandibles, is important in the taxonomy of the Geophilomorpha, it is often necessary to dissect these off. Specimens are dissected in ethanol not in creosote or ethylene glycol. The procedure is as follows:

1. Detach the head from the body. Dissection is carried out with a very fine entomological pin (a second pin bent at an angle of about 90 degrees is used to maintain body in an appropriate position). The pin can be mounted in an old biro by melting the end of the latter with a Bunsen and then introducing the head of the pin and holding it in place until the plastic solidifies.
2. Detach the maxillae on one side of the head capsule at the level of the membrane between the pleura of the head capsule and the coxosternum of the second maxillae.
3. Turn back the maxillae (i.e. turn through 180 degrees). This will expose their dorsal surfaces. They will still be attached to the head capsule by one side. Do not detach the mandibles, simply adjust them to provide the best position for their examination. In a temporary mount the preparation can be turned over to expose the dorsal side of the head capsule and the ventral surface of the maxillae.

If the dissection is done with care, the specimen is not damaged (this may be a time consuming process).

### **Temporary mounts**

Specimens are normally stored and dissected in 70-75 per cent ethanol. For temporary mounts they are removed to undiluted ethylene glycol which clears and dehydrates them in similar way to creosote. The dissected head clears in about half an hour or even a few minutes, the trunk takes longer, especially if robust.

A large cover glass is often required to examine the trunk and it may be necessary to cut the trunk into two or even three pieces if it is very long. Perforation of the pleura with a fine pin facilitates the entry of ethylene glycol and thus speeds the process of clearing. If large cover slips are used, there is a danger of spillage of the ethylene glycol onto the microscope stage. To avoid this, larger slides may be used. The simplest way to obtain these is to have them cut to order by a local glass merchant.

After examination the specimens are returned to ethanol, the head and mouth-parts are usually placed in a micro-vial.

### **Permanent mounts**

Permanent mounts are not normally made even for the very small specimens. It is much more convenient to store specimens in ethanol and make temporary mounts when needed because they can be observed in all positions (not only from ventral or dorsal sides). If however a permanent mount is required (for instance to avoid the loss of very small mouthparts accidentally detached from head during dissection) the specimen is removed from 70-75 per cent ethanol and placed in creosote (or in

ethylene glycol) in a Petri dish for a few hours and mounted on a slide in natural Canada balsam (obtainable from BDH, Laboratory Chemicals Division, Poole, Dorset, UK) diluted with a little creosote or ethylene glycol (NOT with xylene). The specimen is mounted on a large cover glass rather than a glass microscope slide and then covered with a small cover glass. This allows examination of the specimen from either side and at all magnifications. Such preparations are, however, very delicate and require protection both during storage and examination. This is provided by attaching them to a glass microscope slide with a band of paper glued to it by only one side. To examine from the other side remove the preparation, turn it over and slip back under the band of paper. A diamond pencil used for marking or engraving glass, metals and other hard materials is used to cut the small cover slip. For permanent mounts I prefer to clear the specimens with creosote because when mounted in Canada balsam the form of less sclerotized structures (such as the palps of the first maxillae) is better preserved than when cleared with ethylene glycol.

If the specimen has been in glycerine it should be washed in a Petri dish in 70-75 per cent ethanol for a few hours.

Temporary mounts may be made permanent by direct transfer from the creosote or ethylene glycol into Canada balsam.

#### **General remarks**

Specimens too large to mount on slides, for example some lithobiomorphs and scolopendromorphs, may be examined in Petri dishes containing ethylene glycol (or creosote) and held in place beneath a microscope slide. Perforation of the pleura facilitates clearing but this may take several days for large specimens.

The importance of accurate drawings cannot be over-emphasised. These are most easily and precisely obtained using a microscope with drawing tube. If this is not available then a squared eyepiece graticule may be used and the specimen drawn on squared paper.

#### **Techniques to remount specimens on slides**

Specimens on old slides and apparently in poor condition can be renovated by remounting.

1. Firstly the slide is soaked in water in a Petri dish to remove the original labels. Then if necessary, these are washed to clean them further, then dried and attached to a new slide. For specimens mounted in gelatine, place the slide vertically in a tube containing sufficient water to cover only the slide label.

2. Further treatment depends on the mountant that has been used.

- a) For Hoyer's mountant. The slide is soaked in water, possibly for several days, until the cover glass can be removed with ease. The parts of the specimen are transferred to a small container of 70-75 per cent ethanol for a day or so, then to creosote and then mounted on the new slide in natural Canada balsam diluted with a little creosote.

- b) For Canada balsam. Remove the slide from water, dry and transfer to creosote



until the cover glass and specimen parts can be easily removed. Then follow the procedure as in a).

c) For gelatine. Remove the slide from the water and dry it. Place in a Petri dish with glacial acetic acid until the cover glass and specimen parts can easily removed. Then follow the procedure as in a).

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## REFERENCES

Geoffroy, J.-J. & Célérier, M.-L. (1996) Cycles d'activité comparés de populations de Diplopodes édaphiques dans un écosystème forestier tempéré. In: Geoffroy, J.-J., Mauriès, J.-P. & Nguyen Duy-Jacquemin, M. (eds), *Acta Myriapodologica. Mém. Mus. natn. Hist. nat.*, **169**: 533-544.

Pereira, L. A. & Hoffman, R. L. (1993) The American species of *Escaryus*, a genus of Holarctic centipedes (Geophilomorpha: Schendylidae). *Jeffersoniana*, Number 3: 1-72.

Szekelyhidly, E. H. & Loksa, K. D. (1979). Oniscoiden- Diplopoden- und Chilopoden- Gemeinschaften im Untersuchungsgebiet "Sikfökt-Projekt" (Ungarn). *Opusc. Zool. Budapest*, **16**: 151-174.

## ADDITIONAL DATA ON SEGMENT NUMBER IN SOME BRITISH GEOPHILOMORPHA

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### INTRODUCTION

Arthur and Blackburn (1999) reported on the variation in segment number in *Brachygeophilus truncorum* (Bergsöe & Meinert) and *Geophilus insculptus* Attems populations from Northumberland and Durham noting that whereas different species may show different patterns, the same species may show different patterns in different places. Data on these species from other localities in England are presented here together with data for *Geophilus fucorum seurati* Brolemann which shows an unusual pattern of variation in segment number.

### RESULTS

#### *Brachygeophilus truncorum*

Table 1 presents data for 43 specimens collected from three localities in West Yorkshire in 1959, 1960 and 1961 and 30 specimens collected from 13 localities in West Somerset between 1983 and 1987 and 21 specimens from Slapton Wood in Devon collected on 8.iv.1960. Arthur and Blackburn's (1999) data for Northumberland and Durham are also shown.

TABLE 1

NUMBER OF LEG-BEARING SEGMENTS IN *BRACHYGEOPHILUS TRUNCORUM* FROM FOUR AREAS OF ENGLAND.

Site	Males				Females			
	35	37	39	41	35	37	39	41
Northumberland and Durham	1	26	0	0	0	2	45	0
West Yorkshire	0	11	1	0	0	1	29	1
West Somerset	1	7	4	0	0	0	16	2
Slapton, Devon	0	0	10	0	0	0	0	11

The data for Northumberland and Durham, West Yorkshire and West Somerset are similar, the most common segment number being 37 in males and 39 in females but in the Devon population it is higher being 39 in males and 41 in females.

### *Geophilus insculptus*

Table 2 shows the data for 35 *G. insculptus* collected from Woods in Shipley Glen, near Bradford, Yorkshire between 22 March 1960 and 24 January 1961. The data for *G. insculptus* given by Arthur and Blackburn (1999) for Northumberland and Durham are also shown. The figures for the two areas are very similar.

**TABLE 2**

### **NUMBER OF LEG-BEARING SEGMENTS IN *GEOPHILUS INSCULPTUS* FROM NORTHERN ENGLAND.**

Site	Males				Females			
	47	49	51	53	47	49	51	53
Shipley Glen, Yorkshire	2	9	0	0	0	2	20	2
Northumberland and Durham	5	15	1	0	0	0	23	1

### *Geophilus fucorum seurati*

Blower (1961) recorded *Geophilus fucorum seurati* from Llandudno, North Wales and the Isle of Man giving the number of leg-bearing segments as 51 to 53 in males and 55 in females. Eason (1964) gave figures of 51 to 53 for males and 51 to 57 for females. Lewis (1962) recorded the segment number of 14 specimens of the species from Kent, Sussex and Devon (Table 3) but failed to comment on the unusual nature of the data: the females having four more segments than the males i.e. 57 as opposed to 53. The usual difference in those geophilomorphs in which there is sexual dimorphism in segment number is two. Also there was no variation in leg number within the sexes. The sample was, however, very small.

Recently it has been possible to examine 11 specimens from, Ireland (frequent under stones on estuarine sandy mud, Dungarvan Harbour 16.8.1998, coll and det by Martin Crawley) which were sent to me by Tony Barber and 16 specimens which Tony Barber collected in Devon. Their segment numbers are recorded in Table 3.

In the specimens from Ireland and the southwest of England the commonest segment number is 53 in males and 57 in females although two males have 55 segments, three females 55 and one 59.

## **DISCUSSION**

Arthur and Blackburn (1999) discussed the possible causes of the variation in leg number between geophilomorph populations and pointed out that a concerted experimental approach was required to explain the cause of these differences. Further, Kettle and Arthur (in press) show that there is a latitudinal cline in segment

number in *Strigamia maritima* (Leach) between Shingle Street, Suffolk (Southeast England), and John O'Groats (Northeast Scotland), the populations showing fewer segments with increasing distance north. They suggest that this cline is caused by climatic selection, climatically-based phenotypic plasticity, or a mixture of the two. The higher numbers of segments in the Devon population of *Brachygeophilus truncorum* here reported may be a further example of such a cline. Further sampling will show whether this is so or whether it is a characteristic of this local population.

Larger samples of populations of *G. fucorum seurati* would provide further data on the fact that female *G. fucorum seurati* generally have four rather than two more segments than males. They would also show whether or not there are local population differences as may be suggested by the collection of a male with 55 and a female with 59 leg-bearing segments from Thurlstone Sands, Devon.

**TABLE 3**

**NUMBER OF LEG-BEARING SEGMENTS IN *GEOPHILUS FUCORUM SEURATI* FROM SOUTH AND SOUTH-WEST ENGLAND AND IRELAND.**

Site	Males				Females			
	53	55	57	59	53	55	57	59
Whitstable, Kent	0	0	0	0	0	0	1	0
Cuckmere, Sussex	4	0	0	0	0	0	1	0
Plymouth, Devon	1	0	0	0	0	0	7	0
Thurlstone Sands, Devon	0	1	0	0	0	0	0	1
Plym estuary, Devon	3	0	0	0	0	0	0	0
Warleigh shop, Devon	0	0	0	0	0	0	0	0
Stoke Gabriel, Devon	1	0	0	0	0	0	0	0
Stoke beach nr Noss Mayo, Dvn	0	1	0	0	0	0	0	0
Kingsbridge, Devon	0	0	0	0	0	0	1	0
Frogmore Creek, Devon	0	0	0	0	0	0	1	0
Brixham, Devon	1	0	0	0	0	0	0	0
Cofflete Creek, Devon	0	0	0	0	0	1	0	0
Antony shore, Cornwall	2	0	0	0	0	0	2	0
Dungarvan, Ireland	4	0	0	0	0	2	5	0

**ACKNOWLEDGEMENTS**

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## REFERENCES

- Arthur, W. & Blackburn, J. (1999) Limited variation in segment number in populations of *Brachygeophilus truncorum* and *Geophilus insculptus* in Northumberland and Durham. *Bulletin of the British Myriapod Group* **15**: 9-13.
- Blower, J. G. (1961) On some new and little known British centipedes. *Ann. Mag. nat. Hist.* (13) **4**: 183-187.
- Eason, E. H. (1964) *Centipedes of the British Isles*. London: Warne.
- Kettle, C. and Arthur, W. (in press) Latitudinal cline in segment number in an arthropod species. *Proc. Roy. Soc. Lond. B*.
- Lewis, J. G. E. (1962) The ecology, distribution and taxonomy of the centipedes found on the shore in the Plymouth area. *J. mar. biol. Ass. U.K.* **42**: 655-664.

## THE BRITISH SPECIES OF *CRYPTOPS*

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### INTRODUCTION

There are only three British species in the order Scolopendromorpha which includes the so called "giant centipedes" of warmer latitudes. All are in the genus *Cryptops* and are light reddish brown in colour; up to 35mm or more long and totally lacking ocelli. The coxosternite of the poison claws lacks teeth but instead bears several setae.

The head of *Cryptops* is circular to oval with at least a trace of a pair of dorsal paramedian sutures running from the bases of the antennae (near the outer edge) to the central part of the posterior margin. The antennae are usually composed of about 17 articles, sometimes less, occasionally more. The labrum is a well defined structure with large, well defined side-pieces and a narrow mid-piece. In *Cryptops parisi* the side-pieces are notched so that there appears to be five teeth in the centre of the labrum including the mid-piece.

There is no separate forcipular tergite, that being fused with the first trunk tergite and usually referred to as T1. This tergite has a conspicuous series of sutures on it in *C. anomalans*, forming a diagonal cross shape (cruciform suture) and is best seen on a dry specimen with the light at an angle. The forcipular coxosternite is about twice as broad as long, narrowed posteriorly and with more or less protuberant anterior borders between the poison claws with several stout setae. The poison claw has a smooth concavity and an inconspicuous basal node.

There are 21 trunk segments, each bearing a pair of legs gradually increasing in size to the 20<sup>th</sup>. The tergites show an alternation of small and large in the anterior region but this is far less marked than in *Lithobius*. The last trunk segments bear legs markedly larger than the others and there is a tendency for these to be shed. Since these legs are very valuable in diagnosis of species they should be kept with the specimen if at all possible; they are one of the most reliable ways of separating our species.

On the last pair of legs the coxal pores are small and very numerous and confined to a well-defined ventral area, the cribriform area. The distribution of spines and setae in relation to this may be important. The remainder of the leg comprises five articles (there is no trochanter); the ventral margins of the tibia and tarsus bear serrate combs which, when the leg is flexed, are opposed to one another to grasp prey. The characteristics of these combs are valuable in separating the three species. Unfortunately these legs have a tendency to flex up when animals are preserved; it may be helpful to straighten these out once the animals are killed before they become fixed in position to make future examination easier.

The terminal segments are poorly chitinised and the sexual structures are of limited value in identification. Illustrations of our species are found in Eason (1964).

## DESCRIPTIONS OF SPECIES

### *Cryptops anomalans* Newport 1844

- Maximum length : Up to 50mm, a large and impressive animal.
- Head : Longitudinal sutures complete, extending back from bases of antennae to posterior border of head.
- Labrum : Side pieces not notched at medial angles.
- Forcipular coxosternite : Anterior border Slightly protuberant, two prominent short setae on each side.
- Tergite 1 : With a distinct cruciform suture, often enclosing a small area at its centre in the centre of the tergite and extending almost to the posterior border. This is usually seen best with the light at a slight angle and the specimen fairly dry.  
A faint incomplete posterior transverse suture may be visible.
- Last legs : Cribriform area extends almost to the posterior border of the coxa, several smaller coxal setae among the pores.  
Prefemur usually without a distinct ventral groove.  
Tibial comb with 7 - 10 well spaced teeth.  
Tarsal comb with 3 -5 teeth borne on a slight eminence.

**Diagnostic features :** *C. anomalans* is distinguished by the characteristic tergite 1 suture as well as those on the head and the shape of the forcipular coxosternite border. On the last legs, the coxae and the tibial and tarsal combs. It is frequently of a large size.

**Distribution :** An animal mostly of synanthropic sites in the south east and the west (including South Wales). It appears to be very widespread in suburban gardens and similar sites in the Greater London area. Not yet recorded from Ireland or from the Channel Islands.

### *Cryptops hortensis* Donovan 1810

- Maximum length : 30mm, often much smaller.
- Head : Longitudinal sutures very incomplete, extending a short way back from the base of the antennae, absent posteriorly.

- Labrum : Side pieces not notched at medial angles.
- Forcipular coxosternite : Anterior border barely protuberant, about 4 setae on each side
- Tergite 1 : Without distinct sutures although an incomplete posterior transverse suture may be visible.
- Last legs : Cribriiform area does not extend to posterior border of coxa; only one coxal seta among the pores.  
 Prefemur with distinct ventral groove  
 Tibial comb with 5 - 8 separate teeth  
 Tarsal comb with 2 - 4 separate teeth.

**Diagnostic features :** Tibial and tarsal combs of last legs are best, also the coxae of the last legs, labrum (difficult to see without clearing or dissection), anterior border of forcipular coxosternite. *C.anomalans* is distinguished by T1 sutures, *C.parisi* may be more difficult.

**Distribution :** The commonest species of the genus in Britain, common in synanthropic sites, especially in the south but recorded from a wide variety of habitats there also including woodland. Essentially synanthropic in more northerly localities up to southern Scotland. Ireland. Channel Islands

### ***Cryptops parisi* Brolemann 1920**

- Maximum length : 30mm or more, much larger than *C. hortensis* typically but not as large as the largest *C. anomalans*.
- Head : Longitudinal sutures incomplete, extending a short way back from the bases of the antennae and a short way forward posteriorly.
- Labrum : Side pieces notched at medial angles so that there appears to be five teeth in the centre of the labrum including the mid-piece.
- Forcipular coxosternite : Anterior border narrower and more protuberant than in the other species, about 4 setae on each side, rather stouter than in *C. hortensis*.
- Tergite 1 : Similar to *C. hortensis*.
- Last legs : Cribriiform area extends almost to the posterior border of the coxa; several coxal setae among the pores.  
 Prefemur without a marked ventral groove  
 Tibial comb with 7 - 10 closely set teeth  
 Tarsal comb with 4-6 closely overlapping or even fused teeth.



**Diagnostic features :** Tibial and tarsal combs of last legs are best, coxae of last legs, labrum (difficult to see without clearing or dissection), anterior border of forcipular coxosternite. Distinguished from *C. anomalans* by tergite 1 sutures, immatures with fewer tibial and tarsal teeth can sometimes be quite difficult to distinguish from *C. hortensis*.

**Distribution :** An animal of synanthropic sites, mostly in the south but it has been recorded from woodland in the south west. Recorded as far north as Edinburgh and found in southern Ireland.

## DICHOTOMOUS KEY TO THE BRITISH SPECIES OF *CRYPTOPS*

1. T1 with a conspicuous cruciform structure and head with complete longitudinal sutures. Tibial comb with 7- 10 well spaced teeth and tarsal comb with 3 - 5 teeth on a slight eminence. Animal up to 40 mm long.....*Cryptops anomalans*
- T1 without a cruciform suture, sutures on head (if visible) incomplete.....2
2. Paired longitudinal sutures at posterior margin of head. Tibial comb with 7 - 10 closely set teeth and tarsal comb with 4 - 6 teeth closely overlapping or fused together. Anterior border of forcipular coxosternite relatively narrow and protuberant. Prefemur without a distinct ventral groove. Often quite large animals.....*Cryptops parisi*
- No such sutures at anterior margin, only anterior ones. Tibial comb with 5 - 8 and tarsal comb with 2 - 4 distinctly separate teeth. Prefemur with a distinct ventral groove.....*Cryptops hortensis*

## OTHER EUROPEAN SPECIES

### *Cryptops savignyi* Leach 1817

The species keyed out as this in Demange (1981) is clearly that known to British workers as *Cryptops anomalans* Newport, which Brolemann (1930) treats as a junior synonym of *C. Savignyi*. Brade-Birks (1934) notes Brolemann's treatment of *C. anomalans* as a synonym of *C. savignyi* and Matic (1972) describes the species as *C. anomalans* including Brolemann's *C. savignyi*. Attems (1930) regards *C. Savignyi* as a synonym of *C. hortensis* a view with which Brade-Birks and Matic concur. Demange (1947) distinguished *C. anomalans* and *C. savignyi* the separation being based on antennal characters, one ring of setae at the bases of the 10<sup>th</sup> article for the former compared with two for *C. savignyi* and *C. savignyi hirtitarsus*. Serra (1985) considers the three forms as being one species.

### *Cryptops trisulcatus* (Brolemann 1902)

This species, which can be up to 35mm has tibial combs of 9-13 teeth and tarsal combs of 4-5. The sutures on the head are discontinuous and the sutures on tergite 1 are parallel or converging, never forming a cross. There is a drawing of this in Demange (1981). It is recorded from the Pyrénées Orientales and Alpes Maritimes in southern France, Italy, Corsica, Roumania, Spain, Portugal, North Africa, Canary Islands.

### *Cryptops punctatus* C.Koch 1847

This species, recorded from Czechoslovakia by Folkmanova (1928) is synonymous with *C. anomalans*.

Other species recorded from southern areas of Europe include: *Cryptops croaticus* with similar sutures to *C. anomalans* as described by Matic (1972) and with a distribution encompassing central and south-west Europe; *Cryptops runceri* Croatia, Austrian Tyrol, Slovenia (Matic, 1979); *Cryptops illyricus* Slovenia (Kos, 1990); *Cryptops umbricus* Croatia (Kos, 1990) and *Cryptops hispanus* Spain (Garcia-Ruiz 1992).

Foddai *et al* (1995) note *C. anomalans*, *C. croaticus*, *C. garganensis*, *C. hortensis*, *C. illyricus*, *C. lobatus*, *C. parisi*, *C. punicus*, *C. trisulcatus* and *C. trisulcatus* from Italy. There are further species from Greece, etc.

## REFERENCES

- Brade-Birks, S.G. (1934) Notes on Myriapoda XXXV; Nomenclatural sources. *J. S-E Agric. Coll. Wye* **34**:197-209.
- Brolemann, H.W. (1930) *Éléments d'une faune des Myriapodes de France, Chilopodes*. Faune Fr. **25**.
- Demange, J-M. (1947) Étude sur quelques *Cryptops* (Myriapodes-Chilopodes). *Bull. Mus. N. Hist. nat.* (2e série) **19**:173-176.
- Demange, J-M. (1981) *Les Mille-pattes*. Paris; Éditions Boubée.
- Eason, E.H (1964) *Centipedes of the British Isles*. London: Warne.
- Foddai, D, Minelli, Scheller, U, Zapparoli M (1995) *Checklist della Specie della fauna Italiana 32 : Chilopoda, Diplopoda, Pauropoda, Symphyla*. Bologna: Edizioni Calderina.
- Folkmanova, B.(1928) *Chilopoda Republiky Ceskoslovenské*. Praze; České Akademie.

Garcia-Ruiz (1995) Estudio comparativo de cuatro comunidades de quilópodos (Myriapoda, Chilopoda) en Castilla-La Mancha. *Avances en Entomología Ibérica* 1995: 101-106.

Kos, I. (1992) A review of the taxonomy, geographical distribution and ecology of the centipedes of Yugoslavia. *Ber. nat.-med. Verein Innsbruck Suppl.* 10: 353-360

Matic, Z. (1972) *Fauna republicii Socialiste Roumânia, Clasa Chilopoda Subclasa Epimorpha*. Bucarest; Acad. Rep. Soc. Rom.

Matic, Z. (1979) Nouveautés sur la faune des Chilopodes de Yougoslavie. *Biol. vest. (Ljubljana)* 27:147-155.

Serra, A. (1985) Contribución al conocimiento de los Scolopendromorpha (Chilopoda) del sur de la península Ibérica. *P. Dep. Zool. Barcelona* 11:37-43.

## MILLIPED OR MILLIPEDE ?

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A transatlantic dichotomy resulting in the two spellings “millipede” versus “milliped” has perplexed students of these animals (as well as innumerable editors and proof readers of scientific journals) for many years. The first usage, of course, enjoys a long historical priority in the British Isles and is the preferred form listed in most, even North American dictionaries. Since I essentially “grew up” with the second, now firmly ensconced in American literature, I accepted it as correct. Whilst occasionally wondering about the origin of the Nearctic mutation, I never actually looked into the matter until quite recently, to the extent possible resources at hand.

While chiefly concerned here with the debut of “milliped”, I did notice whilst browsing old literature that the original French vernacular term was *millepiéd* and *millepiéds* (Gervais, 1847: 34) so the current “*millepattes*” must have had a more recent origin. In any event it is the word listed in my copy of “Mansion’s Shorter French and English Dictionary (D.C.Heath, 1940). I leave exploration of this subject to our French colleagues.

Early American (by which I mean citizens of the United States) savants apparently never referred to Diplopoda with any kind of “common name”. I have scanned the publications of Thomas Say, H.C.Wood, C.H.Bollman and O.F.Cook without seeing the word “millipede” OR “milliped” ever used during the 19<sup>th</sup> Century. The nearest concession to vernacular was always “diplopod”, even in non-scientific papers; this resort to indirect reference lasted throughout the 19<sup>th</sup> Century and well into the 20<sup>th</sup>.

The first usage of “milliped” that I can find in *any* publication is in a paper by Cook, that appeared in the volume 40 of the *Proceedings* of the U.S. National Museum, dated 10 April 1911. This watershed event was heralded in the title (“notes on the distribution of millipeds in southern Texas”) and the opening sentence (“The millipeds and other primitive types of humus inhabiting Arthropoda....”). Thereafter, in a few more papers by Cook, and all by his protégé, H.F. Loomis, the e-less spelling became permanent.

R.V.Chamberlin, who began writing about these animals in 1903, studiously avoided using any vernacular term for years, sticking with “diplopods” on the rare occasions that he referred to them at all in a general way. In 1918, two of his papers did use “millipede” in the title. For Chamberlin, the break-away came in 1922, with “The millipeds of Central America”, coincidentally also appearing in the *Proceedings* of the U.S.National Museum. From that date onwards, the conversion to “milliped” was complete although he did continue to use “diplopod” on occasion, usually in the title of several papers.

I have no insights whatever regarding Cook's first omission of the terminal "e". Nor did Mr. Loomis, when I asked him about it in 1951. However, one possible explanation is that the initiative came not from Cook, but an anonymous U.S. Federal editor, either at the museum or the Government Printing Office. This at least would be consistent with Chamberlin's first use, in the same serial.

It would be of interest to follow back the derivation of "millipede" itself. My dictionary (Funk & Wagnall's Standard College Dictionary, 1963), used that spelling, saying that it derives from the Latin *pes, pedis*. The form cited by Gervais shows that the French did not use a terminal "e" on millepied in the early 19<sup>th</sup> Century, so its presence may be an Anglican innovation unless it became extinct in France following the Norman invasion and survived only in the islands. Oddly, the same dictionary uses the spellings "centipede" and "millipede" as first choice but only "biped" and "cirriped" for those items, even though citing "*pes, pedis*" as the source for all four examples.

However, another usage may impose a still different complexion to the matter. Referring to what I consider the ultimate reference for the origin and usage of scientific names (R.W. Brown, *Composition of Scientific Words*, Smithsonian Institution Press, 1956, 1959), I find the entry "*millepeda*" given as the Latin word for what Brown then anglicised as "milliped" ! In light of Brown's recognised authority in etymology, I cannot help believing that "milleped" must actually be the correct spelling of the term, and "millipede" and "milliped" should *both* be discarded in its favour/favor.

In contrast, I learn from my Latin dictionary that although when used as a noun, with such meanings as "containing a hundred, related to a hundred", the Latin word is spelled with an "e", as in *centenarius, centesimus*, but when joined with another word as a modifier, the spelling changes to "i", as in *centimanus, centipeda*. So centiped adopts the "i", but Brown gives the spelling without the terminal "e".

As a concluding example of inconsistency, U.S. workers may spell the word without an "e" on the end, but pronounce it "millipeed".

## **CENTIPEDES COLLECTED IN WEST CORNWALL AT EASTER 1998**

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### **INTRODUCTION**

At the BMG/BISG Field Meeting in Cornwall on 16<sup>th</sup>-19<sup>th</sup> April 1998 a total of 15 species of centipede were collected from a variety of sites, coastal, woodland, roadside, moorland, gardens, etc. These included *Arenophilus peregrinus*, described elsewhere (Gregory & Jones, 1999) and *Nesoporogaster brevior*. Several species which might have been expected such as *Strigamia maritima*, a very common maritime species, were not apparently found despite extensive searching. The list given here is based on records from W.Arthur, K.Alexander, S.Gregory, R.Jones, J.Lewis, P.Richards and the author. 10 km National Grid squares are given; all are in the 100 km square 10 (SW).

### **RESULTS**

#### **GEOPHILOMORPHA**

##### ***Haplophilus subterraneus* (Shaw)**

This is an extremely common and widespread animal in southwest England and is found in virtually every woodland searched, being the common large geophilomorph of the area.

10km squares: 42,43,53,54,62,63,64,72,73,83

##### ***Nesoporogaster brevior* Eason**

This was first recorded and described from a Cornish site (Carclew) as *Nesoporogaster souletina brevior* by Eason (1962) but had not been reported since. Specimens were found by R.E.Jones and the author at Devichoys Wood, a CWT nature reserve, in company with *Haplophilus subterraneus* and other species. The location is in within 2km of the original site. Eason (1962) suggested that this animal could well have been introduced to the Carclew estate with exotic plants; whatever its origin, the species is clearly well established in this small area of Cornwall.

10km square: 73

##### ***Hydroschendyla submarina* (Grube)**

A single male of this species was found amongst rocks at Pendennis Castle whilst searching for *Strigamia maritima*.

10km square: 83

***Schendyla nemorensis* (C.L.Koch)**

This common species was recorded from Tremayne Woods, Gunwalloe and Glendurgan Gardens (NT).

10km squares: 43, 62, 72, 73

***Brachyschendyla dentata* Brolemann & Ribaut**

This was collected by R.E.Jones at Crowan. It is a small and inconspicuous species but is probably very widespread in southern England in suitable sites (including churchyards).

10km square: 63

***Geophilus carpophagus* Leach**

Recorded from three localities; Gunwalloe, Lamorna and Sennen.

10km squares: 32, 42, 62

***Geophilus osquidatum* Brolemann**

An example of this species, widespread in the south-west, was collected at Devoran Quay. Another specimen, eventually identified as *G.osquidatum* was found at Praa Sands.

10km squares: 52, 73

***Brachygeophilus truncorum* (Bergsoë & Meinert)**

This common small woodland and heathland species was collected from twelve sites from a variety of habitats.

10km squares: 43, 52, 53, 54, 63, 64, 72, 73, 83

***Arenophilus peregrinus* Jones**

The first record of this species from mainland England was collected by S.J.Gregory at Lamorna Cove (Gregory & Jones, 1999).

10km square: 42

**SCOLOPENDROMORPHA**

***Cryptops hortensis* Donovan**

Recorded from a variety of sites, some woodland.

10km records: 42, 53, 62, 63, 64

**LITHOBIOMORPHA**

***Lithobius variegatus* Leach**

Recorded from woodland, gardens and other sites. A species widespread in non-urban areas in the Southwest.

10km squares: 43, 52, 53, 63, 72, 73

***Lithobius forficatus* (Linné)**

One of the two large brown *Lithobius* species in Cornwall, recorded from 11 sites.

10km squares : 32, 42, 43, 53, 54, 62, 63

***Lithobius melanops* Newport**

This species is typically associated with synanthropic sites and the seashore and is recorded from five sites here.

10km records: 42, 54, 62,

***Lithobius pilicornis* Newport**

A slightly larger and, seemingly, more aggressive species than *L. forficatus* with scattered records from urban and non-urban sites across SW Devon and Cornwall.

Here recorded from Devichoys Wood, Devoran Quay, Pendennis, Glendurgan, Gunwalloe and Chyvarloe.

10km records: 62, 72, 73, 83

***Lithobius microps* Meinert**

A small and common species often associated with human activity.

10km squares : 43, 54, 62, 63, 64, 73

## DISCUSSION

Chilopod records for Cornish sites have been collected over many years, including those of the late F.A. Turk so that the species list for the West Cornwall vice-county is extensive. Keay (1993) listed 28 excluding *Lithobius tenebrosus* whose status required confirmation.

Turk (1944) reviewed his then records from various parts of Cornwall and referred to an earlier paper by Larwood. Turk's paper included records of *Brachyschendyla monoeci* from a greenhouse, *Henia brevis* (as *Chaetechelyne montana oblongocribellata*) and *Clinopodes linearis*. In a later paper (Turk, 1945) he reported *Lithobius tenebrosus* (as *L. nigrifrons*). In Frank Turk's own notebooks, currently in the author's possession, he records also *Lithobius agilis* from a field near Reskadinnick. Of these, *Henia brevis* is now known to be widespread in synanthropic sites and had been recorded from east Cornwall (unpub.) and *Clinopodes linearis*, whilst commonest in synanthropic sites in the Greater London area has been recorded from Plymouth (Lewis, 1962).

The status of the two lithobiids is less clear and unfortunately the specimens are no longer available for examination. *Lithobius tenebrosus* was collected from a site in Wales in 1988 (Keay, 1989) having previously been reported from Northumberland-Durham by Bagnall, a record that has had doubt cast upon it. The fact that it was found as a single but definite record from Wales means that it might be similarly rare in Cornwall if it occurs. In the case of *Lithobius agilis*, there were old records from Ireland, which Eason (1965) thought might be due to specimens of *Lithobius tricuspis*. The latter has been found to be widespread in South Devon and there are single records from both Wales and the Isle of Wight. If the specimen were not, in fact, *L. agilis* might it have been *L. tricuspis*?



TABLE 1

## CHILOPOD SPECIES RECORDED FROM CORNWALL

Species	Turk (1944)	Rundle (1977)	Keay (1983)	Present List
<i>Haplophilus subterraneus</i>	x	x	x	x
<i>Nesoporogaster brevior</i>			x	x
<i>Hydroschendyla submarina</i>			x	x
<i>Schendyla nemorensis</i>	x	x	x	x
<i>Schendyla peyerimhoffi</i>			x	
<i>Brachyschendyla monoeci</i>	(x)		(x)	Glasshouse
<i>Brachyschendyla dentata</i>				x
<i>Henia brevis</i>	x		x	
<i>Strigamia acuminata</i>	x		x	
<i>Strigamia maritima</i>	x	x	x	
<i>Clinopodes linearis</i>	x		x	
<i>Geophilus carpophagus</i>	x		x	x
<i>Geophilus fucorum</i>			x	
<i>Geophilus osquidatum</i>			x	x
<i>Geophilus pusillifrater</i>			x	
<i>Necrophloeophagus flavus</i>	x	x	x	
<i>Brachygeophilus truncorum</i>	x	x	x	x
<i>Nothogeophilus turki</i>			x	
<i>Arenophilus peregrinus</i>				x
<i>Cryptops hortensis</i>	x	x	x	x
<i>Cryptops parisi</i>	x		x	
<i>Lithobius variegatus</i>	x	x	x	x
<i>Lithobius forficatus</i>	x	x	x	x
<i>Lithobius melanops</i>	x	x	x	x
<i>Lithobius borealis</i>	x	x	x	
<i>Lithobius agilis</i>	x			Turk notebooks
<i>Lithobius tenebrosus</i>	x			Turk, 1945
<i>Lithobius pilicornis</i>	x	x	x	x
<i>Lithobius calcaratus</i>		x	x	
<i>Lithobius crassipes</i>		x	x	Rundle (1977)
<i>Lithobius microps</i>	x	x	x	x

Rundle (1977) carried out a survey and reported 15 species from the Lizard area including *Lithobius borealis* (as *L. lapidicola*), *Lithobius calcaratus* and *Lithobius crassipes*. This latter is the only record of the species from either Devon or Cornwall despite the fact that in many parts of Britain it is the common small lithobiid. Unfortunately the specimens were not retained for further examination

One of the most interesting aspects of our knowledge of centipedes from west Cornwall is the number of species so far not recorded. *Henia vesuviana* is widespread along the south coast of England, *Strigamia crassipes*, *Geophilus insculptus*, *Geophilus electricus* and *Necrophloeophagus flavus* are widespread British species. Presumably further work in the area would discover these; indeed the field meeting failed to turn up a variety of types known to occur in the area such as the maritime species *Geophilus fucorum*, *Schendyla peyerimhoffi* and *Strigamia maritima*. Of the lithobiids, neither *Lithobius crassipes*, *Lithobius curtipes* or *Lithobius macilentus* are south western species. Presumably *Lamytes fulvicornis* may be found in the autumn in suitable sites. The largest of our *Cryptops* species, *Cryptops anomalous*, like *C. parisi* occurs in Plymouth and elsewhere and could well turn up in urban sites in west Cornwall.

## REFERENCES

- Eason, E.H. (1962) The chilopod genus *Nesoporogaster* Verhoeff. *Proc. zool. Soc. Lond.* **138**:123-132.
- Eason, E.H. (1985) On *Lithobius tricuspidis* Meinert (Chilopoda, Lithobiidae) in Britain. *Ann.Mag.nat.Hist.* (13) **8**: 285-292.
- Gregory, S.J. & Jones, R.E. (1999) *Arenophilus peregrinus* in Cornwall: a centipede new to mainland Britain. *Bull. Br. Myriapod Gp.* **15**: 28-29.
- Keay, A.N. (1989) *Lithobius tenebrosus* Meinert from Aberystwyth, Cardiganshire. *Bull.Br. Myriapod Gp.* **6**: 3- 5.
- Keay, A.N. (1993) Vice County Lists for Centipedes - September 1992. *Bull. Br. Myriapod Gp.* **9**: 35-42.
- Lewis, J.G.E. (1962) The ecology, distribution and taxonomy of the centipedes found on the shore in the Plymouth area. *J. mar. biol. Ass. U.K.* **42**: 655-664.
- Rundle, A.J. (1977) Nature Conservancy Council, Invertebrate Survey of the Lizard 12<sup>th</sup>-17<sup>th</sup> June 1977; Mollusca and other miscellaneous invertebrate groups (unpublished report).
- Turk, F.A. (1944) Myriapoda (Chilopoda and Diplopoda) from Cornwall with notes and descriptions of forms new to the British Fauna. *Ann. Mag. nat. Hist.* (11) **11**: 532-551.
- Turk, F.A. (1945) Myriapodological Notes I. *N. W. Naturalist* **1945**: 137-144.

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