DYFED INVERTEBRATE GROUP

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OPILIONES

HARVESTMEN IN SOUTH-WEST WALES - JHP SANKEY

The results of biological recording schemes, both at a national and local level, have done much to encourage the study of formerly little-worked groups. This includes the Opiliones - harvestmen or harvest-spiders - which are only remotely related to the true spiders and from which they are distinguished by having the body and head fused together in one piece, the second pair of legs longer than the rest, and the absence of silk glands; harvestmen also only have two eyes. The provisional atlas of harvestmen (Sankey 1988), as in other groups, to some extent reflects the distribution of recorders but it also points to a number of interesting ecological problems which amateur naturalists could materially assist to solve by more detailed recording. An insight into some of these problems may be found in the Linnean Society monograph on the group (Hillyard & Sankey 1989). One problem which has recently come to light concerns our rarest harvestman Sabacon viscayanum, so far only recorded from less than a dozen localities, all of them in South Wales. Martens (1983) ascribes this harvestman to the subspecies ramblaianum, which is only recorded elsewhere from the Pyrenees. So far as we know, the genus (the only one in the family) has comparitively few species, showing a markedly disjunct distribution in Europe and the Northern Hemisphere. The genus is probably a Tertiary relict, though the suggestion has been made that the proximity of some of the British sites to old industrial works might indicate that the species was originally imported. However, most of the Dyfed localities for Sabacon are old woodland sites in rural situations away from any industrial influence. Further searches noting the type of woodland (apparently its usual habitat) and other local features, such as abandoned quarries and other industrial features, might enable its present status in Wales to be more clearly understood. Sabacon is a distinctive harvestman and is easily recognised by its densely-spined and swollen palpal tarsus and tibia.

Another objective of biological recording is to obtain specimens from which the life-cycle can be deduced or from which specimens can be bred. We know little about Sabacon's life-cycle or, indeed, its ecology. Recent finds of immature specimens in March and April suggest that it may overwinter in an early instar, like the common harvestman Rilaena triangularis, and mature earlier in the season than most British species.

DYFED RECORDS OF Sabacon viscayanum

22/624167	Pistyll Quarry (VC44)	-/11/86	CM Merrett
22/596524	Allt-goed (VC46)	15/9/87	AP Fowles
22/804346	Afon Gwydderig (VC44)	22/3/88	AP Fowles
22/577497	Falcondale Wood (VC46)	9/8/88	KM Catley
22/591163	Carmel Woods (VC44)	29/3/89	IK Morgan

Dicranopalpus ramosus is another enigmatic species. First recorded in Britain from Bournemouth in 1957 (Sankey & Storey 1969), this species continues to extend its range and is now widely-known from southern England and Wales, particularly in coastal areas. The species has synanthropic associations and shows a preference for gardens, hedges, parks, etc.. and has also been taken in a street in the middle of Carmarthen. It seems that Dicranopalpus has been imported to this country, perhaps arriving as eggs in soil or as harvestmen on plants brought as horticultural produce from the western Mediterranean countries it inhabits as a native (Douglas Brown pers. comm.). It may well have been, and is being, distributed in Britain in the same way, perhaps transported with discarded garden rubbish. But why do current records indicate a mainly coastal distribution? Perhaps lack of search elsewhere is the reason as there are some large, unrecorded areas in South Wales and the central south-west of England. The extraordinary length of the apophysis of the palpal patella - reaching to more than half the length of the tibia - and the very long legs, often spread out at right angles to the body, makes this large species instantly recognisable.

As with other recording schemes, harvestmen have their own cards which are obtainable from the Environmental Information Centre (formerly the Biological Records Centre), Monks Wood Experimental Station, Abbots Ripton, Huntingdon, PE17 2LS. I am the national recorder for this group and completed cards may be sent to me at - 3 Glenrose, Mickleham, Dorking, Surrey, RH5 6BY. I am willing to help with identification difficulties; please ensure that specimens are well-preserved (Hillyard & Sankey loc. cit.), not too young, and are accompanied by the usual data requirements.

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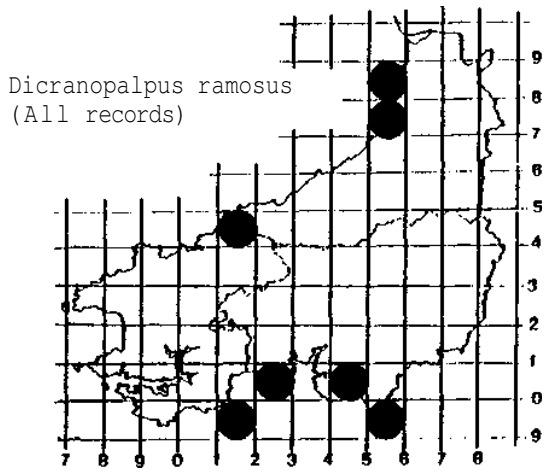

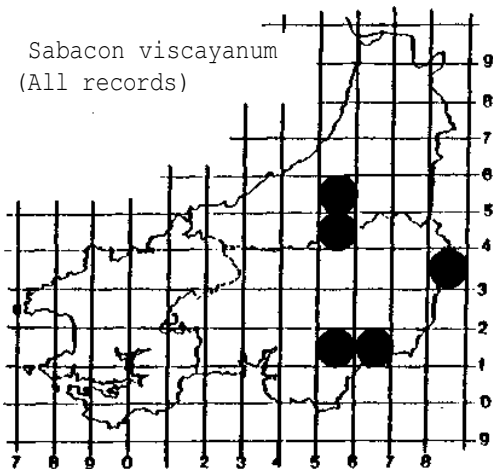

ODONATA

THE CLUB-TAILED DRAGONFLY Gomphus vulgatissimus IN WEST WALES - A COKER.

One of the aspects of recording Odonata in Dyfed has been to establish the presence and extent of distribution of Gomphus along the major river systems. The club-tailed dragonfly is a scarce inhabitant of slow-moving lowland rivers and is chiefly found along stretches of the Thames, the Wye, the Severn, and a few smaller rivers in Sussex. It had been recorded in Dyfed as long ago as 1903 by TW Barker who stated that he "saw three or four specimens of this local species near Oaklands in June 1903 and caught one of them" (Barker 1905). Oaklands (22/424165) was Barker's home at Cwmffrwd in the Tywi valley, south of Carmarthen. Another Carmarthenshire naturalist, John Brunker, mentions that there had been "one specimen of this rare dragonfly recorded "in Llanegwad parish (22/51-21-) higher up the Tywi (Brunker c.1950). He later wrote (Brunker 1961) - "although this is considered to be a very local insect, specimens have from time to time been seen in the county". The only other record of the species in Dyfed is that of a single larva collected during a survey of freshwater invertebrates on the Tywi at Dryslwyn Castle (22/552201) in either July or August 1949 (Jones 1951).

With this background it was obvious that any present-day search for Gomphus in Dyfed should be concentrated along the lower Tywi and, during the 1984 season, the river south of Carmarthen was surveyed in the hope of re-finding the species. However, at this point the river is still fairly estuarine and did not seem to be particularly suitable so some effort was made on the larger tributaries in the area, without success. In 1985, the search was extended upstream of Carmarthen and, on the evening of 19 May, a few larval exuviae and a single adult which had failed to emerge successfully were found. Subsequent visits to the river between Carmarthen (22/43-20-) and Llandeilo (22/62-21-) resulted in records of exuviae from four 10-km squares and eighteen 1-km squares, but flying adults were only seen once (Coker & Fox 1985).

Visits to the Gwendraeth Fach, the Loughor, and several sites on the Afon Teifi between Lampeter and Llechryd during the 1985 season proved unsuccessful and during the next three years searches were made on the Afon Taf, Western Cleddau, Eastern Cleddau and Afon Nyfer to look for adults or exuviae at the appropriate time of year, similarly without success. However, on 13 May 1989 I found a dead larva on the Pembrokeshire bank of the Afon Teifi in the gorge just above Cilgerran Castle (22/197429). The insect had left the river and crawled up the bank but had not, for some unknown reason, been able to complete its emergence. No other specimens were discovered at this site despite further searching. I wondered whether the main period of emergence had commenced and so, two days later, I visited a known site on the Tywi. Here I found six exuviae and, therefore, it seemed clear that emergence had begun.

The Teifi gorge has a public footpath running along its southern (Pembrokeshire) bank but both sides of the river are heavily-wooded and receive little direct sunlight. However, there are a few open grassy areas near the river and it was on one of these, which has been formed into a car-park, that the first specimen was discovered. Unfortunately, much of the southern bank has been quarried for stone and so most of the banks are rocky. The northern (Ceredigion) bank is much more suitable as the banks are composed of sands and silts as well as rock and are more often in sunlight. The silty banks support stands of reed canary-grass Phalaris arundinacea, a plant which is often favoured by Gomphus during emergence. Access to the Ceredigion bank is difficult so a canoe expedition was organised on the river on 20 May, manned by my husband, Stephen, and Stephen Evans. A small grassy promontory just upstream in the next 10-km square (22/200428) seemed to be a likely place to look and here a single exuvia was found. There was no sign of exuviae anywhere along the banks where the woods come directly down to the riverside. Meanwhile, I again surveyed the car-park at Cilgerran, this time finding one exuvia and an adult female in the process of emergence. After about an hour this individual flew off into the nearby trees. A walk along the Pembs. side of the river from Cilgerran Castle to Llechryd Bridge (22/217436) proved that the river was very slow-flowing with large pool areas. The northern bank appeared to have many suitable emergence

sites, although the southern bank, being shaded and rocky, seemed less suitable and no exuviae were found.

Having established the occurrence of Gomphus vulgatissimus on the Afon Teifi, further surveys are necessary to determine the full extent of its distribution along the river. The Teifi has an unusual gradient with many slow-flowing sections occurring as far upriver as Cors Caron. Some of these stretches are gravel-bottomed and perhaps unsuitable but it will be interesting to discover the full range of the distribution of Gomphus on the Teifi.

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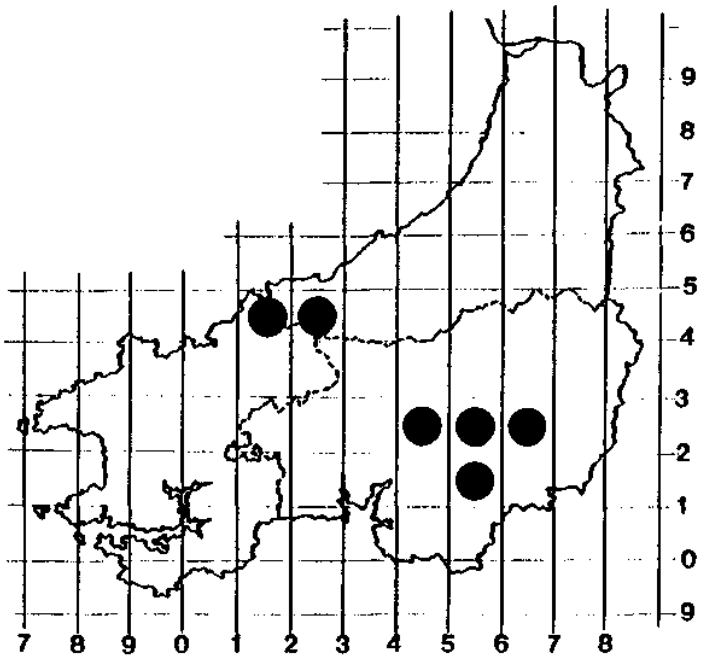


Fig. 1. Modern (post-1984) records of Gomphus vulgatissimus in Dyfed.

PSEUDOSCORPIONES

FALSE-SCORPIONS IN CEREDIGION, VC 46 - A O CHATER.

Introduction;
Pseudoscorpions are an Order of arachnids with twenty-five species in Britain, ten of which have so far been recorded in Ceredigion. All the British species are less than 5mm long and all have prominent pincers (pedipalps) that make them look superficially like minute, tailless scorpions. Although widespread, and abundant in some habitats, they are unobtrusive animals and unfamiliar to many naturalists. Once one becomes aware of them, though, they prove to be singularly endearing creatures and possessed of more character than most other small invertebrates.

Pseudoscorpions are carnivores, preying on such animals as springtails, booklice and mites. Some species have the very unusual ability to run backwards more quickly than forwards, doing so when alarmed. The forward gait of most species is rather stately, with pedipalps held aloft and open. When hiding or at rest, with their pedipalps and legs drawn in, they usually have a curiously un-animal like rectangular outline and are easily overlooked. Pseudoscorpions construct silken chambers for breeding, moulting and probably also for hibernation. Courtship dances and complex mating procedures have been described for many species. Of ecological significance is the presence in some species of spermathecae in which the female can store sperm for long periods, enabling small, temporary habitats to be effectively colonised by a single female. Related to this is the practice of phoresy found in a number of the species; this is a dispersal mechanism whereby the pseudoscorpions hitch rides on the legs of flies, beetles, harvestmen, etc., holding on usually by their pedipalps and thereby reaching rotten trees, animal or bird nests, compost heaps and other isolated, short-lived habitats they would otherwise be unlikely to have a chance to colonise. Those species whose life-cycles have been studied produce one or two generations a year and live for about 2-5 years. All species have four instars (protonymphs, deutonymphs, tritonymphs and adults) and once adult they do not moult again.

Pseudoscorpions occur in a great variety of habitats and most species have rather precise ecological requirements. Very broadly speaking, the species can be divided into two groups. Those belonging to the Chthoniidae and Neobisiideae, which have the abdomen lacking a median dorsal longitudinal line dividing the tergites in two (represented in Ceredigion by the genera Chthonius, Neobisium, Roncus and Roncocreagris) occupy permanent and continuous habitats (Rundle 1986) such as leaf-litter in woods, moss and grass-tussocks in marshes and pastures, etc. Those belonging to the remaining families Cheiridiidae, Chernetidae and Cheliferidae, which have the abdomen with a conspicuous pale median dorsal longitudinal line dividing the tergites (represented in Ceredigion by the genera Cheiridium, Lamprochernes, Pselaphochernes, Allochernes and Dinocheirus) occupy temporary and highly discontinuous habitats such as nests, rotting trees, haystacks, barns and manure heaps. It is especially in the latter group that spermathecae occur and phoresy is practiced. It should perhaps be borne in mind, though, that haybarns in old farms may presumably provide an unvarying habitat for many centuries and mature oaks can go on producing deadwood microsites for an equal length of time, and such sites may well be longer-lived and more stable than many of our ill-used woodland and wetland sites.

The standard and essential work on British pseudoscorpions is Legg & Jones (1988), a generously illustrated monograph complete with 10-km distribution maps and a great deal of information on ecology and life-history. The maps supersede those in the BRC provisional atlas (PE Jones 1980a) and the recording scheme is being actively continued by Gerald Legg (The Booth Museum of Natural History, Dyke Road, Brighton , Sussex, BN1 5AA). The somewhat complex key in Legg & Jones can be worked by the beginner most effectively by selecting the more easily seen characters from amongst the often-numerous and microscopic characters at each dichotomy, and by reference to the exceptionally helpful illustrations. (A provisional, much simpler, illustrated key, using x20 lens characters, by Adrian Rundle (1986) has been circulated privately and it is hoped that this will be published

soon). A number of papers on the pseudoscorpions of individual counties have recently been published, including Yorkshire (Howes 1971), Northamptonshire (PE Jones 1979), Bedfordshire (Rundle 1979), Hertfordshire (Judson 1979, 1987), Suffolk (Mendel 1981), Huntingdonshire (PE Jones 1980b) and Norfolk (RE Jones 1985). Apart from a few records in this Newsletter (Fowles 1989) Ceredigion has, along with the other Dyfed vice-counties, made few appearances in recent pseudoscorpion literature. Miles (1984) recorded a single individual of Cheiridium museorum from the mature dunes at Ynys-las (22/607937), away from any normal habitat for the species and possibly a phoretic stray. The six Ceredigion dots for pseudoscorpions in the provisional BRC atlas (PE Jones 1980a) do not alter the general picture given below.

The present survey is based on records made from 1984 to 1989, and the accompanying maps show the 10-km square distributions of the ten Ceredigion species for this period. Most of these records were collected casually as part of general invertebrate recording and voucher specimens have been retained in most cases. However, a few habitats, notably deadwood on standing trees, flushes on sea-cliffs, intertidal rock crevices and farm buildings (see below) were specifically searched for pseudoscorpions. None of the species characteristic of deadwood and under the bark of old trees (such as Chernes cimicoides) have been found in Ceredigion, in spite of energetic searching. A number of other habitats which regularly contain pseudoscorpions in other parts of Britain have, on the other hand, scarcely been looked at in Ceredigion. These include compost and manure heaps, old libraries, bird and mammal nests, pigeon lofts and grain stores.

Farm Buildings:
Forty-seven farm buildings containing hay or straw in 40 farms, distributed in 37 tetrads in 21 10-km squares, were sampled for pseudoscorpions between December 1988 and August 1989. Hay and straw and the debris from this on floors, windowsills, etc.. is most easily searched by sieving, and in most cases c.700 cc of sievings (material that has passed through a mesh with holes 2mm square and was held back on a mesh with holes 0.75mm square) was collected. This material was then sprinkled on a white tray and examined with a large magnifying glass - an adult Cheiridium is less than 1.5mm long and nymphs of all species, being paler as well as smaller than adults, can be difficult to pick out. Even when mixed up with debris and concealed, the slow and deliberate movements of pseudoscorpions makes them easy to distinguish amongst the usually more frantic movements of the other creatures present.

The buildings sampled comprised 23 Dutch barns, 9 stone cowsheds or stables, 7 stone haybarns, 5 haylofts of stone barns, 2 former pigsties and 1 concrete and breeze-block haybarn. Several of the Dutch barns were recently-constructed, with concrete floors. The farms were chosen to give a wide coverage of 10-km squares, for convenience of visiting and because of acquaintance with the farmers and may thus be considered to be a fairly random selection. Of the buildings sampled only 12 produced no pseudoscorpions, 14 produced one species, 14 produced two, 4 produced three, 2 produced four and 1 produced five species. Twenty-five of the buildings contained Dinocheirus panzeri, 13 contained Allochernes powelli, 13 contained Cheiridium museorum, 10 contained Chthonius ischnocheles, 4 contained Lamprochernes nodosus, 1 contained Pselaphochernes scorpioides and 1 contained Roncus lubricus. Allochernes was associated with Dinocheirus in eleven of its thirteen sites while Cheiridium was with Dinocheirus in only three of its thirteen sites and was on its own in eight. In general, Cheiridium seems to favour drier sites than the other species, especially lofts. Pseudoscorpions can occur in large concentrations in some of these buildings, c.270 Allochernes being found in the standard sample from a Dutch barn at Llanaeron (22/481602). Usually, the greatest numbers of most of the species was found in hay which was two or more years old and were especially concentrated in hay debris of uncertain but probably considerable age. Straw is generally less productive than hay and where no hay at all is present Cheiridium is often the only species to be found.

It seems impossible to predict which buildings will produce particular species, and indeed whether the buildings will contain pseudoscorpions at all. Dutch barns on concrete floors, and the concrete-floored, breeze-block modern barn, were no less rich than ancient stone barns with decades of debris on their earth or stone floors, and several long-established

and apparently suitable barns contained no pseudoscorpions. It may be that the distribution of these species is conditioned at least as much by accidents of dispersal as by the habitat conditions of the buildings. Dispersal is presumably largely by transport of hay and straw between farms as well as by phoresy.

Mites, money-spiders, springtails, booklice and beetles are usually the commonest invertebrate associates in the sievings and often occur in vast concentrations, but there seems no obvious correlation between their occurrences and those of the pseudoscorpion species. Surprisingly small accumulations of material can be productive of pseudoscorpions, as at Aberllolwyn, Llanfarian (22/587772) where c. 0.5 cubic metres of hay and debris in a concrete feeding-trough in a cowshed otherwise empty of hay or straw contained Allochernes, Cheiridium and Pselaphochernes. The richest single building so far sampled was a large Dutch barn on the north side of Troed-yr-aur farm (22/327454) where the sample contained 39 Cheiridium, 29 Allochernes, 16 Dinocheirus, 5 Chthonius and 2 Lamprochernes.

SPECIES ACCOUNTS.

Chthonius ischnocheles - Thirty-five sites in twenty-nine tetrads. Widespread in Ceredigion but not yet found in the uplands. It occurs in a much greater range of habitats than any other species and is often found in very dry sites, such as leaf-litter in sessile oak coppice where the other widespread species in Ceredigion, Neobisium muscorum, scarcely seems to occur. The most usual habitats are among moss and litter in woods, under stones in marshy sites, among rubble on waste ground, railway embankments, lead mines etc., and in hay barns and stables where it is the fourth commonest species. Other sites include rubble at the top of the saltmarsh in Aberystwyth harbour (22/582811) and debris under a wasps' nest in a lime pollard at Plas Gogerddan (22/630838). The species is widespread in Britain except for the extreme north.

Neobisium maritimum - 2 sites in 2 tetrads. Found by DC Boyce & AP Fowles on the College Rocks at Aberystwyth (22/580817) and on the shore just north of Clarach (22/584841) (Fowles 1989). This species inhabits the inter-tidal zone, living in air pockets in rock crevices and feeding chiefly on Collembola. The same collectors have searched for it in vain in a number of other sites. The College Rocks is the most sheltered and generally the richest bit of rocky shore in Ceredigion, and Clarach Bay is also comparitively sheltered, and it may be that most other sites are too exposed. The species has an Atlantic distribution and occurs from Devon northwards to Barra in the Outer Hebrides, as well as around the coasts of Ireland and western France.

Neobisium muscorum - 48 sites in 37 tetrads. Widespread even in the uplands where there are several records up to 650 metres a.s.l. Its chief habitats are litter and moss in woods and marshes, grass tussocks, heather clumps and under rotting wood and fallen bark, as well as under stones. It also occurs under driftwood and stones at the top of saltmarshes. It is especially easy to find in accumulations of leaf-litter in damp hollows, and has also been found in birds' nests on the ground and in badger litter at sett entrances. It seems more restricted to damp habitats than Chthonius, and was noticeably less easy to find in the dry summer of 1989 than the latter; it has not been recorded from any Ceredigion farm buildings. The species is more or less ubiquitous in Britain. (Many Ceredigion specimens have a rather prominent protuberance on the front margin of the cephalothorax that can be mistaken for an epistome, an anatomical feature which is in fact absent or rudimentary in this species.)

Roncus lubricus - 6 sites in 6 tetrads. Three of the records are from woodland, the most usual habitat for this species - under bark on a windblown tree in sessile oak woodland in Cwm Cyneiniog (22/699882); in the Wyre dingle below Lledrod (22/644710) under a fallen branch; and in a pitfall trap in the Coed Rheidol sessile oak coppice (22/741778). It has also been found under rubble at the top of the saltmarsh in Aberaeron (22/457627) and Aberystwyth (22/582811) harbours. Very unusually, a single specimen was found in old musty hay in a stone barn at Bronwydd Farm (22/354433). The species is probably genuinely sparsely distributed in Ceredigion. It occurs only in the southern half of Britain, chiefly along the south coast and in the south-east.

Roncocreagris cambridgei - 2 sites in 2 tetrads. Both records are coastal, one from a cock's-foot Dactylis glomerata tussock on a grassy boulder clay slope above the sea at Cwm Cilfforch (22/438617), the other from litter and moss in a rather dry flush with meadowsweet Filipendula ulmaria on a grassy cliff slope north of Coybal, New Quay (22/370592). The species has an Atlantic distribution and in Britain is predominantly coastal from Hampshire round to northwest Scotland.

Cheiridium museorum - 13 sites in 12 tetrads. Known as Aristotle's book scorpion, as it was first described by the philosopher who observed it between the pages of books (where it preys on psocids, or booklice), this minute, dark, brick-red species was found in 13 of the 47 farm buildings sampled in Ceredigion. It is probably ubiquitous in such sites, and even occurs at several upland farms. It seems to favour very dry accumulations of hay and straw (it was in four of the five lofts sampled) and is often the only species present in these sites. It was also found in two swallows' nests and a jackdaw's nest in the lofts, and in hens' nests of straw in an outbuilding. The species is recorded sparingly from most parts of Britain, in a great range of synanthropic sites, and is certainly overlooked and greatly under-recorded.

Lamprochernes nodosus - 5 sites in 5 tetrads. Four of the records are from hay barns, where the species was found in small numbers, always associated with Allochernes powelli and sometimes also with other species. Two sites were concrete-floored barns, another was a Dutch barn set apart from the farmyard with damp hay on an earth floor, and another was the big earth-floored Dutch barn at Troed-yr-aur farm (22/327454). The fifth record is from an old manure heap at Felin-wynt (22/227499). The species is widespread in Britain but is scarce in the west and absent from much of the north; it is especially characteristic of compost and old manure heaps.

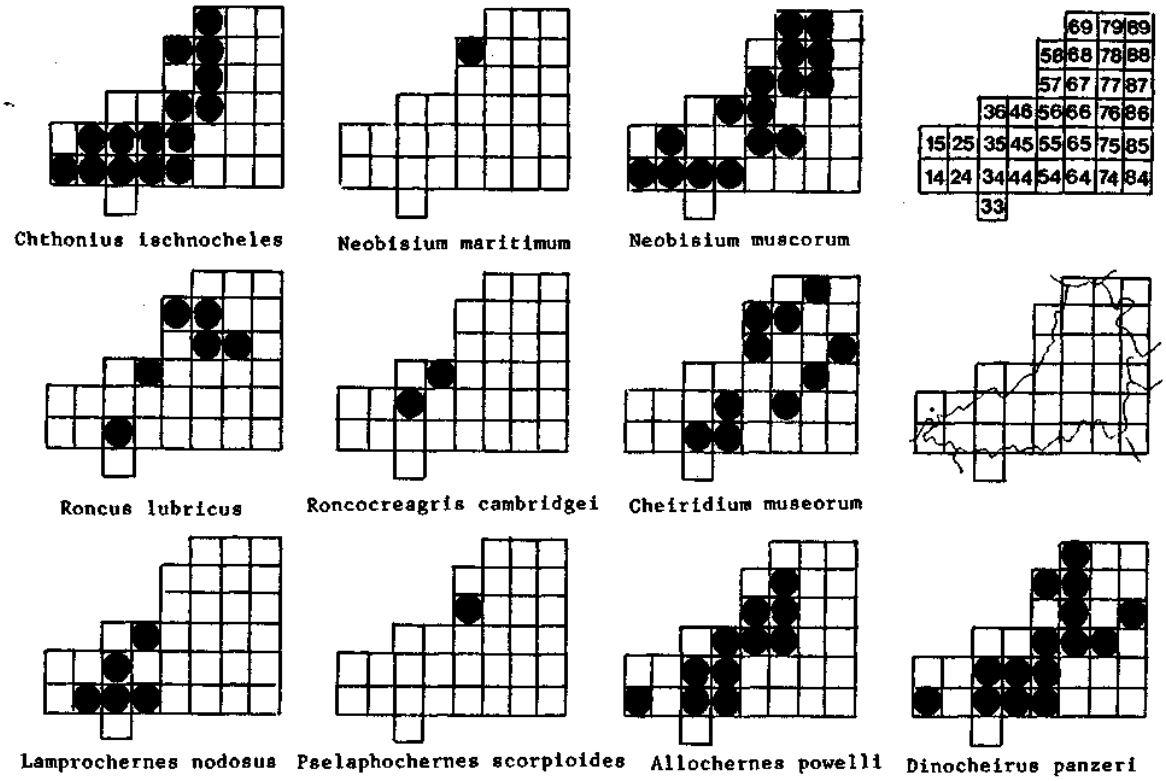
Pselaphochernes scorpioides - 1 site. A single deutonymph (confirmed by Legg) was found, along with Allochernes and Cheiridium, in the small amount of very old dry hay and debris in a long-disused feeding-trough in a cowshed at Aberllolwyn (22/587772). It is usually found in compost and manure heaps, in deadwood and in wood ants' (Formica rufa) nests. Its general British distribution is similar to that of Lamprochernes although it has fewer records.

Allochernes poweli - 13 sites in 13 tetrads. Found in 13 of the 47 farm buildings sampled, it is half as common as Dinocheirus but was associated with that species in all but two of its occurrences. It was not found in such very dry conditions as Cheiridium, nor at upland farms like Dinocheirus, it seems to favour old hay, rather than straw. It occurs in greater abundance than any of the other species, over 100 being found in the standard samples from three sites; never more than 54 Dinocheirus and 39 Cheiridium (the other two most abundant species) were found in the samples. Allochernes has been recorded from scattered sites in the southern half of Britain, in barns and stables, but is presumably very under-recorded.

Dinocheirus panzeri - 25 sites in 22 tetrads. Found in over half of the farm buildings sampled, and almost twice as common as any other species there. It is probably more or less ubiquitous in Ceredigion, even in the uplands. Never as abundant as Allochernes can be, it occurs in barns and stables usually with hay at least two years old, especially in debris on the floors, sometimes in quite damp conditions, and was only once found in a dry loft. Dinocheirus occurred on its own in seven sites and was associated with Chthonius in eight sites, and with Cheiridium in three. It is recorded from much of England, and from southern Scotland, but not from south-west England and it has not previously been recorded from Wales. As well as haybarns it is known from grain stores, pigeon lofts, hen houses, nests and even rotting trees.

ACKNOWLEDGEMENTS:

I am grateful to Adrian Rundle for teaching me how to identify pseudoscorpions and for naming many of them for me; to Gerald Legg for confirming the identity of many other specimens, especially early instars; to John Bratton for references; to David Boyce and Adrian Fowles for many specimens and records; and to all the farmers who have allowed me to sieve their hay.



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SIPHONAPTERA

A BRIEF SUMMARY OF THE FLEAS OF THE VICE-COUNTIES OF CARDIGAN, CARMARTHEN & PEMBROKE AND THE ISLANDS OF CARDIGAN, RAMSEY, SKOKHOLM & SKOMER - R S GEORGE

The fleas of these areas are not well recorded, except possibly those of Skokholm and Skomer. There has been only one collection from Cardigan Island and on two occasions from Ramsey Island. The flea lists of the mainland vice-counties result largely from haphazard gatherings and as any self-respecting vice-county should have 40+ species none of them quite reach the 75% mark. In the following notes the charts give a quick reference, the more detailed lists give the localities and collectors, and the list of references covers the sources consulted and provides a bibliography for flea records from the Dyfed vice-counties. The maps show the 10-km square distribution (open circles indicate pre-1970 records, closed circles indicate records from 1970 onwards) for all species and sub-species recorded from more than three squares, whilst grid references are given in the text for species not mapped (post-1969 records are emboldened). Island lists are produced seperately from the vice-county lists. It is my hope to produce seperate papers in the future for each of the Welsh vice-counties and one for all of the Welsh islands.

FLEA RECORDS:

Amalaraeus penicilliger mustelae (Dale) - [Host: Voles]. CARDIGAN - Lluest farm, Llanbadarn Fawr(KCW); Gorsgoch (FBE). PEMBROKE - Newgale (MLA); Eglwyswrw (JC); Pelcomb Bridge (DH); Cwm Dewi, Llangloffan Fen, Goodwick, Dowrog Common, Castlemartin Corse, Cors Penally (all WPIS). SKOMER - (FJC, DS). RAMSEY - (DS).

Archaeopsylla e. erinacei (Bouche) - [Host: Hedgehogs]. CARDIGAN - Llanbadarn Fawr (PMM); Talsarn (KCW). CARMARTHEN - Llanelli (RR). PEMBROKE - Marloes (DS); Crosswell (RR).

Ceratophyllus columbae (Gervais) - [Host: Rock dove]. SKOKHOLM (12/70) - A single female found loose (RR). Unfortunately, in the preparation as a slide specimen, the spermatheca and spermathecal tubes have become extremely indistinct. I can only tentatively allocate it to this species.

Ceratophyllus borealis Rothschild - [Host: Ground-nesting birds, especially wheatear]. CARMARTHEN - Laugharne Burrows (22/31) (JFT). SKOKHOLM (12/70) - (PC, PED, GS). SKOMER (12/70) - Usher (1968) reports that I gave him a specimen for illustration from this island. I have lost my notes of this event but I suspect that the specimen was one given me by GB Thompson and, in fact, came from Skokholm.

Ceratophyllus f. farreni Rothschild - [Host: House martin]. CARDIGAN - Llangwyryfon (22/67) (FBE).

Ceratophyllus gallinae (Schrank) - [Host: Many birds]. CARDIGAN - Borth (APF); Furnace (APF). CARMARTHEN - Laugharne (JFT); Llanwrda (DM); Pumpsaint (MG). PEMBROKE - Eglwyswrw (JC); Marloes (DS). SKOKHOLM - (PED, GS, EG).

Ceratophyllus garei Rothschild - [Host: Ground-nesting birds]. CARDIGAN - Ynys Eidiol, Cors Caron (both WPIS). CARMARTHEN - Laugharne Burrows (JFT). PEMBROKE -Castlemartin Corse (WPIS). SKOKHOLM - (DS, EG). SKOMER - (DS).

Ceratophyllus garei x borealis - [Host: Wheatear]. CARMARTHEN - Laugharne Burrows (22/31) (JFT). PEMBROKE - Castlemartin Corse (11/89) (WPIS).

Ceratophyllus hirundinis (Curtis) - [Host: House martin]. CARDIGAN - Llangwyryfon (22/67) (FBE).
Ceratophyllus rusticus Wagner - [Host: House martin]. CARDIGAN - Llangwyryfon (22/67) (FBE).

Ceratophyllus styx jordani Smit - [Host: Sand martin]. CARDIGAN - Tre-cefl,Tregaron (22/65) (APF).

Ceratophyllus vagabundus insularis Rothschild - [Host: Corvidae and gulls]. CARDIGAN ISLAND (22/15) - (APF). SKOKHOLM (12/70) - (GS). SKOMER - (12/70) (DS).

Ctenocephalides canis (Curtis) - [Host: Cats and dogs]. CARDIGAN - Llanbadarn Fawr (KCW); Bow Street, Ponterwyd, Cwm Ystwyth, Wig-wen (all JJJ). CARMARTHEN - Llwynhendy (WDW). PEMBROKE - Haverfordwest (JC).

Ctenocephalides f. felis (Bouche) - [Host: Cats and dogs]. CARDIGAN - Llanbadarn Fawr (KCW); Talybont, Tre'r-ddol (both JJJ). CARMARTHEN - Bynea, Burry Port (both WDW); Dryslwyn (DCH); Llandybie (GH).

Ctenophthalmus bisoctodentatus heselhausi (Oudemans) - [Host: Moles]. CARDIGAN -Llanbadarn Fawr (22/68), Talsarn (22/55) (both KCW); Aberystwyth (22/58) (GD); Llanon (22/56) (APF).

Ctenophthalmus n. nobilis (Rothschild) - [Host: Small rodents and insectivores]. PEMBROKE - St. David's (FJC)j Castlemartin Corse, Aber Mawr (both WPIS). SKOKHOLM - (RJB, GS, TDA). SKOMER - (HMH, FJC, PT). RAMSEY - (DS).

Ctenophthalmus n. vulgaris Smit - [Host: as above]. CARDIGAN - Llanbadarn Fawr, Foelallt (both KCW); Gorsgoch (FBE); Aberystwyth (GD). PEMBROKE - St. David's (FJC). SKOKHOLM - (RAD, GS). SKOMER - (DS, RP).

Ctenophthalmus nobilis ssp. - [Host: as above]. Females only as specimens are not determinable to subspecific level in this sex. Localities only where no males determinable to ssp. have been recorded. CARDIGAN - Cors Caranod, Rhos Rydd (both WPIS); Llanon (APF). CARMARTHEN - Tywi (per GBT). PEMBROKE - Eglwyswrw (JC); Pen-y-cwm, Newgale (both MLA); Freshwater East (RP); Cwm Dewi, Goodwick (both WPIS).

Ctenophthalmus nobilis agg. - [Host: as above]. SKOMER - During 1961 and 1962 D. Saunders collected a considerable number of this flea for me from the Skomer Vole. They included a full range from C. n. nobilis through the intermediates to C. n. vulgaris and, in my opinion, the population can be ascribed to C. nobilis agg. rather than to attempt to subspecifically identify individuals.

Dasypsyllus g. gallinulae (Dale) - [Host: Many birds]. CARMARTHEN - Laugharne (JFT); Llansadwrn (FBE). PEMBROKE - Eglwyswrw (JC); Marloes (DS); Cors Penally, Goodwick (both WPIS). SKOKHOLM - (PED, GS, RML).

Doratopsylla d. dasyenema (Rothschild) - [Host: Shrews]. CARDIGAN - Llanbadarn Fawr (KCW); Rhos Llawr-cwrt (WPIS). PEMBROKE - Pen-y-cwm (MLA); Cors Penally, Western Cleddau, Llangloffan Fen (all WPIS). SKOMER - (HMH, DS).

Hystrichopsylla t. talpae (Curtis) - [Host: Small rodents and insectivores]. CARDIGAN - Llanbadarn Fawr (KCW); Jubilee Bridge (RSG); Ynys Eidiol (WPIS). PEMBROKE - St. Ishmaels (per NMW); Eglwyswrw (JC); Pelcomb Bridge (DH); Cors Penally (WPIS). SKOKHOLM - (RJB, RAD, EG, MB). SKOMER - (DS).

Ischnopsyllus hexactenus (Kolenati) - [Host: Long-eared bat]. PEMBROKE - Upton (22/00), Nash House (22/00) (both AMH).

Ischnopsyllus octatenus (Kolenati) - [Host: Pipistrelle]. CARDIGAN - Between Capel Bangor and Gogerddan (22/68) (KCW). PEMBROKE - Castlemartin (11/99) (NRB); Orielton (AMH); Haverfordwest (12/91) (FJC).

Ischnopsyllus s. simplex Rothschild - [Host: Whiskered and Natterer's bats], CARDIGAN - Talybont (22/68) (IJ); Aberystwyth (22/58) (KCW). PEMBROKE - Upton Castle (22/00) (AMH, RES).

Megabothris turbidus (Rothschild) - [Host: Voles]. CARMARTHEN - Tywyn Burrows (IKM). PEMBROKE - Eglwyswrw (JC); Llangloffan Fen, Portheiddy Moor (both WPIS). SKOMER - (FJC, PT, DS).

Megabothris walkeri (Rothschild) - [Host: Voles]. CARDIGAN - Jubilee Bridge (RSG); Gorsgoch (FBE); Llangorwen (KCW); Comin Esgairmaen, Cors Gorsgoch, Cors Caranod (all WPIS). CARMARTHEN - Nantgaredig (FBE), Tywi (per GBT). PEMBROKE - Pen-y-cwm (MLA); Western Cleddau, Castlemartin Corse, Treffeiddan Moor (all WPIS).

Monopsyllus s. sciurorum (Schrank) - [Host: Red squirrel]. PEMBROKE - Smit (1957) notes that he has seen specimens. No further data.

Nosopsyllus fasciatus (Bosc) - [Host: Brown rats]. CARDIGAN - Llanbadarn Fawr (KCW); Cwrt Newydd (FBE); Llangeitho (KCW). CARMARTHEN - Pumpsaint (FBE). SKOKHOLM - (RAD).

Orchopeas h. howardi (Baker) - [Host: Grey squirrel]. CARDIGAN - Tre'r-ddol (22/69) (FBE); Trawscoed (22/67) (BWS); Aberystwyth (22/58) (KCW).

Ornithopsylla laetitiae (Rothschild) - [Host: Manx shearwater]. SKOKHOLM (12/70) - (HMS, GS, HMH). SKOMER (12/70) - (LG).

Palaeopsylla minor (Dale) - [Host: Mole]. CARDIGAN - Llanbadarn Fawr (KCW); Aberystwyth (GD); Borth (JAF). PEMBROKE - Rosemarket (DS).

Palaeopsylla s. soricis (Dale) - [Host: Shrews] - I am assuming that this is the subspecies present in the area and not P. s. vesperis. CARDIGAN - Glanyrafon (APF); Llanbadarn Fawr (KCW); Aberystwyth (GD); Rhos Llawr-cwrt, Cors Gorsgoch (both WPIS). PEMBROKE -Pelcomb Bridge (DH); Dyffryn Gwaun, Western Cleddau, Cors Penally, Goodwick, Aber Mawr, Castlemartin Corse (all WPIS). RAMSEY - (DS). SKOMER - (DS).

Paraceras m. melis (Walker) - [Host: Badger]. CARDIGAN - Aberystwyth (KCW); Llandysul, Capel Seion (both PMM). CARMARTHEN - Cilycwm (per NMW); Penlan Chwitor (JHM). PEMBROKE - Gumpreston (PMM); Haverfordwest (JC); Walwyn Castle, Milford Haven, Houghton (all JHM).

Pulex irritans L. - [Host: Humans]. CARDIGAN - Aberystwyth, Llanbadarn Fawr (both KCW). PEMBROKE - Jameston (PMM); Marloes (DS); Haverfordwest (FJC).

Rhadinopsylla i. isacantha (Rothschild) - [Host: Voles]. PEMBROKE - Eglwyswrw (22/13) (JC).

Rhadinopsylla pentacantha (Rothschild) - [Host: Field mice, voles]. CARDIGAN - Llandysul (22/44) (KCW). PEMBROKE - Eglwyswrw (22/13) (JC). RAMSEY (12/72) - (RA). SKOMER (12/70) - (HMH, DS).

Spilopsyllus cuniculi (Dale) - [Host: Rabbit]. CARDIGAN - Cross Inn (AMB); Llangeitho (SJT); Caellan (KCW); Cenarth/Llandygwydd (TGW); Aberystwyth (GD). CARMARTHEN - Pencnwe Llanboidy (KCW); Ammanford (JHM); Carmarthen (FHF); Llidiart Nenog (AMB); Llanelli (RR). PEMBROKE - Llawhaden (AMB); Crosswell (RR). RAMSEY - (RA). SKOKHOLM - Several reports that it is not on this island thus contributing to the absence of myxomatosis. SKOMER - (RML, GBT, PT).

Typhloceras poppei Wagner - [Host: Field mice]. PEMBROKE - Newgale (12/82) (MLA); Portheiddy Moor (12/83) (WPIS).

RECORDERS:
Miss ME Lynn Alien (MLA), R Allinson (RA), RJ Berry (RJB), M Betts (MB), A Mead Briggs (AMB), NRH Burgess (NRB), J Comont (JC), P Condor (PC), FJ Cox (FJC), T D'Anjou (TDA), G Davies (GD), PE Davis (PED), RA Davis (RAD), FB Edwards (FBE), JA Fowler (JAF), AP Fowles (APF), FW Frohawk (FWF), RS George (RSG), E Glynn (EG), L Goodson (LG), M Greenwood (MG), HM Hallett (HMH), DC Holmes (DCH), G Hopkins (GH), D Hunford (DH), AM Hutson (AMH), I Jones (M), JJ Jones (JJJ), RM Lockley (RML), Mrs D Mellows (DM), PM Miles (PMM), IK Morgan (IKM), JH Morgan (JHM), National Museum of Wales (NMW), R Parsons (RP), R Rees (RR), HM Salmon (HMS), D Saunders (DS), G Stanfield (GS), RE Stebbings (RES), BW Swine (BWS), JF Thomas (JFT), GB Thompson (GBT), P Turner (PT), SJ Turpin (SJT), KG Walton (KCW), Welsh Peatland Invertebrate Survey (WPIS), TG Williams (TGW), WD Williams (WDW).

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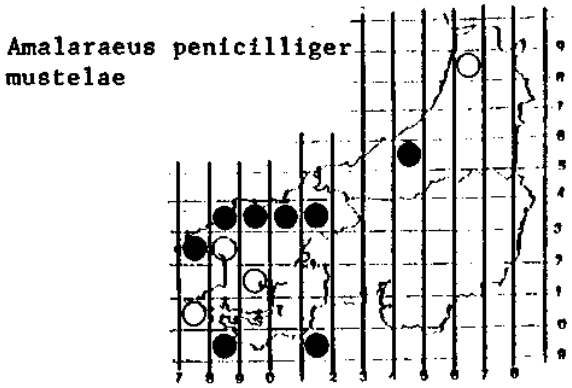
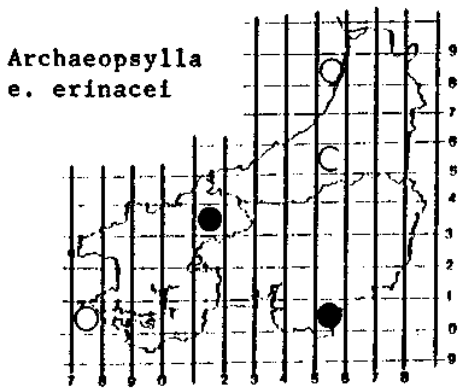
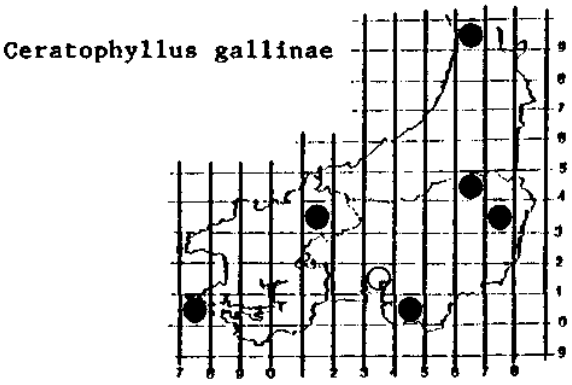
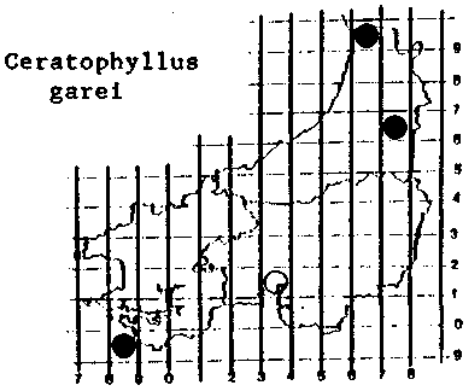
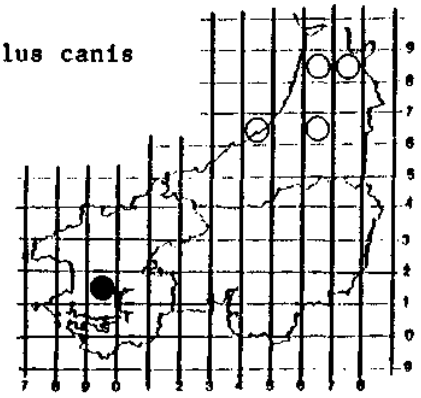








Ctenocephalus canis



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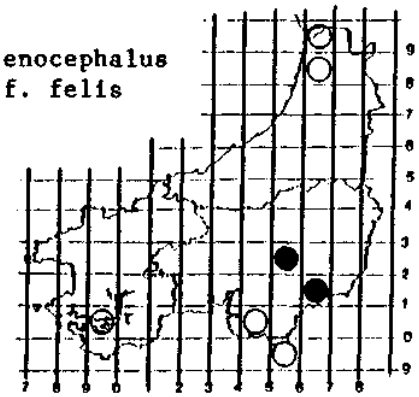
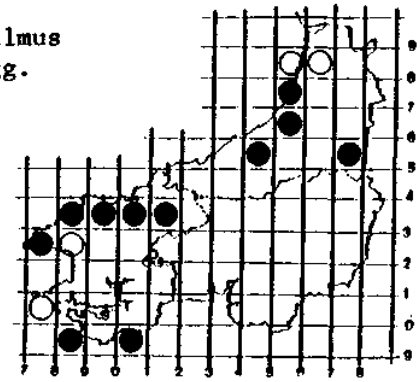


Ctenophthalmus nobilis agg.



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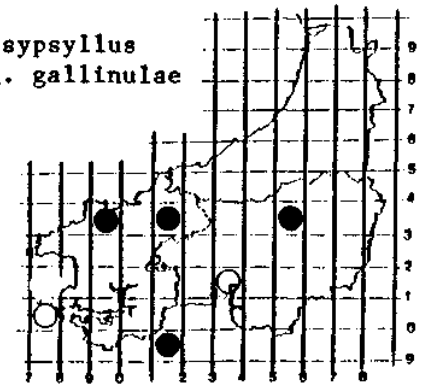
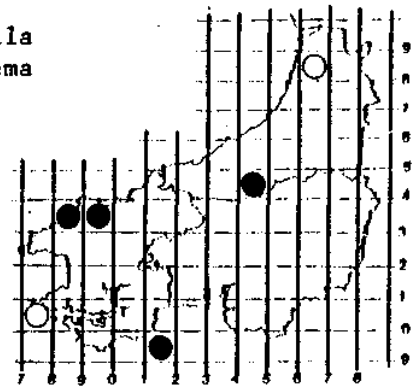
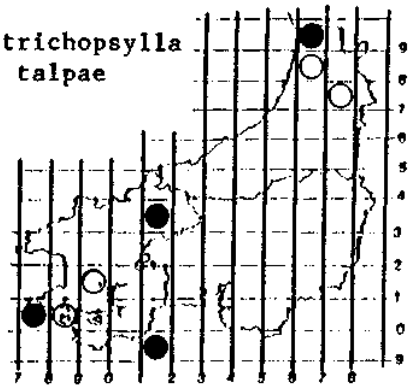


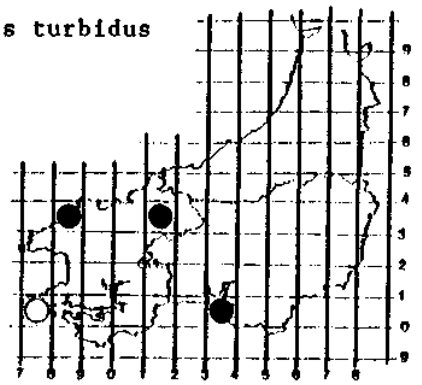
Doratopsylla d. dasycnema



Hystrichopsylla t. talpae



Megabothris turbidus



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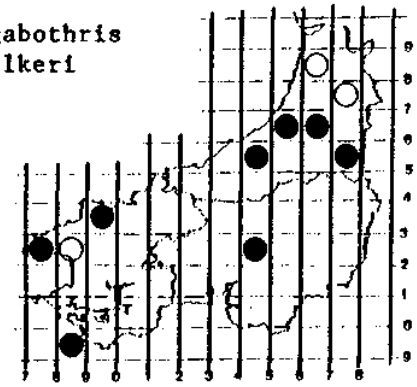
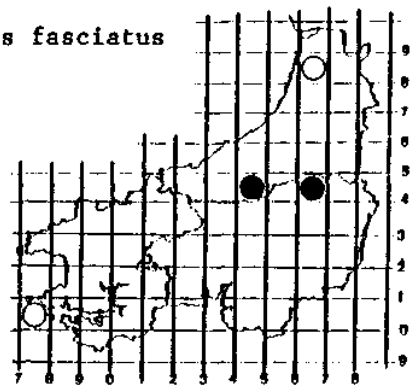
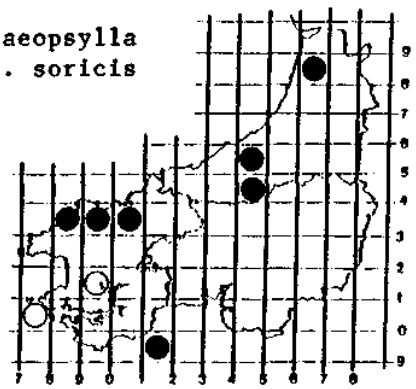


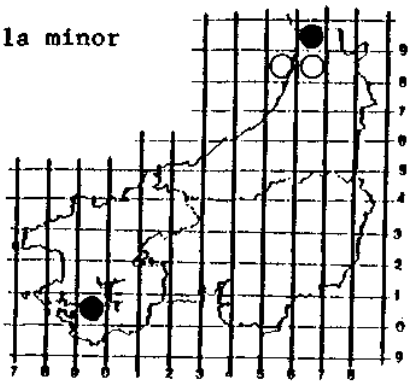
Nosopsyllus fasciatus



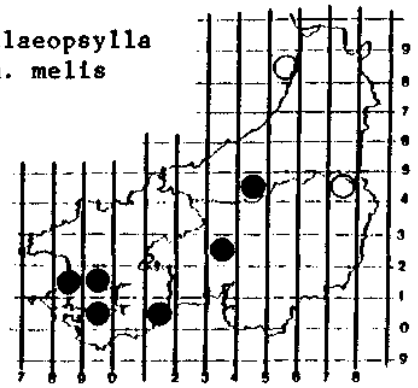
Palaeopsylla s. soricis



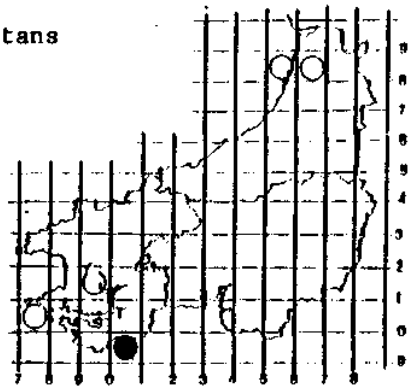
Palaeopsylla minor



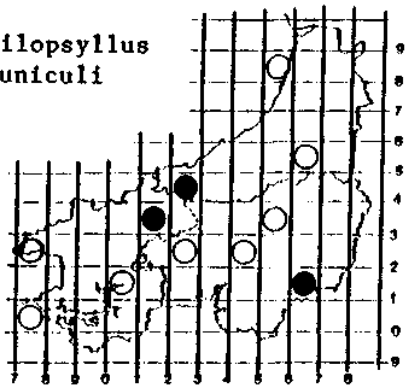
Palaeopsylla m. melis



Pulex irritans



Spilopsyllus cuniculi



Notes for Checklist;

The arrangement of species and subspecies in the checklist is that of Smit (1957).
"S" = previously reported for that area in Smit (1957).
"N" = additional vice-county/island records in my files, some of which have been published.

CHECKLIST	Vice-county			Island			
	Cardigan	Carmarthen	Pembroke	Cardigan	Ramsey	Skokholm	Skomer
Pulex irritans	N		S				
Archaeopsylla e. erinacei	N	N	S				
Ctenocephalides canis	N	N	N				
Ctenocephalides f. felis	N	N	N				
Spilopsyllus cuniculi	S	S	N		N		S
Ornithopsylla laetitiae						S	S
Hystrichopsylla t. talpae	N		N			N	S
Typhloceras poppei			N				
Rhadinopsylla i. isacantha			N				
Rhadinopsylla pentacantha	S		S		N		S
Doratopsylla d. dasycnema	N		N				
Palaeopsylla minor	S		N				
Palaeopsylla s. soricis	S		N			S	S
Ctenophthalmus n. nobilis			S		N	N	N
Ctenophthalmus n. vulgaris	S		S			N	N
C. n. nobilis x vulgaris			N			N	S
C. bisoctodentatus heselhausi	s						
Ischnopsyllus octatenus	N		S				
Ischnopsyllus s. simplex	N		N				
Ischnopsyllus hexactenus			N				
Paraceras m. melis	N	N	N				
Dasypsyllus g. gallinulae		N	N			S	
Amalareus penicilliger mustelae					N	S	
Orchopeas h. howardi	N						
Nosopsyllus fasciatus	N	N	S			S	
Megabothris turbidus	S	N	N				S
Megabothris walkeri	N	N	N				
Monopsyllus s. sciurorum			S				
Ceratophyllus gallinae	N	N	S			S	
Ceratophyllus rusticus	N						
Ceratophyllus hirundinus	N						
Ceratophyllus f. farreni	N						
Ceratophyllus styx jordani	N		S				
Ceratophyllus borealis.		S				S	N?
Ceratophyllus garei	N	S	N			N	N
Ceratophyllus garei x borealis			N				
Ceratophyllus vagabundus insularis				N		N	N
Ceratophyllus columbae						N?	

FIELD MEETING - WEST WILLIAMSTON NATURE RESERVE (22/026060) VC 45, 10 JUNE 1989 - R ELLIOTT

Seven members of the Dyfed Invertebrate Group met at the small carpark at the entrance to the Reserve on a rather overcast but dry day and proceeded across the fields to the Reserve. This Dyfed Wildlife Trust Reserve has already been adequately described (DIG 11: 7-10) and so no further description is necessary here. Despite the generally overcast conditions that persisted throughout the day, ninety-two species of invertebrates were recorded, of which fifty-seven had not previously been recorded on the Reserve, a valuable addition to the records of the site.

The seven species of Isopoda recorded included the pill-louse Armadillidium nasatum which is a distinctively-marked and comparatively local species in Wales, generally confined to limestone or coastal sites. Also recorded was Trichoniscoides saeroeensis, a local coastal species which is very small, whitish in colour, and with red eyes. It is usually found under stones embedded in turf just above the high water mark.

Insects formed the bulk of the records with a total of 68 species from six Orders. Assiduous searching of the leaves of many types of plants revealed twelve species of aphids, some (such as Acyrthosiphon loti and Macrosyphum cholodkovskyi) so specialised that their whole life-cycle takes place on a single genus, or even species, of plant. All the species of aphids recorded by CS Wood-Baker were new records for the Reserve. As the Lepidoptera have been well recorded in comparison to other invertebrate groups, it was a pleasant surprise to encounter a new species, the common Brown Silver-line Petrophora chlorosata. The other nine species recorded were all fairly common and had been recorded on the Reserve many times before. Stephen and Ann Coker were most interested in Diptera, chiefly hoverflies, and together with lan Morgan identified 14 species. They included the uncommon saltmarsh species Platycheirus immarginatus which has been recorded from scattered localities along the coast of the three Dyfed vice-counties.

The largest single group recorded were the Coleoptera with 25 species, some of which are quite common like the figwort weevil Cionus scrophulariae and the cardinal beetle Pyrochroa serraticornis. Polydrosus pulchellus is a species which is widespread but uncommon around the British coasts where it feeds on a broad range of saltmarsh plants. At West Williamston it was found to be exceptionally common on Beta sp. and Sueda sp. Other beetles recorded are much less common. Amphimallon ochraceus is a scarce scarabeid (or chafer) which is found mainly on unimproved grassland of coastal cliffs and chalk downlands in southern England and Wales, with its British headquarters in west Wales. Brachygluta simplex, recorded by Adrian Fowles, is another rare species. It is a tiny pselaphid beetle found in a range of coastal habitats such as sand dunes, shingle and saltmarshes but is only known from southern England and the Dyfed coast. The saltmarsh yielded a number of interesting beetles including the carabids Amara convexiuscula, Pogonus chalceus, Dicheirotrichus gustavi and Bembidion laterale and the impressive rove-beetle Bledius spectabilis which inhabits small burrows in the upper saltmarsh and emerges between tides to graze on mats of algae.

FIELD MEETING - RAE ABERPORTH (22/244526) VC46, 15 JULY 1989 - A P FOWLES

The opportunity to investigate the cliff-top coastal heath and hanging oakwoods of this restricted-access MOD property was gratefully accepted by twenty-four members of the Dyfed Invertebrate Group and the British Entomological and Natural History Society. Glorious sunshine graced the full six hours of our visit and made hard work of some of the more ambitious explorations of the woodlands but also turned the stroll along the cliff-top heath into an extremely pleasant outing. The weather did work against us though, in that the prolonged dry spell (which was soon to come to an end) had driven many invertebrates underground to escape dessication and there was also a distinct, and less easily-explained, shortage of flying insects. Nonetheless, between us we managed to gather much useful information on the invertebrate fauna of the Aberporth cliffs and, with a few records still outstanding, a total of 133 species was recorded. Although a moth-trap has been in operation here for the Rothamsted Insect Survey since 1982, very little is known about most other invertebrate groups present on the Establishment.

It did not prove to be a day for discovering rarities but, in a vice-county context, there were several interesting species recorded. Butterflies were generally in short supply but thirteen species were seen during the day, including small numbers of graylings Hipparchia semele and dark green fritillaries Argynnis aglaja. More unexpected was the sighting of a hummingbird hawkmoth Macroglossum Stellatarum, hovering at flowers on a sunny bank. This was one of the fore-runners of a small immigration to Ceredigion in mid-to-late July. The previous list of fourteen species of hoverflies was increased to thirty - a respectable total considering the dryness of the habitat. Several specimens of the small wasp-mimic Chrysotoxum arcuatum were seen on the heath above the Allt-goch oakwood. This is a rather northern species in Britain and there have only been a handful of records for Dyfed so far. The capture of a single Eristalinus aeneus was surprising as it must have strayed some distance from its breeding habitat amongst algae in brackish pools or heaps of rotting seaweed. E. aeneus is a nationally scarce hoverfly which is known from a few of the coves in the south-west of the county. Other useful records were provided by Eristalis abusivus and Paragus haemorrhous, two species which are easily-overlooked and hence under-recorded in Ceredigion.

Past visits have shown the scarce robber-fly Leptarthrus brevirostris to be common on the coastal heath at Aberporth but there was no sign of it during our visit, perhaps we were a little too late in the season, and the only other dipteran of interest reported was the snail-killing fly Limnia unguicornis. As a larva this species is believed to feed on amber snails Succinea spp and presumably does not breed on the RAE base because of the lack of wetland habitats. It has not been recorded in Ceredigion before but the Sciomyzidae are a neglected family in west Wales and much remains to be learnt about their habitat preferences. Another under-worked group of insects is the bees and wasps - three handsome but common species seen during the day were the jewel-wasp Chrysis rudii, the mason wasp Ancistrocerus scoticus and the spider-hunting wasp Anoplius nigerrimus. A. scoticus is chiefly found in coastal habitats in northern and western districts and is probably a host for C. rudii which is known to parasitise members of the genus Ancistrocerus.

Six species of Orthoptera were recorded, including a colony of mottled grasshoppers Myrmeleotettix maculatus on the coastal heath (a typical habitat) and a female speckled bush-cricket Leptophyes punctatissima in a sunny bramble thicket in the steep Cribach Bay ashwood. An open, heathy clearing near the top of the slopes here produced several workers of the ant Leptothorax acervorum. Colonies of this unobtrusive ant are frequently found in dead heather stems but there are few known sites for the species in Ceredigion. Also present here was the spider Zygiella atrica, which is usually associated with heathlands. Twenty-one species of spiders were recorded in total, bringing the site list up to thirty, but all were common and anticipated inhabitants of the coastal habitats explored.

Beetles also produced few surprises and the scarcity of species in families such as the ground-beetles was evidently a result of the dry conditions. However, the leaf-beetle Lamprosoma concolor was noteworthy as this nationally scarce inhabitat of open habitats had only previously been recorded on one occasion in the vice-county. The weevil Otiorhynchus rugostriatus was a new, but not unexpected, county record. The hot weather also kept snails and woodlice at bay but, despite this, there were additions to the site-lists for both of these well-worked groups. The arboreal snail Balea perversa was found in some abundance under the loose bark of oak trees at the top of Allt-goch and the pill-woodlouse Armadillidium nasatum, a local species of coastal localities in south-west Ceredigion, was found commonly in several places on the base, chiefly in synanthropic situations.

The day's results provided a good insight into the composition of the invertebrate fauna of the Aberporth cliffs without producing any startling surprises. This is probably due in part to site-management as the coastal heath is maintained in good condition by mowing and the lack of grazing or public access produces even-aged stands of vegetation without pockets of erosion. Many of the more interesting inhabitants of coastal heath in Dyfed are thermophilous species which require bare sandy soil in which to burrow and will be unable to find suitable conditions for breeding at Aberporth. The hanging woods refused to yield up their secrets but perhaps they are too exposed to support a diverse fauna - further arduous attempts to descend into their depths are required. It's always nice to see a few rarities but it's just as important to document the characteristic fauna of a habitat and we certainly made a good start along those lines. It was a thoroughly enjoyable occasion and I'm sure all present will wish to join me in offering grateful thanks to Gwyn Williams (Chairman of the RAE Aberporth Conservation Committee) and his colleagues for giving so freely of their time to help make this day so successful.