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BULLETIN OF THE IRISH BIOGEOGRAPHICAL SOCIETY
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Bull. Ir. biogeog. Soc. No. 9.

EDITORIAL

Because of the high postal charges associated with mailing the Bulletin, the Committee decided in 1985 to reduce the journal's page size from A4 to A5. We hope that this new format meets with the approval of our members. Since many members may wish to bind issues 1 - 8 together, an index to them is currently being prepared by Mr. J. M. C. Holmes and the Editor.

This year, the Society will publish its first occasional publication viz. the Proceedings of the Postglacial Colonisation Conference held in University College, Cork, from 15-16 October 1983. The various articles contain original and stimulating views on this controversial aspect of Irish Biogeography and they will be of great interest to members. Further details may be obtained from the Hon. Treasurer, Mr. P. J. Foss, Department of Botany, University College, Belfield, Dublin 4.

This year's Bulletin is both a varied and an interesting one and on behalf of the Society, I wish to thank our authors for their contributions, my colleagues on the Editorial Sub-Committee (Dr. T. Curtis, Mr. P. J. Foss, Dr. M. C. Heslin and Dr. A. McNally) for their enthusiastic help with the editing and production of this issue, Mrs. Marian McNally for her excellent typing and the referees of the various articles. A word of thanks is also due to the Committee for their support and encouragement. We are deeply indebted to our sponsors for their generous support.

Manuscripts which authors wish to have considered for publication in Bulletin No. 10 should be submitted before 1st September 1986.

Bull. Ir. biogeog. Soc. No. 9.

INVERTEBRATES OF IRISH MIDLANDS RAISED BOGS: PART IV. NOTES ON TERRESTRIAL INSECTS.

Jervis A. Good

Introduction

Terrestrial insects were recorded from several Irish midland raised bogs during the summer of 1983 as part of a survey of their invertebrate fauna (Bond, 1984; Higgins, 1984; Reynolds, 1984). The sites studied include some of the few remaining sub-atlantic ombrotrophic raised bogs in Europe (Schouten, 1981). Mongan Bog, Co. Offaly (N 0330) was the site most studied. Three other sites were visited briefly: Clara Bog, Co. Offaly (N 2530); Carbury Bog, Co. Kildare (N 6737): and Moud's Bog, Co. Kildare (N 7818). The growth of Sphagnum on these bogs results in a typical hummock-and-hollow topography (Mitchell, 1976), the hollows often containing pools, and the hummocks dwarf shrubs especially Calluna. This variation in conditions provides microhabitats for both hygrophilous and xerophilous species (Markkula, 1981).

Results

To assess the importance of the ombrotrophic bog for terrestrial insects, it is useful to divide the recorded fauna into several categories: (1) Adventive species, which cannot survive on the bog, even temporarily; (2) Non-typical bog species, which, though they can survive temporarily on the bog, originate from the surrounding habitats, and would be absent or very rare if these habitats were not present; (3) Typical bog species, which can maintain their population on the bog, irrelevant of the surrounding habitats; and (3a) Unique bog species, which only occur on raised bogs.

In practice, however, in the absence of detailed autecological information, it is difficult to assign many species to one or other of these categories. Here such species are lumped into one group (Table 2), in contrast to obvious adventives (Table 1) and typical species (Table 3). Many of the species in this group are highly mobile predators/scavengers, and it is likely that most of these are non-typical, temporarily exploiting the

xerophilous microhabitats of the bog. Unfortunately, insufficient records exist from the other bogs apart from Mongan to make comparisons possible.

Discussion

While it was not possible to do so in this brief study, it is important to distinguish non-typical from typical species, in that the former may have a negative influence on the latter. In a study of Dorset heathlands, Webb et al. (1984) found that true heathland species persist best where there are fewest species invading from the surroundings. They conclude that it is preferable to have structurally less diverse vegetation surrounding a heathland. Clearly Mongan Bog does not fulfill this criterion. It is surrounded by several areas supporting relatively rich insect faunas. These include the margins of the bog with stands of Betula and Salix; the esker ridge containing copses of Corylus to the north; the River Shannon with an area of herb-rich callows grassland to the north-west; Finlough, a shallow calcareous lake with extensive Phragmites stands to the south; and meadows and pastures to the south and south-west. Whether or not the patchy nature of the bog hummocks would allow refuge for typical species, despite the immigration of non-typical species, remains to be seen.

The typical species (Table 3) include some rare Sphagnum-bog representatives. The grasshopper, Stethophyma grossum (L.) is local in Ireland (Cotton, 1982; De Courcy Williams, 1985), as is the tabanid fly, Chrysops sepulchralis (Fabricius) (Speight and Legrand, 1984), and the staphylinid beetle, Stenus brevipennis Thompson (Anderson, 1984).

As with the spiders (Higgins, 1984), no recognisable unique raised bog species were discovered, but such species may be represented amongst the groups not recorded here, for instance, amongst the hygrophilous soil-dwelling insects.

Conclusion

The possibility that Mongan Bog (being a preserved site) may not have a representative terrestrial insect fauna, due to interference from immigrants from surrounding habitats, needs to be examined. A comparative survey of the faunas of other raised bogs, including both drained bogs and those with less diverse surrounding biotopes than Mongan, would be very useful in this context. The results of such a survey would also give a clearer indication of what a typical Irish raised bog fauna is. Given that so few raised bogs are left in Ireland, it is to be regretted that such surveys were not conducted prior to the recent ecological destruction of many of these bogs.

Acknowledgements

I am most grateful to Kenneth Bond, Desmond Higgins and Dr. J. Reynolds for assistance with fieldwork, to Mrs. R. Blackith for identification of the Tachinidae, to Dr. J. Breen for identification of the Formicidae, to Desmond Higgins for identification of Bombus species, and to Dr. R. Anderson for confirming the identification of Stenus brevipennis. Dr. J. Reynolds, Mark Costello and Patrick Sleeman kindly read earlier drafts of this paper, and I am grateful for their comments. The B.E.S. and E.S.U. (T.C.D.) kindly provided financial help.

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TABLE 1: ADVENTIVE SPECIES RECORDED FROM RAISED BOGS.

HEMIPTERA

Acanthosomidae

Acanthosoma haemorrhoidale (L.) Mn7, Dc

Elasmostethus interstinctus (L.) Mn5, Dc

Pentatomidae

Pentatoma rufipes (L.) Mn6, Dc; Cl2, Dc

COLEOPTERA

Scarabaeidae

Aphodius rufipes (L.) Mn5, Mv

See Table 2 for abbreviations.

TABLE 2: SPECIES WHICH MAY BE ADVENTIVE, NON-TYPICAL OR TYPICAL RECORDED FROM RAISED BOGS.

DIPTERA

Tabanidae

Haematopota pluvialis (L.) Cb1, Dc; C11, Dc; Md1, Dc; Mn2, Dc

Hybomitra montana (Meigen) Md1, Dc

Conopidae

Sicus ferrugineus (L.) Md1, Dc

Tachinidae

Linnaemya vulpina (Fallén) Md2, Dc; Mn7, Dc

Gonia picea (Robineau-Desvoidy) Md2, Dc; Mn7, Dc

HYMENOPTERA

Tenthredinidae

Brachythops flavens (Klug) Mn6, Dc

TABLE 2 (CONTINUED)

Apidae

Bombus jonellus (Kirby) Mn5, DcC
B. hortum (L.) Mn5, DcC
B. lapidarius (L.) Mn5, DcC; C12, DcC
B. lucorum (L.) Mn5, DcC
B. muscorum (L.) Mn5, DcC

COLEOPTERA

Coccinellidae

Chilocorus bipustulatus (L.) C12, Dc; Mn5, Dc

Carabidae

Notiophilus aquaticus (L.) Cb1, Sw; Mn2, Dc
Pterostichus niger (Schaller) Mn5, Pt
P. nigrita (Paykull) Mn4, Pt

Silphidae

Necrodes littoralis (L.) Mn5, Mv
Nicrophorus investigator Zetterstedt Mn4, Mv, PtS
N. humator (Gleditsch) Mn4, PtS
N. vespillo (L.) Mn4, PtS
N. vespilloides Herbst. Mn4, PtS

Staphylinidae

Tachyporus hypnorum (Fabricius) Mn5, Sw
T. chrysomelinus (L.) Mn5, Sw
Deleaster dichrous Gravenhorst Mn5, Mv

Abbreviations used: Cb1: Carbury Bog, 20 vii 1983; Cb2: Carbury Bog, 1 viii 1983; C11: Clara Bog, 1 viii 1983; C12: Clara Bog, 1 ix 1983; Md1: Moud's Bog, 20 vii 1983; Md2: 1 viii 1983; Mn1: Mongan Bog, 14 vi 1983; Mn2: 14 vii 1983: Mn3: 20 vii 1983; Mn4: 1 viii 1983; Mn5: 24 viii 1983; Mn6: 1 ix 1983; Mn7: 25 ix 1983; Dc: direct capture; DcC: direct capture, feeding on Calluna; Mv: mercury-vapour light trap; Pt: ethylene glycol pitfall trap; PtS: as Pt, in which Sorex minutus L.

(pygmy shrew) fell and died; Sw: sweeping; Tl: Tullgren funnel soil extraction.
(Nomenclature in Tables 1-3 follows the second edition of Kloet and Hincks Checklist of British Insects (Handbk. Ident. Br. Insects. 11), Royal Entomological Society of London; representative specimens of species listed deposited in the National Museum of Ireland.

TABLE 3: TYPICAL BOG SPECIES RECORDED FROM RAISED BOGS

ORTHOPTERA

Acrididae

Myrmelotettix maculatus (Thunberg) Cb1, Dc; C12, Dc; Mn5, Dc
Stethophyma grossum (L.) Mn7, Dc

Tetrigidae

Tetrix undulata (Sowerby)Cb1, Dc; C12, Dc; Mn3, Dc

HEMIPTERA

Cercopidae

Neophilaenus lineatus (L.) Cb1, Sw; C12, Sw; Md1, Sw; Mn2, Sw

DIPTERA

Tabanidae

Chrysops relictus Meigen Cb1, Dc; Mn2, Dc; Md1, Dc
C. sepulchralis (Fabricius) Mn2, Dc

Syrphidae

Sericomyia silentis (Harris) C12, Dc; Mn6, Dc

Tachinidae

Tachina grossa (L.) Md1, Dc; Mn6, Dc

HYMENOPTERA

Formicidae

Myrmica ruginodis Nylander Cb2, Pt; Md2, Pt; Mn5, Pt

TABLE 3 (CONTINUED)

M. scabrinoidis Nylander Cb2, Pt; Md2, Pt; Mn5, Pt

COLEOPTERA

Carabidae
Carabus nemoralis O.F. Müller Mn2, Dc
C. granulatus L. Mn5, Pt

Staphylinidae
Stenus brevipennis Thompson Cb1, Tl
Drusilla canaliculata (Fabricius) Md2, Pt; Mn5, Pt

Curculionidae
Micrelus ericae Gyllenhal Cb1, Sw; Md1, Sw; Mn2, Sw

See Table 2 for abbreviations.

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THE IRISH DISTRIBUTION OF THE MYXOMYCETE CLASTODERMA PACHYPUS NANN.-BREM.

Roland McHugh

The Myxomycetes (acellular slime moulds) are a diverse and fascinating group. All Irish records of the genus Clastoderma are the results of oak bark cultures set up by the author. Bark techniques, which were introduced by Gilbert and Martin in 1933, have led to the discovery of numerous Myxomycete species, often of too small a size to be located in the field by conventional methods of search. Essentially, a chisel is used to remove portions of bark from living trees. These are immediately sealed in paper envelopes. In the laboratory, they are transferred to distilled water and allowed to soak overnight. Subsequently they are placed, cut side downwards, on filter papers in petri dishes. Periodic scanning with a lowpower stereoscope over the following weeks reveals the development of Myxomycetes. For maximum success mature trees are preferable and the bark should be well covered by epiphytic lichens and bryophytes; the choice of tree species is also significant. In Ireland the best results are obtained with oak; if this is not available ash, sycamore and horse chestnut are probably the next best alternatives. Myxomycetes obtained by this technique are said to be corticolous: a key to their identification by Mitchell (1980a, 1980b, 1981) is available.

A single sporangium of Clastoderma debaryanum Blytt, the type species, was harvested on 12 May 1980 from oak bark collected on 4 April near Abbeyleix (S 4183). The record was transmitted for publication to Ing and Mitchell (1980) and appears to be the only Irish occurrence. By contrast, the rarer C. pachypus Nann.-Brem. has appeared in hundreds. Two of its localities (Glen of the Downs and Knocksink Wood, Co. Wicklow) were also sent to Ing and Mitchell, but the species has subsequently appeared on bark from several other places and a full list is supplied here.

LOCALITY	GRID REFERENCE	BARK COLLECTED	C. PACHYPUS FOUND
Glen of the Downs	O 2611	23.2.80	1.3.80
Glen of the Downs	O 2611	13.3.80	26.3.80
Knocksink Wood	O 215180	25.5.80	3.6.80
Glen of the Downs	O 2611	10.9.80	23.9.80
Lough Tay	O 165070	15.3.81	29.3.81
Glenmalure	T 1091	17.3.81	11.4.81
Knocksink Wood	O 215180	14.3.82	26.3.82
Near Rathdrum	T 1890	27.3.82	15.4.82
Ballinacor Wood	T 1488	27.3.82	12.5.82
Vale of Clara	T 1892	29.1.83	28.2.83
Greystones	O 2814	1.4.84	26.4.84
Grange North	O 3002	11.4.85	30.4.85

The interesting point is that although oak cultures have been made from 24 of the 40 Irish vicecounties, C. pachypus has appeared exclusively on bark taken from an area in Eastern County Wicklow. An attempt has been made to define the limits of its distribution by preparing cultures from the extremities of the area, but this is of course influenced by the irregular distribution of the oaks themselves. No suitable examples could be found in South County Dublin, and none at all in the highest parts of the mountains. The sea appears to form the eastern limit, but oaks of a suitable type do continue in the South, and it is hard to see why C. pachypus does not persist there.

The map shows the location of the above positive results (marked X) together with a number of points marked O where unsuccessful oak cultures were taken (Fig. 1). A few cultures within the positive area failed to produce C. pachypus: three from the Glen of the Downs (7.1.81, 5.3.81 and 10.4.85), one near Laragh (24.1.81), one from Lough Tay (15.3.81) and one from Delgany (23.4.84). All the trees involved were large, and there seemed to be no correlation with the species of epiphytes on the bark.

In England C. pachypus has been recorded from South Wiltshire, East Sussex, East and West Kent (Ing, 1982). It has also been found in Scotland, France, India and Dominica (Ing, pers. comm.).

Attempts were made to germinate C. pachypus spores in water used to soak bark from Grange North (positive) and Howth (negative) following the example of McManus (1961) with C. debaryanum. Both resulted in the appearance of swarmers: it is therefore conjectured that the factors restricting distribution are geographical rather than chemical.

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FIGURE 1: The distribution of Clastoderma pachypus Nann.-Brem. in Ireland. C. pachypus was present at sites marked X, but was not isolated at sites marked O.

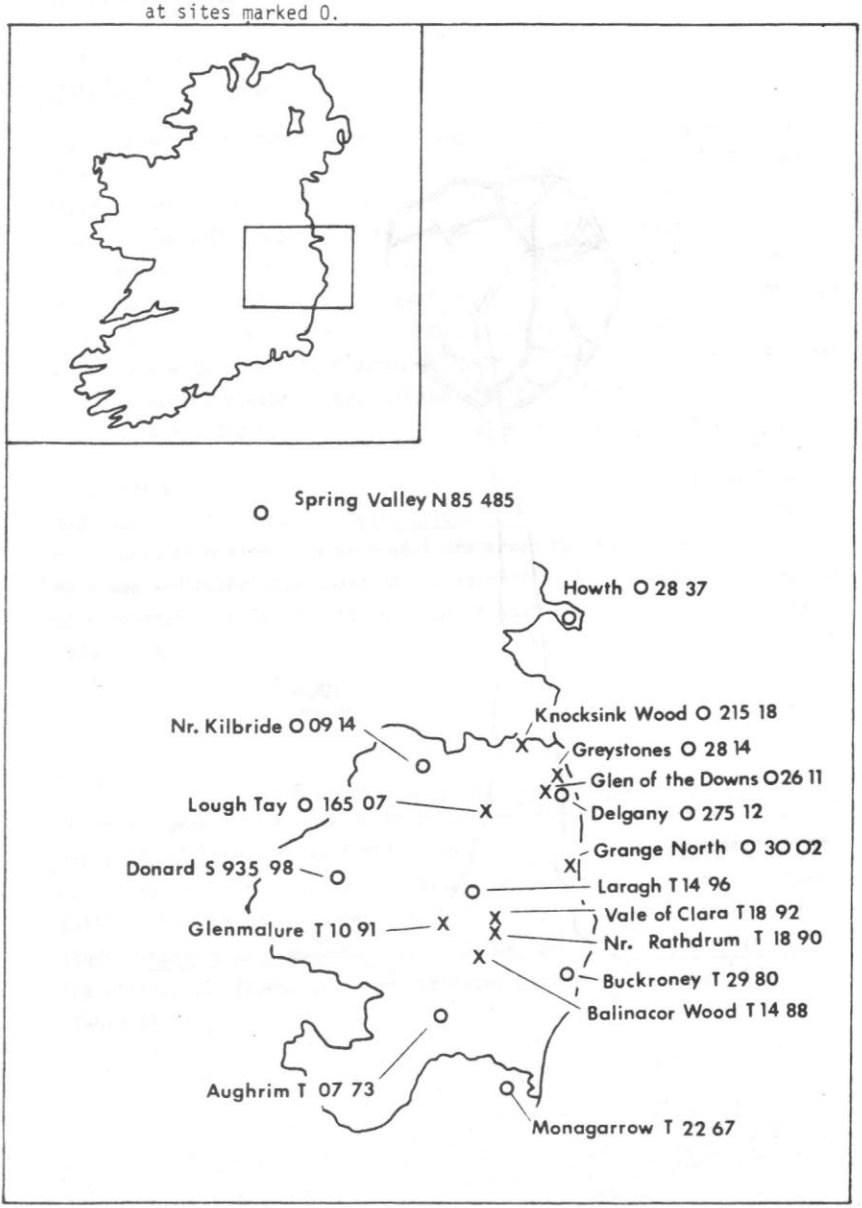

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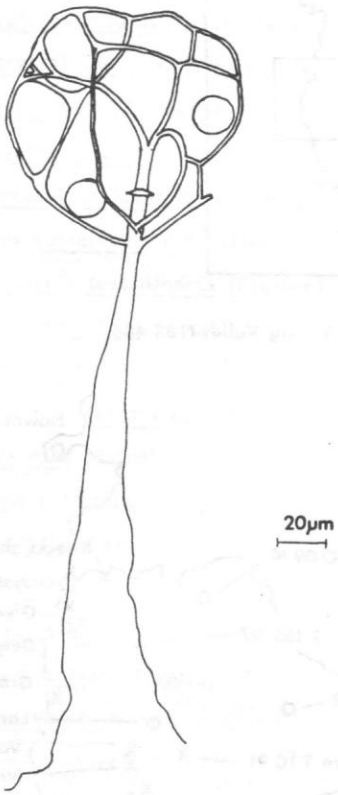
FIGURE 2: Sporangium of Clastoderma pachypus Nann.-Brem.



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OBSERVATIONS ON THE CORIXIDAE (INSECTA: HEMIPTERA) OF THE KILLARNEY LAKES AND DISTRICT.

J. P. O'Connor, M. F. O'Grady and J. J. Bracken

Introduction

From October 1971 to September 1972, corixids were collected (by O'Grady and Bracken) as part of an eutrophication study of the Killarney Lakes. Although, the sampling techniques were not specifically designed to obtain Corixidae, many specimens were taken. The group had been previously collected in the Killarney area by several entomologists including E. F. Bullock and J. N. Halbert. Much of their material is preserved in the National Museum and it was decided therefore that it would be worthwhile to produce a list of species for the area utilizing all the available data. O'Connor reidentified all the relevant specimens in the National Collections and also collected additional qualitative samples in the Killarney Lakes during November 1977. Since then, Kirby (1983) recorded several species in August and September 1981. The present paper evaluates the older and the more recent records to provide a comprehensive list of the Corixidae of the Killarney area along with observations on their occurrence in the Killarney Lakes.

Sampling sites and methodology

The sampling sites and collection methods used in the eutrophication study are outlined in O'Connor and Wise (1984) and only brief descriptions are presented here (Table 1). The November 1977 stations are also included. With time, the locations of many of Bullock's sites have become uncertain. In 1977, J. P. and M. A. O'Connor visited the area and with the assistance of Messrs. P. Cremin, M. Lucey and P. O'Leary, managed to find many of these sites. Since they are of importance to workers in other groups, their locations are presented (Table 2). From an examination of Bullock's data labels, it is evident that two places were of particular interest to him. One is a ballast pit on the outskirts of Killarney town. It lies between a public road and the Dublin - Killarney railway line. When visited in 1977,

it was partially flooded and many drowned terrestrial organisms were evident. The site is undoubtedly subjected to alternating conditions of drought and flood. The second site, Ardagh Lough or Lucey's Lake, is a small lake near Muckross. It has a small reedbed of Phragmites. Ardagh Bog lies nearby.

Results and discussion

The results of the eutrophication study and the November 1977 collections are presented (Table 3). Sigara scotti (Fieber) predominated in the Upper Lake but its importance decreased with increasing trophic status. Exceptions were Brickeen Bridge (Middle Lake) and Bog Bay (Lower Lake). In both these areas, the substratum contained large amounts of organic matter. S. distincta (Fieber) was the dominant species at two Lower Lake stations viz. Victoria Bay and Bog Bay. S. dorsalis (Leach) was found in all three lakes but with the exception of Coleen Bawn, it was not common in either the Upper or Middle Lakes. In the Lower Lake, by contrast, it was present at every station and often in considerable numbers. It was frequently associated with exposed conditions. Micronecta poweri (Douglas and Scott) was frequently collected but in small numbers. Many specimens may have escaped because of their small size. Other species were infrequently recorded but their occurrence is of interest. A few specimens of S. falleni (Fieber) and one individual of S. nigrolineata (Fieber) were taken in the main sampling programme. The former species was obtained in both the Upper and Lower Lakes, the latter in the Middle Lake. Another two species, Callicorixa praeusta (Fieber) and Arctocorisa germari (Fieber) were practically confined to Victoria Bay, on the Lower Lake, where the most varied and numerous corixid fauna was encountered. Here the substratum consists of sand and during the summer, an excessive growth of littoral algae, as a result of nutrient enrichment, was observed. Kirby (1983) took C. praeusta in the nearby Ross Bay. A comparatively diverse fauna also inhabited Bog Bay but the remaining Lower Lake sampling sites only yielded one to three species because of their exposed nature. These species were often only sparsely represented. The poorest corixid area of the three lakes was Brickeen Bridge (Station 1) on the Middle Lake with only one specimen of S. nigrolineata. It occurred on a substratum of

large angular rock fragments.

The 1977 samples from flooded areas of the three lakes provided additional information. Because of these collections, S. dorsalis was discovered in the Upper Lake and it was also taken with both S. distincta and S. scotti in the Middle Lake. Suprisingly, S. falleni was found to be abundant over flooded grass beside the golf course on the Lower Lake.

Altogether eight species were obtained in the three lakes. By contrast, the Bullock Collection yielded six species. Of these, neither Cymatia bonsdorffi (Sahlberg, C.) nor Hespercorixa sahlbergi (Fieber) were taken during the eutrophication study. This difference in results is to be expected. It is well known that corixids migrate (e.g. Walton, 1943; Leston and Gardner, 1953; Macan, 1962). This aspect of corixid behaviour can lead to important population changes even over a short period of time (Macan, 1976). Both C. bonsdorffi and H. sahlbergi nave been recorded elsewhere in the area (Table 4) and it is possible that Bullock captured specimens which were temporarily visiting the lakes.

Savage and Pratt (1976) reviewed the distribution of some species of Corixidae in lakes. They suggested that S. distincta is associated with the end of the oligotrophic series. S. distincta, when found, usually formed a small proportion of the total lake populations (0.4 - 9.8%). Only Windemere and Esthwaite had fair numbers, 27 - 32% respectively. In Killarney, its importance increased with increasing trophic level and at two of the Lower Lake stations, it reached 53.6 - 60.8%. The occurrence and abundance of S. scotti in the Upper Lake reflects the pattern observed in published data (Macan, 1954b). It is of note that no specimens of S. fallenoidea (Hungerford) were taken during the present study. This corixid was first reported in Ireland from Lough Derg,Co. Galway (Walton, 1936). It has not been recorded in Great Britain. Macan and Lund (1954) found individuals in several Irish lakes with a calcium content ranging from 25.6 - 51.5 p.p.m. By contrast, the Killarney Lakes fall within the range 1.65 - 7.0 p.p.m. (Bracken et al., unpublished data). O'Connor and Norton (1978) suggest that S. fallenoidea may be a species of calcareous waters only. The calcium concentrations of the Killarney Lakes may be insufficient for its survival.

A total of twenty-one species are now definitely known from the Killarney district (Table 4). One species, S. striata (L.), recorded by Halbert (1935) has been deleted from the list due to misidentification. All the specimens named as S. striata have proved to be S. dorsalis. The latter was only recognised after the publication of Halbert's work (Macan, 1954a). S. striata has a local distribution in Great Britain (Leston, 1956; Macan, 1965).

Although S. limitata (Fieber), S. venusta (Douglas and Scott), Hesperocorixa moesta (Fieber) and Corixa affinis Leach have been recorded from the area (Halbert, 1935; Pearse and Walton, 1939), no specimens were preserved in the Museum or taken in recent collections. Since only species whose identification could be confirmed are included, records of the above taxa have been excluded from the list. The Museum collections demonstrate that S. semistriata (Fieber), S. nigrolineata and S. fossarum (Leach) were sometimes misidentified. Only verifiable records have therefore been included. Callicorixa wollastoni Douglas and Scott was reported from two localities by Halbert (1935) but a re-examination of the original material revealed that all but three specimens had been misdetermined. Two cannot be accurately named but the identity of the third specimen has been confirmed by W. R. Dolling. It had been taken in the Ballast Pit on 10 July 1929. Kirby (1983) has shown that the species is common in bog pools and loughs up to 2600 feet in the adjacent mountainous areas. The Ballast Pit individual was probably a vagrant from one of these sites.

It is evident from the available data that some species are widely distributed in the district (Table 4). Others were of limited occurrence and typical examples are Corixa dentipes (Thomson), C. panzeri (Fieber), A. germari and Glaenocorisa propinqua (Fieber). McCarthy (1975) was unable to find specimens of the last named species in its original locality because of drastic habitat change but Kirby (1983) has discovered two new sites where it is very common.

With the exception of Arctocorisa carinata (Sahlberg), the Killarney species list is similar to that of the English Lake District (Macan, 1938, 1965). Moreover, A. carinata would not be expected to occur in the former area. It is a circumboreal species which survives only in upland areas and,

if ever present in Ireland, has probably been wiped out (Leston, 1958). Macan (op. cit.) also records S. venusta and S. limitata but the status of these species in the Killarney area is unknown.

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TABLE 1: DESCRIPTIONS OF THE SAMPLING STATIONS ON THE KILLARNEY LAKES. Q refers to those of November 1977.

WATER-BODY	STATION NO.	STATION DESCRIPTION
Upper Lake Oligohumic/ Oligotrophic	1: Stag Is. Bay (V 893817)	A sheltered bay. Substrate of peat and fine organic material. Marginal growth of *Juncus bulbosus* L. and *Carex* spp.
	2: South West Shore (V 918819)	A moderately exposed boggy shore. Substrate of peat and organic litter with occasional stones. Marginal stand of *Carex*.
	Q (V 935839)	A sheltered inlet containing flooded grasses and other marginal vegetation.
Middle Lake (Muckross Lake) Oligotrophic	1: Brickeen Bridge (V 937858)	A moderately exposed rocky headland with a steep gradient. Substrate of large angular rock fragments.
	2: Brickeen Bridge (V 937858)	A sheltered inlet with a growth of *Phragmites australis* (Cav.) Steud. Stony substrate overlain by silt and organic litter.
	3: Coleen Bawn (V 950859)	An exposed shore comprising a flat area of sand interspersed by large bare stones and a narrow marginal belt of wave-washed stones.
	4: Dundag Bay (V 965858)	A comparatively large bay, partially sheltered. Substrate predominantly sand but *P. australis*, *Littorella uniflora* (L.) Aschers and stones also present. Received discharges of untreated sewage.
	Q (V 965853)	A sheltered inlet containing flooded grasses and other marginal vegetation. Situated near station 4.

TABLE 1 (Continued)

WATER-BODY	STATION NO.	STATION DESCRIPTION
Lower Lake (Lough Leane) Mesotrophic with imposed eutrophic tendencies	1: Laune Exit Shore (V 899908)	A moderately exposed rocky shore in proximity to the River Laune outflow. Substrate of stones interspersed with large boulders. L. uniflora well established.
	2: Fossa Shore (V 915916)	An exposed rocky shore. Substrate of rock "rubble". In summer, excessive growths of epilithic algae caused by inshore nutrient loading.
	3: Mahoney's Point (V 928908)	Exposed rocky headland. Substrate of coarse "rubble" and large boulders. In summer, heavy growth of periphyton due to nutrient enrichment.
	4: Victoria Bay (V 946900)	A somewhat sheltered bay with a substrate predominantly of sand. Sparse stand of P. australis. In summer, there is also an excessive growth of littoral algae.
	5: Castlelough Bay (V 975880)	At the exposed end of a bay. The substrate is sand. There is a narrow stony margin.
	6: Bog Bay (V 963867)	A small deeply indented area with P.. australis and Nymphaea alba L. Substrate of fine organic litter and debris derived from decomposing plants. Due to mechanical excavation in July 1972,samples were taken subsequently in an adjacent reedbed.
	Q (V 929913)	A sheltered inlet with flooded grasses beside the golf course and station 3.

TABLE 2. THE LOCATIONS OF BULLOCK'S SAMPLING SITES.

Aghadoe:	the Lower Lake near Aghadoe House (V 917916).
Ardagh Lough:	a small lake near the convent at Muckross (V 984879).
Ardagh Bog:	beside Ardagh Lough (V 985885).
Ballast Pit:	on the outskirts of Killarney town, near the G.A.A. stadium (V 968916).
Bog Pond:	this is probably another name for the small pond at Derrycunihy (see below).
Bunror (Bunrower):	a small bay on the Lower Lake, near the race course (V 955885).
Cahirnane:	?Cahernane House beside the River Flesk (V 963888).
Derrycunihy:	a small pond near Galways Bridge (V 904804).
Flesk:	probably the River Flesk near Killarney (V 966894).
Gap:	The Gap of Dunloe which contains several lakes, streams etc. (V 878862).
Guitane:	a large lake near Killarney (W 030846).
Guitane Bog:	there are several areas of bog near Lough Guitane.
Leane/ L. Side/ L. Shore:	these probably refer to the Lower Lake near Muckross (V 975877).
L. Range:	the Long Range between the Upper and Middle Lakes (V 935845).
Lough Looscaunagh:	a lake near the Upper Lake (V 889795).
Muckross:	Muckross (Middle) Lake (V954852).
Mangerton:	there are several small lakes on Mangerton Mountain (V 982813).
Minish:	this locality is situated beside the River Flesk near a ford (W 005878).

TABLE 3. RELATIVE ABUNDANCE OF CORIXIDAE IN THE LITTORAL ZONE OF THE KILLARNEY LAKES.

The numbers for the eutrophication study represent the annual totals taken at monthly intervals between October 1971 and September 1972. They are derived from one 5 minute sample collected with a rake and 25 cm net (mesh: 10 per cm) at each station each month. Q refers to the qualitative stations of November 1977.

SPECIES	UPPER LAKE			MIDDLE LAKE					LOWER LAKE						
	1	2	Q	1	2	3	4	Q	1	2	3	4	5	6	Q
Sigara scotti	329	688	(100)	0	86	0	1	(419)	0	0	0	3	5	176	(3)
Sigara distincta	55	21	(0)	0	34	31	0	(34)	0	3	0	439	7	379	(3)
Sigara dorsalis	0	0	(13)	0	0	38	2	(29)	21	141	5	346	2	66	(21)
Micronecta poweri	3	0	(0)	0	2	0	7	(0)	0	0	0	12	0	1	(0)
Sigara falleni	0	3	(0)	0	0	0	0	(0)	0	0	0	0	0	1	(64)
Callicorixa praeusta	0	0	(0)	0	0	0	0	(0)	0	0	1	10	0	0	(0)
Arctocorisa germari	0	0	(0)	0	0	0	0	(0)	0	0	0	8	0	0	(1)
Sigara nigrolineata	0	0	(0)	1	0	0	0	(0)	0	0	0	0	0	0	(0)

TABLE 4. THE CORIXIDAE OF THE KILLARNEY DISTRICT.

(B.) - Bullock Collection (1916 - 1948); (H.) - Halbert Collection (1898 - 1927); (G.C.) - Museum's General Collection; (E.S.) - Eutrophication Study (November 1977 samples included); (K.) - Kirby (1983).

Arctocorisa germari (Fieber): Ballast Pit (B.); Lower Lake: Victoria Bay, ♀ (V 929913) (E.S.); Pools in gravel pit at Killarney (Pearce and Walton, 1939); Escabehey L. (V 7378), Knockbrack (V 9578) (K.).

Callicorixa praeusta (Fieber); Ardagh, Ballast Pit, Cahirnane, Guitane Bog, Lake Shore/Lake Side, Mangerton (B.); Lower Lake: O'Mahony's Point, Victoria Bay (E.S.); Lower Lake: Ross Bay (V 9488) (K.).

C. wollastoni (Douglas and Scott): Ballast Pit (1 ♀) (B.); Killarney: Pools in gravel pit (1 ♂) (Pearce and Walton, 1939); common in bog pools and loughs up to 2600' (V 9880, 7378, 8184, 8376, 8476, 8577, 9578, 9579) (K.).

Corixa dentipes (Thomson): Bog Pond, Lough Looscaunagh (B.) (Bullock, 1928).

C. panzeri (Fieber): Ballast Pit (B.).

C. punctata (Illinger): Ardagh, Ballast Pit, Guitane Bog (B.); Killarney: Pools in gravel pit (Pearce and Walton, 1939).

Cymatia bonsdorffi (Sahlberg, C.): Ardagh, Ballast Pit, Bog Pond, Cahirnane, Caragh, Guitane Bog, Lake Shore/Lake Side, Muckross (B.); Killarney: Pools in gravel pit (Pearce and Walton, 1939).

Glaenocorisa propinqua (Fieber): Bog Pond (B.); Escabehey L. (V 7378) 800', L. Keal (V 9578) 1800' (K.)

Hesperocorixa castanea (Thomson): Killarney, Kenmare (H.); Killarney: Pools in gravel pit (Pearce and Walton, 1939).

H. linnei (Fieber): Ardagh, Ardagh Bog, Ballast Pit (B.).

H. sahlbergi (Fieber): Aghadoe, Ardagh, Ballast Pit, Bog Pond, Guitane, Guitane Bog, Killarney, Leane, Muckross (B.).

Micronecta poweri (Douglas and Scott): Cahirnane, Derrycunihy, Flesk, The Gap (of Dunloe), L. Side (B.); Upper Lake: Stag Is. Bay, Middle Lake: Brickeen Bridge, Dundag Bay, Lower Lake: Victoria Bay, Bog Bay (E.S.).

Sigara concinna (Fieber): Ardagh, Ballast Pit (B.).

TABLE 4 (Continued)

S. distincta (Fieber): Killarney, Lough Looscaunagh (H.); Upper Lake: Stag Is. Bay, South West Shore, Middle Lake: Brickeen Bridge, Coleen Bawn, Q (V 965853), Lower Lake: Fossa Shore, Victoria Bay, Castlelough Bay, Bog Bay, Q (V 929913), R. Laune (V 893911), R. Flesk (W 036876) (E.S.); Lower Lake: Ross Bay (V 9488) (K.).

S. dorsalis (Leach): Ballast Pit, Derrycunihy, Lake Shore/Lake Side, Laune, Long Range, Lough Guitane, Muckross (B.); Upper Lake: Q (V 935839), Middle Lake: Coleen Bawn, Dundag Bay, Q (V 965853), Lower Lake: Laune Exit, Fossa Shore, O'Mahony's Point, Victoria Bay, Castlelough Bay, Bog Bay, R. Laune (V 893911), Q (V 929913) (E.S.); Upper Lake (V 9282), Middle Lake (V 9685), Cloon L. (V 7078), Devil's Bit (V 9383) (K.)

S. falleni (Fieber): Upper Lake: South West Shore, Lower Lake: Bog Bay, Q(V 929913)(E.S.); Ballast Pit (Halbert, 1935).

S. fossarum (Leach): Ballast Pit (B.); Killarney (H.); Killarney (G.C.).

S. lateralis (Leach): Ardagh, Ballast Pit (B.); Minish (H.); Killarney: Pools in gravel pit (1 ♂) (Pearce and Walton, 1939).

S. nigrolineata (Fieber): Ballast Pit (B.); Ballast Pit, Kenmare (H.); Middle Lake: Brickeen Bridge (E.S.); Killarney: Pools in gravel pit (Pearce and Walton, 1939); Most commonly in small peaty pools at high altitude but not uncommonly in the higher loughs: V 9880, 9781, 8184, 9583, 8476, 9478, 9578 up to 2400' (K.).

S. scotti (Fieber): Lake Shore (B.); Kenmare, Killarney, Lake Side (H.); Upper Lake: Stag Is. Bay, South West Shore, Q (V 935839), Middle Lake: Brickeen Bridge, Dundag Bay, Q (V 965853), Lower Lake: Victoria Bay, Castlelough Bay, Bog Bay, Q (V 929913), R. Laune (V 893911) (E.S.); L. Crincaum (Halbert, 1935); Killarney: Pools in gravel pit (Pearce and Walton, 1939); V 9282, 9880, 7378, 7078, 8577, 9586, 9478, 9579, 9383 in standing water of all types up to 2400' (K.).

S. semistriata (Fieber): Kenmare (G.C.); Killarney: Pools in gravel pit (2♂♂) (Pearce and Walton, 1939).

Bull. Ir. biogeog. Soc. No. 9.

RECENT RECORDS FOR RARE CORK PLANTS.

Tony O'Mahony

Field-work by the author within the county in recent years has turned up a number of new stations for rare Cork plants. Some of these finds are detailed here, together with a few new vice-county records. The area covered includes the vice-counties of West Cork (H3), Mid Cork (H4) and East Cork (H5).

In the following list, nomenclature and order follow Clapham et al. (1981). In the majority of cases, the present species records are the only recent county records. *An asterisk denotes alien status, while the contraction (NVCR) = New-Vice County Record. Unless otherwise stated, all records are the author's.

Ranunculus lingua: H5, R 5811 (NVCR). Frequent in Kilcoman marsh (Wildfowl Refuge) near Buttevant: July 1969 - 1985. This handsome plant was originally found here in 1969 by a group from University College Cork, who were undertaking a preliminary botanical survey of the marsh for the owner, the late Mr. Richard Ridgway. In 1972 the species was again recorded by M. Scannell and D. Synnott (DBN), and in subsequent years by the writer.

Elsewhere in the county Greater Spearwort has only definitely been recorded from the stream in the grounds of Blarney Castle, Mid Cork, where apparently it has not been seen since 1855.

Crambe maritima: H3, W 5141. On the boulder beach at Broad Strand, Courtmacsherry: Mrs. M. Bare, 1970. Two plants seen in flower here by the writer and D. A. Webb in May 1971, had increased to eight plants by July 1982 (T. O'Mahony).

H3, W 1527. On the boulder beach at Sweeney's Cove, Tow Head: Mrs. M. C. D. Bridges, June 1976.

H5, W 9865. A single plant on the boulder beach near Ballycotton Village: July 1981. Seen here again in August 1985 by R. T. Mills and Patrick Smiddy.

The beautiful Sea Kale has shown a welcome increase in frequency around the Irish coast in recent years, in common with a few other maritime species such as Leymus arenarius and Atriplex laciniata.

Raphanus maritimus: H4, W 7757, (NVCR). In small quantity on the sand-spit at the mount of Ringabella Creek, Fountainstown, Cork Harbour: August 1985. Sea Radish is locally frequent on the coasts of West Cork and East Cork (as elsewhere on the Irish coast), but few suitable habitats are available for it in Mid Cork.

Note: In many floras R. maritimus is treated as a subspecies of R. raphanistrum L., as the morphological differences between the two are relatively slight, viz: lower leaves with contiguous rather than distant lobes; siliculae 5-8 mm wide, not 4-6 mm wide, their segments as broad as long, not longer than broad; seeds 1-5, not 3-8.

Nevertheless, throughout their European range both taxa have quite different ecological requirements, R. raphanistrum being typically a weed of light, acid, arable land, while R. maritimus is typically confined to base-rich sandy and rocky sea-shores. Moreover, in their account of the genus Raphanus Harberd and Kay (1975) state that artificial F_1 hybrids between the two were found to be 50% - 60% pollen and seed-fertile under good conditions, but less fertile under stress, when they tended to produce abortive flowers.

In the wild, apparent F_1 hybrids have been seen with parents in north-west France. As both species are rather strongly self-incompatible, hybridization could well occur in coastal areas where acid arable land adjoins a beach area, thus bringing both together.

*Sisymbrium orientale: H4, W 67. Occasional in waste sites in Cork city (eg. Grattan Street, area, Fr. Matthew Quay, near Blackpool church, etc.), and apparently increasing in numbers in recent years. All records 1966 - 1985.

Spergularia rubra: H4, W 4571. Abundant with other annuals on the bare, gravelly right bank of the River Lee immediately below Rooves bridge, Coachford: July 1974 - 1985.

H4, W 5172. Occasional on the gravelly left bank of the River Lee at Magooly, Lower Dripsey: August 1984 - 1985. Red Sand Spurrey is apparently spreading very slowly along the course of the River Lee, where the bare, acid, competition-free river gravels provide an ideal habitat for many annual plant species. A rare Irish plant, that has not been seen in either its West- or East Cork stations in many years.

Chenopodium rubrum: H5, R 5811. About the lough in Kilcolman marsh. Originally found here in c. 1870 by the Rev. Thomas Allin. Found to be common about the lough during dry summers in the period July 1972 - 1984: M. Ridgway, T. O'Mahony. Recorded also from some boggy coastal pools on Sherkin and Calf Islands, West Cork (Polunin, 1950). There are no recent Mid Cork records for the species. Red Goosefoot has very few native inland Irish stations, the nearest station to Kilcolman being at Lough Gur, Co. Limerick (H8).

Atriplex littoralis: H5, W 96. Common on the banks of the saltmarsh channels at Ardnahinch, Ballycotton Bay: and frequent on the beach westwards to Ballycotton Village: July 1981 - 1984. Grass-leaved Orache has not been seen for many years in its very few other Mid Cork and East Cork stations. A rare and very local species on the Irish coast.

Trifolium fragiferum: H3, W 360331. Frequent in one damp, sandy, calcareous pasture field facing Red Strand, Dirk Bay, near Clonakilty: August 1983. The only present-known Cork station for this predominantly coastal Irish clover. Strawberry Clover was originally found here by Mrs.G. E. Lucas in 1933 (Praeger, 1934). The Cork plant is referable to subspecies fragiferum, which is probably the only subspecies present in Ireland.

The common English name alludes to the downy, swollen fruiting heads which, however, are whitish, not red, in colour.

Rumex maritimus: H4, R 5811. Kilcolman marsh (Wildfowl Refuge) near Buttevant. Found about the lough here in c. 1870, by the Rev. T. Allin, where it has put in sporadic (and often spectacular) appearances ever since, during very dry summers. Abundant here during the period July 1972 - 1984. The Golden Dock is apparently confined to the lough in Kilcolman marsh - its only Cork station. A very rare Irish dock, whose nearest station is at Lough Gur, Co. Limerick.

Echium vulgare: H3, W 4038. In small quantity on the calcareous sand-dunes of Inchydoney Island, Clonakilty: July 1971/1980. Apparently confined to the area of dunes across channel from Lower Ring. The only known permanent Cork station for Viper's Bugloss, a species in Ireland almost confined to the east and north-east coasts, though it puts in casual appearances elsewhere.

*Misopates orontium: H4, W 5172. Twenty plants found scattered along the upper reaches of the bare, gravelly left bank of the River Lee near Magooly, Lower Dripsey: August 1984. The Lesser Snapdragon is a rare annual of arable land and waste ground throughout Co. Cork. Very rare elsewhere in Ireland.

*Kickxia elatine: H3, W 6447. Twelve plants on a bare hedgebank, near the postbox at Sandy Cove, Kinsale: July 1980.

H4, W 792637. Occasional in cornfields north of Lough More, near Ringaskiddy, Cork Harbour: August 1972/1978.

H4, W 807604. A few plants at the side of the main road between Poulnacalee Bay and the Helm Hotel (Weaver's Point); Crosshaven, Cork Harbour: August 1985.

H4, W 5172. Frequent over a short stretch of the bare, gravelly left bank of the River Lee, near Magooly, Lower Dripsey: August 1985. Growing here with Spergularia rubra, Stachys annua, etc.

Short-leaved Fluellen is an annual plant of occasional occurrence in corn-fields and waste ground in Co. Cork. Very rare elsewhere in Ireland.

Orobanche rapum-genistae: H4, W 7961. A few plants in a mixed Ulex europaeus/Cytisus scoparius thicket in Currabinny Forest Park opposite Crosshaven, Cork Harbour: Patrick O'Hara, 1978. Originally found here by R. W. Scully in 1898, where it has put in sporadic appearances ever since.

H5, W 682804. Eighteen plants in a mixed U. europaeus/C. scoparius thicket, in permanent pasture on the right bank of the Glashaboy River, immediately above Dunbullogue bridge: June 1975. Unusual in that the inflorescences were somewhat pendulous. Station destroyed in July 1976. Apparently the first East Cork record in c. 130 years.

Greater Broomrape appears not to have been recorded from West Cork in the last thirty years, although in the 1870s it was reported as 'not infrequent' on the River Bandon between Dunmanway and Bandon. It would seem that the last H3 record was that of O'Donovan and O'Regan (1952) from Tra-na-mbo, near Lough Ine, in 1951.

During the period 1900 - 1970, Greater Broomrape greatly declined in both Ireland and Britain, for reasons unknown. Yet since 1975 the species has been re-recorded from Mid Cork, East Cork, Wicklow and South Tipperary, which suggests that it is making a comeback.

Salvia verbenaca: H3, W 360332. Frequent on the seaward side of a calcareous sand-dune, facing Red Strand, Dirk Bay, near Clonakilty: August 1970/1983. Seemingly originally found here by Rev. T. Allin in c. 1870. Site under threat from a nearby Caravan Park. Wild Dodder, Cuscuta epithymum occurs here commonly with the Wild Clary, in one of its few Cork stations.

H5, X 1076. Still frequent on the seaward side of Clay Castle Bank, Youghal: July 1968/1983. Originally found here by James Drummond in c. 1810. No other extant East- or West Cork stations are known for this nationally rare species.

Chamaemelum nobile: H4, W 455713. Common over a short stretch of gravel on the right bank of the River Lee, immediately above Rooves bridge, near Coachford: August 1974 - 1985.

H4, W 366718. Frequent in one damp gravelly meadow on the left bank of the River Lee Reservoir (Formerly course of the River Sullane), near Ashton, Macroom: August 1984 - 1985. These are the only known extant stations for Wild Chamomile in either Mid Cork or East Cork, though the species formerly occurred more frequently in both vice-counties. West Cork is one of the major strongholds for this species in Ireland.

*Picris echioides: H4, W 7957. A few plants on waste ground near Ringabella Beach, Cork Harbour: Patrick Beamish, July 1978. Casuals.

H5, W 993663. About one hundred, very large plants on a field bank facing the beach at Ardnahinch, Ballycotton Bay: July 1981 - 1984. Bristly Ox-Tongue is a very rare plant in Ireland, and all of the Cork records (save that from Ardnahinch) have been of casual plants only.

Butomus umbellatus: H5, W 819988. Frequent by the mill-stream at Inchfield, Fermoy, and on the right bank of tne River Blackwater immediately below this station: July 1980.

H5, R 839002. A few plants by the confluence of the rivers Funchion and Blackwater, below Fermoy: August 1978. All of the old Cork (H4 - H5) stations for the Flowering Rush need re-finding. Recently this beautiful plant has been reported from marshy ground near the River Ilen, Skibbereen (H3), but the record needs confirmation.

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NOTES ON SOME CRUSTACEANS FROM GALWAY BAY.

J. M. C. Holmes

Introduction

On 11 April 1983, following an Irish Biogeographical Society meeting in Galway, some collecting was done by underwater light trap at Spiddal, Co. Galway (M 125218). The trap was laid at 8.00 p.m. on the evening of 10 April in 5 m depth of water on sand near weed about 50 m offshore from Spiddal pier. The trap was raised at 9.30 a.m. on the morning of 11 April, and the catch was preserved in formalin and identified later. Although only a single sample, a number of interesting crustaceans were encountered.

Results

A list of the Crustacea taken in the trap is presented (Table 1). Many animals were unsexable, either because they were damaged in some way and the sex could not be determined, or more usually because they were juvenile, for example, the cypris larvae of barnacles. Animals were counted up to 1000. Beyond that they are expressed as 1000+. It was estimated that there must have been about 10,000 specimens of the copepod Pseudocalanus elongatus Boeck, so a random sample was sexed and the ratio is expressed as a proportion rather than in absolute numbers.

A selection of the material has been deposited in the National Museum of Ireland (N.M.I. 99.1983).

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TABLE 1: CRUSTACEA COLLECTED BY UNDERWATER LIGHT TRAP, SPIDDAL, CO. GALWAY.

Species	Sex ♂♂	♀♀	Unknown	Total
CLADOCERA				
Evadne nordmanni Lovén		1	8	9
Podon leuckarti G.O.Sars		1		1
MYODOCOPIDA				
Parasterope muelleri (Skogsberg)	1	1		2
CALANOIDA				
Acartia clausi Giesbrecht	98	166	4	268
Acartia discaudata (Giesbrecht)	74	13		87
Centropages hamatus (Lilljeborg)	230	155	24	409
Isias clavipes Boeck	251	510	67	828
Parapontella brevicornis (Lubbock)	2			2
Anomalocera patersoni Templeton		1		1
Eurytemora affinis (Poppe)	21	1		22
Eurytemora velox (Lilljeborg)	2	2		4
Temora longicornis (O.F.Müller)	376	31		407
Pseudocalanus elongatus Boeck	32%	68%		1000+
Calanus helgolandicus (Claus)	187	797	83	1000+
Paracalanus parvus (Claus)	3			3
HARPACTICOIDA				
Harpacticus chelifer (O.F.Müller)	1	12		13
Harpacticus flexus Brady & Robertson		4		4
Harpacticus uniremis Krøyer	177	188		365
Zaus spinatus Goodsir	30	80		110
Alteutha sarsi Monod	2	25		27
Alteutha interrupta (Goodsir)	12	9		21
Alteutha oblonga (Goodsir)	1	8		9
Tegastes clausi G.O.Sars		1		1
Sacodiscus littoralis (G.O.Sars)	2	4	1	7
Scutellidium longicauda (Philippi)	3	4		7
Tisbe furcata (Baird)	2	38	10	50
Amonardia normani (Brady)		1		1
Paramphiascopsis longirostris (Claus)	1	1		2

TABLE 1 (Continued)

Species	♂♂	♀♀	Sex Unknown	Total
Dactylopodia vulgaris (G.O.Sars)	217	220		437
Parathalestris clausi (Norman)	89	90		179
Parathalestris harpacticoides (Claus)		1		1
Parathalestris hibernica (Brady & Robertson)	5	26		31
Parathalestris intermedia Gurney	2	3		5
Parathalestris irelandica Roe	1	2		3
Phyllothalestris mysis (Claus)		2		2
Rhynchothalestris rufocincta (Brady)		2		2
Thalestris longimana Claus	95	127	2	224
SIPHONOSTOMATOIDA				
Dermatomyzon nigripes (Brady & Robertson)	1			1
CYCLOPOIDA				
Cyclopina gracilis Claus		1		1
Mychophilus roseus Hesse	1			1
Notodelphys sp.	12			12
THORACICA				
Verruca stroemia (O.F.Müller) cypris			1000+	1000+
Balanus balanoides (L.) cypris			1000+	1000+
Balanus crenatus Bruguière cypris			1000+	1000+
CUMACEA				
Bodotria scorpioides (Montagu)	128	7	10	145
Cumopsis goodsiri (van Beneden)	89	5	66	162
Cumella pygmaea G.O.Sars	23			23
Nannastacus unguiculatus (Bate)	14			14
Pseudocuma longicornis (Bate)		2	15	17
ISOPODA				
Idotea emarginata (Fabricius)			1	1
Idotea pelagica Leach			28	28
Epicaridean larvae			3	3

TABLE 1 (Continued)

Species	♂♂	♀♀	Sex Unknown	Total
AMPHIPODA				
Orchomene nana (Krøyer)	1	4		5
Tryphosella sarsi Bonnier	1	1		2
Bathyporeia elegans Watkin	126	12		137
Bathyporeia guilliamsoniana (Bate)	1			1
Bathyporeia nana Toulmond	11			11
Bathyporeia pelagica (Bate)		6		6
Apherusa bispinosa (Bate)	12	14	10	36
Apherusa jurinei (H.Milne Edwards)			9	9
Perioculodes longimanus (Bate & Westwood)	5			5
Pontocrates altamarinus (Bate & Westwood)		1	36	37
Pontocrates arenarius (Bate)	32	3		35
Hyale perieri (Lucas)		2		2
Atylus falcatus Metzger	17	1	81	99
Atylus guttatus (Costa)	3	4	8	15
Atylus swammerdami (H.Milne Edwards)	31	26	100	157
Atylus vedlomensis (Bate & Westwood)	2			2
Dexamine spinosa (Montagu)	1		1	2
Dexamine thea Boeck		25	123	148
Guernea coalita (Norman)		1		1
Tritaeta gibbosa (Bate)	4			4
Ampelisca spinipes Boeck	2			2
Megaluropus agilis Hoek	26			26
Megamphopus cornutus Norman		1		1
Jassa ocia (Bate)	2	9		11
MYSIDACEA				
Siriella armata (H. Milne Edwards)		2	3	5
Siriella clausi G.O.Sars			1	1
Leptomysis lingvura (G.O.Sars)	1		3	4
Paramysis arenosa (G.O.Sars)	2		1	3
EUPHAUSIIACEA				
Euphausiid larvae			15	15

TABLE 1 (Continued)

Species		♂♂	♀♀	Sex Unknown	Total
DECAPODA					
Crangon crangon (L.)				54	54
Anapagurus hyndmanni (Bell)	zoea I			2	2
Pagurus bernhardus (L.)	zoea I			1	1
Galathea dispersa Bate	zoea I			2	2
Carcinus maenas (L.)	zoea I			5	5
Pirimela denticulata (Montagu)	zoea I			6	6

A small amount of non-crustacean material was also found in the sample. There was a medusa of Sarsia tubulosa (M.Sars), two specimens of the gastropod Nassarius reticulatus (L.), five polychaetes belonging to the genus Autolytus, and four specimens of the larvacean Oikopleura dioica Fol.

Discussion

A single night's work produced a collection of crustaceans in pristine condition. Most of the species could be regarded as common and could be expected to be found in the shallow sub-littoral all around the coast of Ireland. The following species appear to be new to the west coast of Ireland:- Parasterope muelleri (Skogsberg), Alteutha sarsi Monod, Tegastes clausi G.O.Sars, Parathalestris intermedia Gurney, P. irelandica Roe, and Bathyporeia nana Toulmond.

The females of Mychophilus roseus Hesse, which inhabit tunicates, may be found all along the western seaboard of Europe, but the males have only recently been described (Gotto et al., 1984). These males are attracted to light, and one specimen was found at Spiddal.

Little seems to be known about the sex ratios of marine crustaceans, and the following observations based on the data may be of interest. It can be seen that in some cases the males predominated; for example Temora longicornis (O.F. Müller), most of the cumaceans, most Bathyporeia spp. In other species the females predominated; for example, Isias clavipes Boeck, Pseudocalanus elongatus Boeck, Calanus helgolandicus (Claus), and Dexamine

thea Boeck. In yet a third group the sexes were about even; for example Harpacticus uniremis Krøyer, Dactylopodia vulgaris (G.O.Sars), Parathalestris clausi (Norman), Apherusa bispinosa (Bate), and Atylus swammerdami (H.Milne Edwards). Many of the species were taken in numbers which were too small to allow any definite conclusion.

Any assessment of sex ratios must be approached with extreme caution. For a start, we might postulate that the sex ratio of the populations in the wild would probably approach 1 : 1, but this may very well not be true for many species. Also, the sex ratio may vary throughout the year. Secondly, the sexes may have quite different behaviour patterns, which will be reflected in collecting bias. Thirdly, the sexes may vary in their attraction to light. In the amphipod Metaphoxus fultoni (T. Scott), not by the way taken at Spiddal, the male has large black eyes while the female has relatively small eyes. In Lough Ine, Co. Cork, the species has been taken frequently in light traps (Holmes, 1983), but it has also been observed that the males outnumber the females in the traps by about 50 : 1. However, samples of shell gravel collected by hand contained the sexes in approximately equal numbers, which indicates that the trap is being selective.

Nevertheless, these preliminary observations would seem to indicate a fruitful line of enquiry, and suggests species which might selectively be followed further.

Acknowledgements

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SOME INVERTEBRATES OF LOUGH ROE, CO. OFFALY: A RARE AND ENDANGERED BOGLAND HABITAT.

Julian D. Reynolds.

Introduction

Lough Roe (N 2630) lies in the eastern part of Clara Bog (Lough Roe Bog), a 665 ha raised bog bisected by a road running south from Clara, Co. Offaly. Lough Roe is the best known remaining Irish and Atlantic European example of a soak system lake (van Eck et al., 1984). It appears to be supplied from under the bog by a mineral spring, whose influence leads to localised scraw formation. The rather similar soak region of Pollagh Bog, Co. Offaly, was the last known native Irish habitat for Scheuchzeria palustris L. before that bog was drained and exploited (Moore, 1955). Apart from pools with a somewhat different hydrography on the western part of Clara Bog (Reynolds, in prep.), the only known soak pool remaining on other Irish raised bogs is a small area on Mouds Bog, Co. Kildare (N 7819).

The vegetation of Clara Bog has been described, but not published, by Schouten (1981), while some groups of invertebrates have been recorded (Higgins, 1984; Reynolds, 1984). The bog is listed by An Foras Forbartha (Anon., 1981) and considered a top priority for conservation by the National Peatlands Conservation Committee because of the scientific importance of its soak system (Mills, 1984). However, draining of the Eastern part, prior to exploitation, began in 1983. As Lough Roe is affected, this habitat may disappear or be much changed in the near future. This paper records some of the invertebrates found together in this unusual minerotrophic lake, an ensemble quite unlike that of acid pools on other raised bogs.

Lough Roe was visited on 29 April 1984, when it was learnt that a network of shallow drains was being inserted into the surrounding bog, and again on 13 December 1984, 25 January 1985 and 20 March 1985. The area was measured by pacing. The water, organisms and vegetation were sampled at the lake edge. Conductivity and pH were measured in the laboratory using ion sensitive electrodes (WPA Instruments) and bicarbonate alkalinity

estimated by acid titration. Biotal samples were sorted live and dipteran larvae reared to the adult where possible. Entomostracans were dissected where necessary, and mounted in polyvinyl lactophenol. Invertebrate specimens belonging to the species listed are deposited in the Zoology Department, Trinity College Dublin.

Results

The rectangular open-water area was estimated in April 1984 to be about 7m x 25m in area; it appeared smaller the following December, at 5m x 20m. The surface was frozen, except for the centre, in January 1985. Water samples from December and March indicated a pH of 5.85 to 6.00 (adjacent bog pools 4.25), but alkalinity (0.4 to 0.5 mg $CaCO_3$ per litre) and specific conductance (41.8 $\mu S\ cm^{-1}$ at $20^{o}C$) lay within bog pool ranges.

The open water is surrounded by a rectangle of floating scraw vegetation some 0.45 ha in extent, oriented east-west and at its closest point lying about 530 m east of the bog road. A smaller patch (0.35 ha) of similar vegetation without open water lies to the west, on the line of an old ditch linking Lough Roe to the roadside drains. The scraw flora around Lough Roe was dominated by Carex spp., Eriophorum and Typha species, intermingled with Cladium, Menyanthes, Hydrocotyle, Lemna minor L., Aulacomnium palustre (Hedw.) Schwaegr., Sphagnum palustre L. and S. recurvum P. Beauv., with Andromeda and bushes of Betula pubescens Ehrh. towards the drier edge.

The littoral-plankton community contained abundant desmids (Closterium lunula (Mull.) Nitzeh. ex Ralf and Micrasterias sol (Ehr.) Kutz.) with many Hydracarina and crustaceans; no free-swimming rotifers were seen. Forms characteristic of bog habitats include Acantholeberis curvirostris (O.F. Müller), Chydoris ovalis Kurz and Alona rustica Scott, while other chydorid crustaceans encountered are more typical of weedy pond habitats.

Among the larger invertebrates (Table 1), permanent aquatic forms such as Asellus aquaticus (L.), Polycelis tenuis and Sphaerium corneum (L.) suggest basic ions and a long-continued existence for this water body. The pond-like nature of the habitat is further indicated by Stylaria lacustris (L.),

Nepa cinerea (L.), and Hesperocorixa sahlbergi (Fieber), while coexisting forms more characteristic of acid moorland habitats, such as Hesperocorixa castanea (Thomson), Sympetrum scoticum (Donovan), Monopelopia tenuicalcar (Kieffer) and A. curvirostris (O.F. Müller) indicate the delicate interplay of minerotrophic and ombrotrophic influences in the soak lake.

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TABLE 1: INVERTEBRATES IDENTIFIED FROM LOUGH ROE, CLARA BOG, CO. OFFALY, ON 29 APRIL 1984 AND 13 DECEMBER 1984.

An indication of relative abundance in the samples is given as follows:- +++ abundant; ++ frequent; + occasional or single specimen.

TURBELLARIA:

++ Polycelis tenuis Ijima

OLIGOCHAETA:

++ Stylaria lacustris (L.)

LAMELLIBRANCHIA:

+ Sphaerium corneum (L.)

CRUSTACEA:

+++ Asellus aquaticus (L.)
+ Pleuroxus truncatus Muller
+++ Alona affinis Leydig
+ A. rustica T. Scott
+++ Alonella exigua (Lilljeborg)
++ A. excisa (Fischer)
+++ Chydorus sphaericus s.str. (O.F.Müller)
+ C. ovalis Kurz
++ Acantholeberis curvirostris (O.F.Müller)
+++ Cyclops viridis (Jurine)
+ C. fimbriatus s.str. (Fischer)

INSECTA:

++ Leptophlebia vespertina (L.)
++ Cloeon dipterum (L.)
++ Sympetrum scoticum (Donovan)
+ Libellula quadrimaculata L.
+ Nepa cinerea (L.)
+ Velia caprai Tamanini
+ Gerris odontogaster (Zetterstedt)

TABLE 1 (Continued)

+ G. lacustris (L.)
+ Naeogeus ruficeps (Thomson)
++ Hesperocorixa castanea (Thomson)
+ H. sahlbergi (Fieber)
+ Limnephilus stigma Curtis
+ Monopelopia tenuicalcar (Kieffer)
+ Gyrinus substriatus Stephens

ARACHNIDA:

++ Argyroneta aquatica (Clerck)

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A CHECKLIST OF IRISH DIXIDAE (DIPTERA).

P. Ashe

The earliest reference to the occurrence of the family Dixidae in Ireland is in a paper by Haliday (1833) in which five species are recorded i.e. Dixa nebulosa Meigen, D. maculata Meigen, D. aprilina Meigen, D. aestivalis Meigen and D. serotina (Meigen)(?) for the area around Holywood in Co. Down. Walker (1856) records four of these species as occurring in Ireland but excludes D. serotina which is queried in Haliday (1833). One species, D. aestivalis, was recorded in the Clare Island survey by Grimshaw (1912). Freeman (1950) records only two species from Ireland, D. nubilipennis Curtis and D. submaculata Edwards, and Beirne (1951) records the latter species only. Disney (1975) in his excellent key to all life stages records four species for Ireland i.e. Dixa dilatata Strobl, D. nubilipennis, D. submaculata Edwards and Dixella martini Peus. Until now the only species known to occur with certainty in Ireland are the four species mentioned in Disney (op. cit.)

The National Museum of Ireland contains a collection of pinned Irish Dixidae, including Haliday's specimens. All this material will be slide mounted in the near future and the results of this will be published separately.

All the new records in the present paper are based on recent material preserved in alcohol. In order to ensure positive identification, specimens were mounted on slides in Euparal. In the case of adult specimens the head, thorax (except wings) and abdomen were cleared in 10% KOH before mounting on slides. Many specimens were reared from mature larvae and the larval exuvia, pupal exuvia and adult were mounted on slides or preserved in alcohol. A representative collection (on slide and in alcohol) of the species seen and identified by me will be deposited in the National Museum of Ireland.

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CHECKLIST OF IRISH DIXIDAE (*= species new to Ireland)

Dixa dilatata Strobl
*D. nebulosa Meigen
D. nubilipennis Curtis
*D. puberula Loew
D. submaculata Edwards

*Dixella aestivalis Meigen
*D. amphibia De Geer
*D. autumnalis Meigen
*D. filicornis Edwards
D. martini Peus
*D. serotina Meigen

Nomenclature follows Disney (1975).

List of collectors and abbreviations used for collectors' names:- P. Ashe: PA; B. P. Beirne: BPB; Cave Research Group of Great Britain: CRGOGB; J. H. Cole: JHC; R. H. L. Disney: RHLD; F. W. Edwards: FWE; G. Morgan: GM; J. P. O'Connor: JPOC; M. A. O;Connor: MAOC; J. Reynolds: JR; R. I. Vane-Wright: RIVW.

Records are given by county followed by the date, locality, grid references or vice-county and collector.

Dixa dilatata Strobl

Fermanagh: 17 July 1966, Boho Cave, H 127445, CRGOGB.
Kerry: 25-27 May 1929, Killarney, H2, FWE.
Laois: 6 June 1970, Slieve Bloom Mts, N 295045, RIVW.

Dixa nebulosa Meigen

Kerry: 29 July - 8 August 1978, River Flesk, Killarney, V 987900, PA.
(reared from larva collected on 29 July, adult emerged 8 August).

Dixa nubilipennis Curtis

Cork: 23 March 1984, ditch at Geragh Woods near Macroom, W 297704, PA.
Galway: 6 April 1984, ditch near Moycullen, M 221329, PA.
Kerry: 25-27 May 1929, Killarney, H2, FWE.
: 2 July 1943, Killarney, H2, BPB.
Wicklow: 19 March 1983, Knocksink Wood, Enniskerry, O 216182, PA.

Dixa puberula Loew

Cork: 22 December 1980, Long Bridge, River Bandon, Dunmanaway, W 240529, GM.

Kerry: 15 August 1983, stream at Galway's Bridge, near Killarney, V 916803, PA (larvae).
Sligo: 31 July 1983, stream near Toremore Mt., G 727439, PA.
Tipperary: 24 March 1984, at 700 ft in stream arising from Lough Muskry near Cahir, R 924275, GM.
Wicklow: 5 March 1983, Bellevue Woods, Glen of the Downs, O 262112, PA.

Dixa submaculata Edwards

Dublin: 27 March 1983, Bohernabreena, near Tallagh, O 094223, PA.
Kerry: 25-27 May 1929, Killarney, H2, FWE.
: 5 August 1940, Gortroc, Cromaglan, Killarney, H2, BPB.

Dixella aestivalis Meigen

Clare: 4 September 1983, river near Dromore Estate, Corrofin, R 358876, PA.
Galway: 3 September 1983, turlough near Garryland Wood, Gort, M 416037, PA.
Kildare: 13 May 1984, pond near Kilgowan, N 840028, PA.
Monaghan: 19 June 1979, Nuremore Lake, Carrickmacross, H 85-03-, JHC.
Offaly: 14 June 1983, roadside ditch at Mongan Bog near Clonmacnoise, N 028302, PA.
Wicklow: 16 August 1981, Russelstown Park, N 964109, MAOC and JPOC.

Dixella amphibia De Geer

Cavan: 15 April 1984, alder marsh near Virginia, N 586881, JPOC and MAOC (one mature larva).
Galway: 7 April 1984, roadside pond near Lough Agraffard, M 066423, PA.
Offaly: 14 June 1983, roadside ditch at Mongan bog near Clonmacnoise, N 028302, PA.
: 30 April 1984, Clara Bog, N 256295, PA.

Dixella autumnalis Meigen

Galway: 1975, Church Lough, Inishbofin, L 5--6--, RHLD.
Kildare: 12 April 1984, Pollardstown Fen, N 772155, PA.

Dixella filicornis Edwards

Laois: 23 April 1984, The Derries, near Ballybrittas, N 587051, PA.

Dixella martini Peus

Cork: 3 June 1964, Clear Is., V 9--2--, RHLD.
: 24 March 1984, ditch near Riverstick, W 664587, PA.
Galway: 6 April 1984, ditch near Moycullen, M 221329, PA.
Offaly: 14 June 1983, roadside ditch at Mongan Bog near Clonmacnoise, N 028302, PA.

Dixella serotina Meigen

Dublin: 20-24 June 1984, Ballybetagh Bog, O 201210, JR.
Offaly: 14 June 1983, roadside ditch at Mongan Bog, Clonmacnoise, N 028302, PA.

Eleven of the fourteen British species are now known to occur in Ireland. The three species which are not yet recorded from Ireland but which occur in Britain are Dixa maculata Meigen, Dixella attica Pandazis and Dixella obscura Loew. There is no reason why these three species should not occur in Ireland and with a more intensive collecting programme it is likely that these species will be discovered.

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CLADOCERA FROM BURREN TURLOUGHS AT MULLAGH MORE, CO. CLARE.

Julian D. Reynolds

Introduction

The area of scarp, woodland and turloughs in the south-eastern Burren region is rated a site of international importance by An Foras Forbartha (Anon., 1981), yet there is little published information on its fauna. From 1977 to 1980, ecological studies were made on the fish and invertebrate communities of a group of astatic ponds and turloughs south of Mullagh More hill. Littoral and openwater collections of Entomostraca were made monthly in Lough Gealain (Lough Girraun) (R 3195), a shallow 17 ha lake with a central flooded doline, 16 m deep; Knockaunroe (R 3194), a 30 ha temporary water body, and the Trinity College Fen (R 3295), a seasonally flooded fen in a rock basin under one ha (Reynolds, 1982).

Cladocerans identified from these collections and from the stomachs of 390 juvenile sticklebacks (Gasterosteus aculeatus L.) are listed here. Most forms from fish guts were well preserved but some more delicate Moinidae and Daphniidae could not be identified to species. All specimens were mounted in polyvinyl lactophenol; slides are preserved in the Zoology Department, Trinity College Dublin. Forms were identified using the keys of Amoros (1984) and Scourfield and Harding (1966).

Discussion

There has been little work on distribution of Irish cladocerans since the early 1900s (Reynolds, 1964 MS). Kane (1903) lists some 23 species from Co. Clare, nine of these from shallow lakes and turloughs at Kilmacduagh, Ballyvaughan and other Burren localities. Two were not re-found in this study (Scapholeberis mucronata (O.F.Müller) and Disparalona rostrata (Koch)); the others, all Chydoridae, are indicated as such on the check list (Table 1).

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TABLE 1: CHECK LIST AND SPECIES DISTRIBUTION

FAMILY	SPECIES	PONDS	STATUS
Bosminidae:	Bosmina longirostris (O.F.Müller)	LG K Fen	(NR)
Daphniidae:	Ceriodaphnia quadrangula (O.F.Müller)	K Fen	(NR)
	Simocephalus vetulus (O.F.Müller)	LG K Fen	
Sididae:	Sida crystallina (O.F.Müller)	LG K	
	Latona setifera (O.F.Müller)	LG K	(NR)
Macrothricidae:	Ilyocryptus sordidus (Liéven)	LG K	
Chydoridae:	Eurycercus lamellatus (O.F.Müller)	LG K Fen	
	Chydorus sphaericus (O.F.Müller)	LG K Fen	
	Graptoleberis testudinaria (Fischer)	LG K	(Kane)
	Pleuroxus truncatus (O.F.Müller)	LG K Fen	
	P. trigonellus (O.F.Müller)	LG K	(Kane)
	Rhynchotalona falcata (Sars)	LG K	(NR)
	Alonella nana (Baird)	LG K Fen	(Kane)
	A. excisa (Fischer)	LG K Fen	(Kane)
	Alona guttata Sars	LG K	(Kane)
	A. costata Sars	LG K Fen	
	A. quadrangularis (O.F.Müller)	K	(Kane)
	Biapertura affinis (Leydig)	LG K Fen	(NR)
	Acroperus harpae Baird	LG K Fen	(Kane)
	A. elongatus (Sars)	LG K Fen	(NR)

Abbreviations:- LG: Lough Gealain; K: Knockaunroe; Fen: Trinity College Fen; (NR): new county record; (Kane): recorded as a turlough species in Kane (1903).

Of the 20 species listed, a few show no clear habitat preferences (e.g. Simocephalus vetulus, (O.F.Müller), Chydorus sphaericus (O.F.Müller), Alonella species and Biapertura affinis (Leydig) but most are common in eutrophic weedy habitats (Amoros, 1984). However, Byrne (1981) has characterised the nutrient status of these ponds as oligotrophic, although high in calcium. Forms most characteristic of oligotrophic habitats (often lime-poor) include Ceriodaphnia quadrangula (O.F.Müller), Latona setifera (O.F.Müller) and Acroperus elongatus (Sars); however, all were seen only occasionally.

Apart from Bosmina longirostris (O.F.Müller) all recorded forms are littoral-benthic in habit, as would be expected for these shallow, astatic waters. The largest species list was recorded from Knockaunroe, the most typical turlough of the three, which may dry out completely several times in the year. It is fed by a substantial underground stream from Lough Gealain, which may be the source of its recolonisation for some invertebrates but perhaps not for most cladocerans. Praeger (1950) stated that the abrupt changes of water level to which turlough animals are subjected would not seem to be favourable for the presence of any varied or characteristic fauna. For cladocerans at any rate, this may not be the case.

Acknowledgements

I would like to thank Roger Byrne for assistance with some field collections, and the National Parks Branch of the Office of Public Works for assistance with field expenses.

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WORK OF THE EUROPEAN INVERTEBRATE SURVEY COMMITTEE.

Martin C. D. Speight

The European Invertebrate Survey Committee (EIS) was set up 17 years ago, to promote and co-ordinate international effort in Europe aimed at the survey and mapping of invertebrate species. For most of its seventeen-year history its efforts have been, of necessity, focused primarily in two areas:

a) encouraging the setting up of national data banks in each European country, to deal with invertebrate biological records,
b) establishment of an international accord on the use of the UTM grid and the 50 km. square unit as the basis for mapping invertebrates, internationally.

These two objectives have, by and large, been achieved, and maps showing the international distribution of particular invertebrate species are beginning to appear. At its meeting in Gembloux, September 1985, the EIS took the decision to embark upon investigations of other aspects of international survey work involving invertebrates.

International compatibility/standardisation of invertebrate biological records data

A study, co-ordinated by Prof. Dr. Reichl (Austria), is being conducted to assess the feasibility of drawing up an agreed format, to be recommended for use internationally, for the recording of basic data to be filed as part of biological records of invertebrates. This study would attempt to identify those components of biological records that are common to most systems of recording invertebrates and then seek to develop a system of presentation of these components that would maximise comparability of data, internationally. As part of the study, the results of the Council of Europe's classification of European ecosystems by vegetation type would be examined, to see whether at any level this classification system might usefully be adopted for standardising habitat data incorporated into invertebrate distribution records.

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Survey of internationally important sites

Certain European nature reserves are recognised by the Council of Europe as being of international importance. It is proposed that these reserves, the "Biogenetic Network" reserves, be used as the basis for choosing a small number of sites of recognised international importance that might be given special attention in survey work carried out by EIS/CIE/EEW members. The objective would be to identify key sites which should be sampled as part of any international survey work involving invertebrates (i.e. an internationally known network of sampling stations)and at the same time to increase the knowledge of the invertebrate fauna of these internationally important sites. Dr. Kine (Belgium) is co-ordinating this study.

Survey of bio-indicators

A study, co-ordinated by Dr. Speight (Ireland) is to be conducted, of taxonomic groups of invertebrates that are of potential value as bio-indicators in the field of nature conservation. The objective would be to identify and list those invertebrate taxonomic groups with the greatest bio-indicator potential, as a step towards selection of invertebrate groups for which the setting up of international data banks of biological records is of the highest priority.

Further information about the EIS and its activities can be obtained from M. Marc Meyer, Secrétaire Général EIS/CIE/EEW, Musée d'Histoire Naturelle, Marché-aux Poissons, L-2345 LUXEMBOURG.

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FIELD NOTES

FIELD EXCURSION TO THE DERRY HILLS, CO. LAOIS - 6 JULY 1985.

Peter J. Foss

Six members and friends attended this field meeting to record the flora present on the series of glacial esker ridges, surrounded by raised bog and fenland known as the Derry Hills.

The Derry Hills (N 260125) are a group of low esker ridges (100 m) composed of calcareous glacial till, situated along the north-western edge of the Slieve Bloom mountains in Co. Laois. The hills are located in the base of a large depression on either side of the main Kinnitty to Tullamore road. To the east of the road, where the esker ridge is larger, water percolating through the glacial material has resulted in the formation of an area of calcium rich springs and the development of an alkaline fen. This area is dominated by Schoenus nigricans, and contains such species as Pinguicula vulgaris, Cirsium dissectum and Ophrys insectifera. Beyond the fen a cutover raised bog occurs. A similar fen to the west of the road has been seriously damaged by drainage activity.

The flora of the area has been recorded by Prof. D. A. Webb who visited this site on a number of occasions (see Webb 1950, 1957 & 1958). During these visits he recorded new vice-county records for Sesleria caerulea, Vicia orobus and O. insectifera, and commented that "Few spots in Ireland can have such a rich and varied flora" (Webb 1958). The importance of the Derry Hills was subsequently recognised by An Foras Forbartha, who established the site as an area of regional scientific importance (Anon, 1981).

A total of 205 species were recorded during the outing of the Irish Biogeographical Society (see Table 1). This list contains a rich selection of both calcicole and calcifuge species, reflecting the habitat diversity present in the area.

Notable among the species recorded was Vicia sylvatica which was flowering profusely. This vetch occurred to the west of the road, on the north west slope of a sparsely wooded esker and in a small abandoned gravel pit on the north side of the same esker. The plant was climbing among Salix

caprea, Prunus spinosa, Crataegus monogyna, Rubus fruticosus agg. and Ulex europaeus bushes.

In a larger gravel pit to the east of the Tullamore road, two small colonies of Acinos arvensis (basil-thyme) were found growing on the floor of the quarry. This species was last recorded in Laois by Praeger in 1896 from 3 stations near Port Laoise (Praeger, 1901).

The other rare species previously recorded by Webb (op. cit.) were also relocated. Sesleria caerulea was growing in considerable quantity on the edge of the gravel pit to the east of the road, near the Acinos colonies. O. insectifera grew in the intact Schoenus fen at the base of this esker ridge. V. orobus grew on the flanks of the esker hill to the west of the road which also contained V. sylvatica.

Regrettably the area has been badly damaged recently, by woodland clearance, burning and an extensive series of drains encircling the hills. Hopefully, further damage to the site will be prevented, and reversed where possible, by the government agencies responsible for the protection of our sites of scientific importance. The full list of species found is presented in Table 1 to allow any further changes in the site status to be adequately assessed.

Acknowledgements

I would like to thank the Society members who attended the trip, and helped to find the rare species.

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TABLE 1: TAXA RECORDED FROM THE DERRY HILLS, CO. LAOIS.

Nomenclature for higher plants follows Scannell and Synnott (1972)

Acer pseudoplatanus
Achillea millefolium
Acinos arvensis
Aesculus hippocastanum
Agrostis canina
Agrostis stolonifera
Alnus glutinosa
Anagallis arvensis
Andromeda polifolia
Anenome nemorosa
Angelica sylvestris
Antennaria dioica
Anthemis nobilis
Anthoxanthum odoratum
Anthriscus sylvestris
Apium nodiflorum
Aquilegia vulgaris
Arctium minus
Arrhenatherum elatius
Bellis perennis
Betula pubescens
Blackstonia perfoliata
Brachypodium sylvaticum
Brassica rapa
Briza media
Callitriche stagnalis
Calluna vulgaris
Caltha palustris

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TABLE 1 (CONTINUED)

Capsella bursa-pastoris
Cardamine pratensis
Carex binervis
Carex curta
Carex demissa
Carex flacca
Carex lasiocarpa
Carex lepidocarpa
Carex nigra
Carex panicea
Carex pilulifera
Carex pulicaris
Carex rostrata
Carex sylvatica
Carlina vulgaris
Catapodium rigidum
Centaurea nigra
Centaurium erythraea
Cerastium diffusum
Cerastium fontanum
Chenopodium album
Cirsium arvense
Cirsium dissectum
Cirsium palustre
Conopodium majus
Corylus avellana
Crataegus monogyna
Cynosurus cristatus
Dactylis glomerata
Dactylorhiza maculata
Daucus carota
Digitalis purpurea
Drosera anglica
Drosera rotundifolia
Dryopteris aemula
Dryopteris dilatata
Epilobium angustifolium
Epilobium hirsutum
Equisetum arvense
Equisetum palustre
Erica tetralix
Eriophorum angustifolium
Eriophorum vaginatum
Euphrasia spp.
Festuca rubra
Filipendula ulmaria
Fragaria vesca
Fraxinus excelsior
Fumaria officinalis
Galium aparine
Galium palustre
Galium saxatile
Galium verum
Geranium robertianum
Glechoma hederacea
Glyceria fluitans
Gymnadenia conopsea
Hedera helix
Helictotrichon pubescens
Heracleum sphondylium
Holcus lanatus
Hydrocotyle vulgaris
Hypericum perforatum
Hypericum pulchrum
Hypochoeris radicata
Ilex aquifolium
Juncus articulatus
Juncus bulbosus
Juncus effusus
Juncus inflexus

TABLE 1 (CONTINUED)

Knautia arvensis
Lapsana communis
Lathyrus montanus
Lathyrus pratensis
Leontodon autumnalis
Leucanthemum vulgare
Linum catharticum
Listera ovata
Lonicera periclymenum
Lotus corniculatus
Luzula campestris
Luzula multiflora
Lythrum salicaria
Malva sylvestris
Medicago lupulina
Melampyrum pratense
Mentha aquatica
Menyanthes trifoliata
Molinia caerulea
Myosotis discolor
Myrica gale
Narthecium ossifragum
Nasturtium officinale
Ophrys apifera
Ophrys insectifera
Orchis mascula
Orobanche minor
Papaver rhoeas
Pedicularis sylvatica
Phragmites australis
Pilosella officinarum
Pinguicula vulgaris
Pinus contorta
Plantago lanceolata
Plantago major
Platanthera bifolia
Poa annua
Poa pratensis
Polygala vulgaris
Potamogeton natans
Potamogeton polygonifolius
Potentilla anserina
Potentilla erecta
Potentilla palustris
Potentilla sterilis
Primula veris
Primula vulgaris
Prunella vulgaris
Prunus sp.
Prunus spinosa
Pteridium aquilinum
Quercus petraea
Ranunculus acris
Ranunculus flammula
Ranunculus repens
Rhinanthus minor agg.
Rosa arvensis
Rosa canina
Rosa pimpinellifolia
Rubus fruticosus agg.
Rumex acetosa
Rumex acetosella
Rumex sanguineus
Sagina procumbens
Salix atrocinerea
Salix aurita
Salix caprea
Sambucus niger
Schoenus nigricans
Scirpus cespitosus

TABLE 1 (CONTINUED)

Selaginella selaginoides
Senecio jacobea
Senecio sylvaticus
Senecio vulgaris
Sesleria caerulea
Sherardia arvensis
Sieglingia decumbens
Sisymbrium officinale
Solidago virgaurea
Sonchus asper
Sonchus oleraceus
Stellaria graminea
Stellaria media
Succisa pratensis
Taraxacum officinale agg.
Teucrium scorodonia
Trifolium dubium
Trifolium pratense
Trifolium repens
Triglochin palustris
Tussilago farfara
Typha latifolia
Ulex europaeus
Urtica dioica
Vaccinium myrtillus
Veronica beccabunga
Veronica chamaedrys
Veronica officinalis
Veronica persica
Veronica serpyllifolia
Viburnum opulus
Vicia cracca
Vicia orobus
Vicia sativa
Vicia sepium
Vicia sylvatica
Viola riviniana

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A FUNGAL FORAY TO KNOCKREA WOOD, CO. WICKLOW (O 1916), 21 SEPTEMBER 1985.

Anthony McNally, and Mary C. Heslin.

The autumnal fungal foray has become a regular item on the calendar of the Irish Biogeographical Society. Apart from the serious mycologist, the event has regularly attracted those with more predatory instincts from amongst the ranks of the committed "mushroom eaters" (not that both categories are mutually exclusive!). Progress of the party has traditionally been leisurely, with members being tempted by the autumn harvest of blackberries to browse the hedgerows en route.

Fourteen people attended this years outing and it was decided to yield to the epicurean tendencies of the participants. A selection of recipes were distributed for the materials most likely to be encountered. Unfortunately, the cool, wet summer resulted in a dearth of fruits and fungi alike. Although twenty seven species of fungi were eventually collected (Table 1), only Cantherellus cibarius was found in any quantity. However, the outing to this site on the same date in 1984 yielded species such as Agaricus arvensis, Laccaria amethystea, Lepiota procera, L. rhacodes, Psilocybe semilanceata, Mutinus caninus and Suillus grevillei in profusion. Perhaps a similar harvest may have been reaped in 1985 had the meeting taken place two weeks later.

The meagre fungal collection was supplemented by a variety of foodstuffs including blackberries, elderberries, haws, burdock roots, mint and yarrow for the production of alcoholic beverages, jams, jellies, teas and ices.

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TABLE 1: A LIST OF FUNGI COLLECTED AT KNOCKREA WOOD, CO. WICKLOW, 21 SEPTEMBER, 1985.
Nomenclature follows Philips (1981)

AGARICALES

Agaricus arvensis
Agaricus silvaticus
Amanita rubescens
Boletus edulis
Clitocybe infundibuliformis
Clitocybe sp.
Coprinus micaceus
Hygrocybe conica
Hygrocybe nivea
Hypholoma fasciculare
Laccaria laccata
Lactarius rufus
Lepiota rhacodes
Marasmius oreades
Mycena pura
Panaeolus rickenii
Paxillus involutus
Stropharia semiglobata
Tricholomopsis rutilans

APHYLLOPHORALES

Cantharellus cibarius
Clavaria rugosa
Polyporus versicolor
Tryomyces stipticus

GASTEROMYCETALES

Phallus impudicus

HELOTIALES

Bulgaria inquinans

SPHAERIALES

Xylaria hypoxylon

TREMELLALES

Auricularia auricula-judae

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ANNOUNCEMENT

IRISH GRID/UTM GRID CONVERSION OVERLAYS FOR BIOLOGICAL RECORDING

The Irish Biogeographical Society has a stock of transparent overlays of Ireland, marked out with 50 km squares on the UTM grid (as shown in fig. 1), together with undersheets showing Ireland on the same scale and marked out with 10 km squares on the Irish National grid. Using these two sheets together, most 10 km Irish National grid references can be converted to their 50 km UTM equivalents, as used internationally in Europe for biological recording purposes. Any paid-up member of the Irish Biogeographical Society can obtain a copy of the conversion set on request, by writing to the Secretary, Dr. K. Heslin, at 3 Dundela Avenue, Sandycove, Co. Dublin. Supplies are limited, so only one copy of the conversion set can be issued to each member and copies are available only to paid-up members.

M. C. D. Speight.

OVERLEAF

FIGURE 1: Ireland, map showing the code used internationally, in biological records work, to provide a unique label for each European 100 km square (letters) and constituent 50 km squares (numbers), for plotting distribution data on the UTM grid using the 50 km square as plotting unit.

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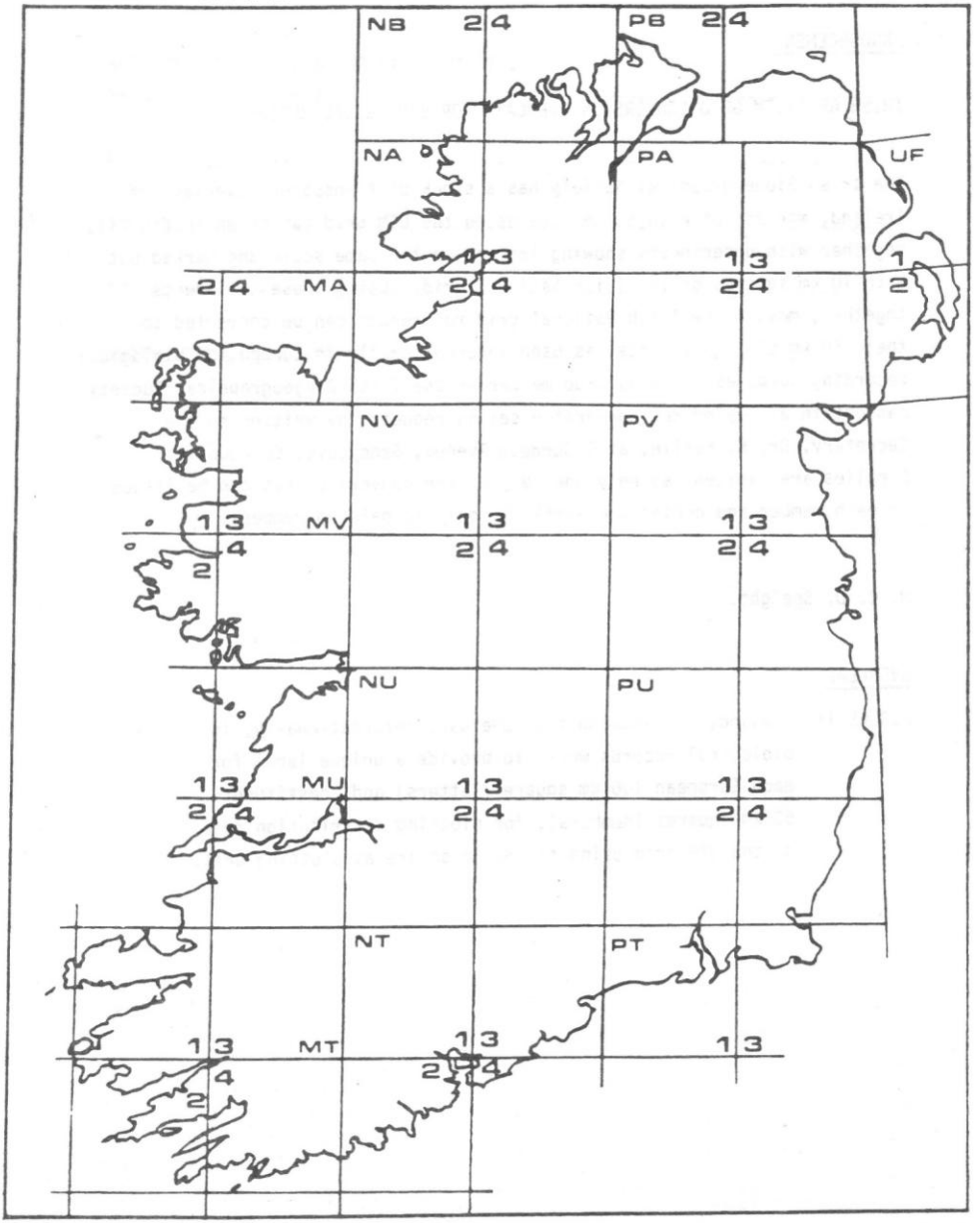
FIGURE 1: UTM Grid



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Review

COUNCIL OF EUROPE: 2ND COLLOQUY ON COMPUTER APPLICATIONS IN THE FIELD OF NATURE CONSERVATION. CATALOGUE OF DATA BANKS IN THE FIELD OF NATURE CONSERVATION. STRASBOURG, 1985.

This compilation gives the results of a survey carried out by the Environment and Resources Division of the Council of Europe to ascertain the number of data banks held by the participating member states. Seventy data banks are listed under name of country, geographic coverage, thematic coverage and managing authority in a summary table at the beginning of the document. This is followed by descriptions of each of the data bases covering number of entries, area dealt with, list of stored attributes, hardware and software used and ease of access to data. The use of biological data bases in Ireland is still in its infancy, as can be seen from the dearth of entries for the country. The Irish Biological Records Centre is listed as the managing authority for Ireland but the low information content of the data base is evident. However, this will no doubt improve with the integration of plant records into the system and increased co-operation with the Forest and Wildlife Service, as is the documented aim of the I.B.R.C.

This document summarises much useful information for recorders and those interested can obtain copies of the compilation from:

Secretariat General,
Directorate of Environment and Local Authorities,
Council of Europe,
BP 431 R6,
67006 Strasbourg,
FRANCE.

T. G. F. Curtis.

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INSTRUCTIONS TO CONTRIBUTORS.

1. Manuscripts should follow the format of articles in Bulletin No. 9.
2. Manuscripts should be submitted as typed copy on A4 paper, using double-spacing and 2.5 cm (1 inch) margins.
3. It helps if the copy is clean and not embellished with a mass of super-imposed corrections.
4. Figures should be submitted in a size suitable for reduction to A5 without any loss of detail.
5. Records: please ensure that, at minimum, the following information is incorporated in each record included in a manuscript:-
   a) latin name of organism,
   b) statement of reference work used as the source of nomenclature employed in the text. The describer's name should be also given when a zoological species is first mentioned in the text,
   c) locality details including at least a four figure Irish Grid reference (e.g. M 0978), county, vice-county number and some ecological data about the collection site, plus date of capture,
   d) collector's name and determiner's name (where different from collector's name), and
   e) altitude data should be included where relevant.
6. Manuscripts should be submitted to the Editor, Dr. J. P. O'Connor, at the following address:- National Museum of Ireland, Kildare Street, Dublin 2, IRELAND.

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